

# FY 2012 Secretary of Defense Environmental Awards

## FORT HOOD

### Sustainability, Non-Industrial Installation

#### JUDGING CRITERIA



Program Management



Orientation to Mission



Technical Merit



Transferability



Stakeholder Interaction



Program Impact

#### INTRODUCTION

Fort Hood is the home of III Corps Headquarters, 1st Cavalry Division, 1st Army Division West, 13 Sustainment Command (Expeditionary), 3rd Armored Cavalry Regiment and several separate brigades along with a host of brigade and battalion-sized tenant units and organizations. The installation has 340 square miles of land and supports a daily on-post population of 39,712 military, 18,420 family members, 6,437 civilians, and 15,071 contractor personnel and others. Fort Hood's environmental program is executed by the Environmental Division of the Directorate of Public Works (DPW). The environmental staff focuses their efforts on air quality, energy management, pollution prevention, recycling, water quality and sustainability which the installation's environmental management system (EMS) has determined are the environmental quality aspects that most affect the mission and quality of life of the installation's Soldiers and other inhabitants.

#### BACKGROUND

The Environmental Division works diligently to sustain a robust EMS that supports the installation's elevated operations tempo and mission priorities. Fort Hood's environmental strategy is to use a systematic approach to identify and manage significant impacts on the environment that can occur as a result of its activities. EMS helps Soldiers, civilians and contractors identify environmental vulnerabilities, document procedures in place and examine how to improve processes related to the environment. Fort Hood's EMS Coordinator conducts annual internal audits and annual aspect reviews of civilian, contractor and military activities. EMS has positively impacted training and operations and has proven beneficial as a performance driven tool. Each year, approximately 20 activities are interviewed and evaluated on their EMS conformance and awareness of the installation's environmental priorities and actions. The combination of the installation's Environmental Compliance Assessment Team (ECAT) process and internal audits focus on mission accomplishment.

In April 2011, Fort Hood was selected as a Net Zero Waste installation to reduce its waste and eliminate landfill use by 2020. The EMS objectives were then rewritten to support this initiative. The objectives include four phases as part of the installation's long-term sustainability goals:

- Phase 1 (2011-2012) Plan & Organize, 45 % Diversion Goal
- Phase 2 (2012-2015) Initial Implementation, 60 % Diversion Goal
- Phase 3 (2015-2018) Assess & Adjust, 75 % Diversion Goal
- Phase 4 (2018-2020) Full Implementation, 85 % Diversion Goal

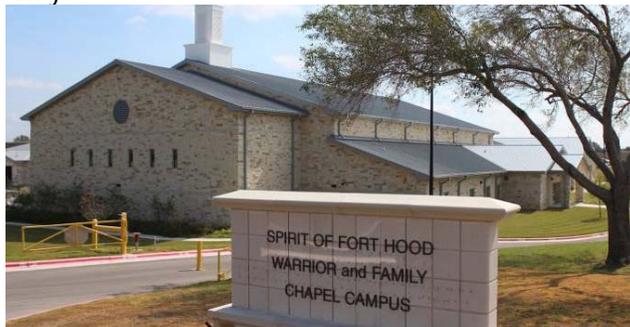


*"If we can do our part, we can set examples and demonstrate that we can be a sustainable installation by 2020. Net Zero is our project within the Department of Defense and for us to do our little piece of the pie and make our part of the world better. It's important people understand about the environment, conservation and recycling because our children and grandchildren's future rest on the decisions we make today."*  
- Lt. Gen. Mark A. Milley,  
commander of III Corps and Fort Hood

***Balancing the environment and mission.***

## LIVABLE COMMUNITIES & GREEN BUILDINGS

 **Army's first LEED Gold chapel:** Fort Hood built the Army's first LEED Gold certified chapel. The 40,000-square-foot Spirit of Fort Hood Warrior and Family Chapel Campus boasts a sanctuary that seats 600 people, but also low-flow toilets, sinks and waterless urinals. The chapel earned points for everything from efficient lighting, electrical, and heating, ventilation and air conditioning systems that will help cut its energy costs by 31 percent to low-flow toilets, low-flow sinks and waterless urinals that reduce potable water use by 53 percent. More than 85 percent of the construction waste was diverted from the landfill. And 27 percent of the building materials used in the chapel's construction was from recycled materials. As part of the second phase, the Chaplain Family Life Training Center will be constructed. A multi-purpose center, which completes the second phase, will include a gymnasium and an arts and craft center. Both centers will be Silver certified. When completed in the spring, the more than 70,000-square-foot chapel complex will be the largest one of its kind in the Army.



*The Army's first LEED Gold certified chapel. Photo by Christine Luciano.*

Lessons learned from Fort Hood's first Gold certified facility will help future green building on the installation and can be transferred to other military installations.



 **Largest Leadership in Energy and Environmental Design (LEED) Silver community in Texas:** Since FY08, all military vertical building construction projects have been built to achieve the Silver level of LEED-NC. Horizontal construction, such as ranges, roads and airfield, will continue to incorporate sustainable design and development features to the maximum extent possible. One of the LEED-certified accomplishments includes the largest LEED Silver certified community in Texas with 232 homes in Patton Park. With LEED Silver certified homes, a commitment to CFL light bulb use, a recycling program, and an educational sustainability program, Fort Hood Family

Housing is not only the premiere place for Soldiers and their Families; it is also a sustainable community.

**National Environmental Policy Act:** The NEPA Program at Fort Hood is the foundation under which sustainable principles are introduced, explained and agreed upon by proponents and decision-makers alike. The NEPA process itself is one of reviewing the past, present and foreseeable future impacts to the human and natural environments enabling any decision-maker and the public to look at comprehensive and reasonable alternatives to actions the Army may take. These actions not only include the construction of facilities, but the movement of troops and the overall impacts before, during and after a decision has been made. Fort Hood's NEPA program doesn't stop at construction of a facility, it considers the use of the facility and the total lifecycle cost. The NEPA program examines comprehensively the socioeconomic impacts on human health and the natural environment; ensuring that a broad spectrum sustainable approach is taken. Whether it's the way a building is built or analysis of its location and impacts on resources afterward or how many troops can train at an installation and how that will affect the local community, Fort Hood's NEPA process always assists in guiding decision-makers by showing them all the options for their projects.



## COMPLIANCE WITH EXECUTIVE ORDER 13514

 DPW and Directorate of Family and Morale, Welfare Recreation (DFMWR) worked together on an alternative for the installation's golf course irrigation system that pumps non-potable water from a small lake near the golf complex into the golf course's irrigation pond. In FY09, the water consumption was metered in accordance with Army guidance, and the bill increased from \$100,000 to \$291,000 annually. Executive Order (E.O.) 13423-Strengthening Federal Environmental, Energy, and Transportation Management mandated 2 percent per year reduction in potable water use as an Army installation sustainability initiative. Water use for irrigation of the golf course typically makes up about 5% of the total potable water use of Fort Hood. Since the Installation is required to reduce potable water consumption per E.O. 13154, this project will help meet that goal. This system reduces the cost to DFMWR to irrigate the golf course by replacing treated, potable water with raw surface water. Contingent on rainfall, the system has the capability of providing 100% of the irrigation needs. This project has an expected payback of 3-4 years, and has pumped over 37 million gallons of water. In May 2012, DPW received the Landfill

Lake Dam Preliminary Engineering Report on the feasibility of raising the water level in this lake. The report concluded that it is feasible to raise the lake level by 10 feet. As a result, an additional 121 million gallons of water would potentially be available for irrigation at the golf course. DPW is evaluating the various options discussed in the report for possible future execution.



## **MATERIAL MANAGEMENT**

 **Material Substitution with low VOC and Waterborne Paints:** The Environmental Division identified alternatives to replace 1.8-3.5 volatile organic compounds (VOC) content paints with low VOC and waterborne paints to reduce emissions and allow Fort Hood to become a synthetic minor source for hazardous air pollutants (HAPS). The Directorate of Logistics paint booths implemented the use of Type IV, 1.0 VOC, HAPS free, Chemical Agent Resistant Coating (CARC) at the beginning of the year. Between January and September 30, 2012 the combined use of the 1.0 VOC Tan 686A paint in the four booths was 235.75 gallons. In addition the four booths have used 2,529.5 gallons of 1.5 VOC, HAPS Free, Tan 686A. For the same time period in 2011 the four booths used 2049.02 gallons of 1.5 VOC, HAPS Free, Tan 686A. Consumption went up in 2012, however, VOC emissions from all surface coating activities was approximately five tons while total HAP emissions were 0.9 tons in 2011. The use of these HAPs free paints will help with efforts to produce a lower VOC and HAP emission rate for 2012 for all painting activities.



 **Environmental Corner:** Successful pollution prevention (P2) projects are collocated in an area of the installation referred to as the Environmental Corner. A mobile kitchen trailer/compact kitchen wash bay, tanker purge facility and JP-8/oil/anti-freeze recycle center are some of the P2 projects in the corner. Having these facilities centralized, helps monitor for pollution prevention and waste reduction.

**Mobile Kitchen Trailer/Compact Kitchen Wash Bay:** The mobile kitchen trailer (MKT)/ compact kitchen (CK) cleaning facility facilitates easier cleaning of the tactical kitchen trailers compared to the previous process. This wash bay provides approved detergents, high-pressure hot water, and a closed loop pretreatment system with no water entering the sanitary sewer or storm water systems. During FY11 and FY12, the MKT/CK was used 185 times and prevented approximately 1,400,000 gallons of polluted water from entering the sanitary sewer.

**Tanker Purge Facility:** Fort Hood's purge facility recycles all the water in a closed loop system and the water is reused many times before flushed and filtered into another holding tank. There, the fuel residue is skimmed off and recycled so the water and fuel can both be reused. During FY11 and FY12, the purge facility was used 299 times and saved approximately 1,501 Soldier man hours and 3,465,000 gallons of water from being discharged into the sanitary sewer.

**JP-8/oil/antifreeze Recycle Center:** Fort Hood facilities have collection tanks, ranging from 280 to 2,000 gallons, for used oil, antifreeze and off-specification JP8 fuel. These products are collected on a regular basis by the P2 services truck drivers and are cleaned and stored at the Environmental Corner to be sold for recycling. These collection programs prevent petroleum, oil and lubricant products from entering into the environment and allow for the reclamation of potable water by centrifuging these products at the Environmental Corner. During FY11 and FY12, the JP-8/oil/antifreeze recycle center collected 140,309 gallons of JP-8 fuel and 245,011 gallons of used oil, generating \$252,770, which avoided disposal costs while recycling valuable resources. Fort Hood also sent 43,038 gallons of antifreeze for recycling instead of disposal as a hazardous waste.



## **COMPLIANCE WITH EXECUTIVE ORDER 13423**

 **Hazardous Material Management:** Hazardous Material Authorization Request is a process the Environmental Division uses to approve, disapprove or provide viable substitutes for hazardous material request. It allows the environmental staff to capture material requests that have not been previously approved, hazardous to the environment that may have effects on human health. Once a request is submitted, the material safety data sheet (MSDS) is thoroughly reviewed for hazardous constituents, VOCs, safety and health recommendations, size and the process in which the material will be used. Some requests may require other respected programs expertise such as air, water, safety or industrial hygiene to assist in eliminating environmental and health hazards. In the past two fiscal years, more than 50 materials have been approved, 24 have been disapproved, and 12 (including those disapproved), have been substituted with other greener, or less hazardous materials for use on the installation. The Environmental Division also assists units with obtaining extensions on expired or soon to expire materials. This reduces the risk of excess materials and cost savings in procurement of materials. It fulfills the

mission and goals for EO 13423 to ensure that the agency reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, increases diversion of solid waste as appropriate, and maintains cost effective waste prevention and recycling programs in its facilities.



**Utility Management and Control System:** Fort Hood has implemented innovative technology to manage the installation's direct digital control (DDC) systems through a web-based system called the Utility Management and Control System (UMCS). Fort Hood's UMCS technology and lessons learned can be transferred to benefit other installations. Army installations faced challenges in procuring facility control systems through various contract mechanisms resulting in incompatible control systems, making it difficult to manage. Previously, Fort Hood had several different DDC units in facilities throughout the installation. When facilities and buildings expanded on the installation, there were multiple proprietary vendor systems. With each proprietary system, software and hardware was needed for maintenance and operation, and was challenging for Fort Hood to efficiently manage its system. With an open system, protocols could be transmitted between two different vendor controls systems achieving interoperability. The Local Operating Network (LON) is the single platform that enables consolidation of different DDC systems into the UMCS, which gives Fort Hood the flexibility to develop a comprehensive energy management plan for the installation. As a result, the UMCS has generated over \$1.06 million in annual energy cost savings, which increases savings as more facilities are added to the system.



**Metering and Mock Billing:** Fort Hood met the suspense date of 2012 for designated facilities being metered, and is continuing the installation of advanced meters (to include natural gas and water). There are 188 facilities with electric meters online, accessible via the UMCS. This data is being used for efforts such as mock billing and energy auditing. Mock utility billing for Fort Hood units began in November 2010 with October electric consumption meter readings. The intent is to promote energy conservation and reduce consumption through increased awareness, behavior modification and competition among units. Each month, Commanders (O6 and higher) and Directors receive a mock electric bill from the Garrison Commander (GC). Fort Hood's mock billing program supports conservation efforts to reduce

consumption and create a culture of energy accountability.

**1 million kWh Solar Field:** In March 2011, Universal Services Fort Hood (USFH), a privatized housing partner, approached Fort Hood with plans for a solar field.



*The 1 million kWh solar field did not cost the Army or taxpayers anything. Photo by Christine Luciano.*



The DPW, U.S. Army Corps of Engineers' Fort Worth District and USFH explored the renewable energy opportunity. The \$3 million project did not cost the Army or taxpayers anything. The contractor, USFH, is solely responsible for financing, constructing, operating and maintaining the solar array and equipment. In March 2012, Fort Hood and USFH activated the solar field of nearly 3,000 photovoltaic panels. The four-acre solar field will generate one million kWh of renewable energy annually for 300 single-family homes. As part of the Army's challenge to pursue the net-zero energy goal to produce as much energy as the installation uses, the solar field is an opportunity that will bring green electricity to Families.

**Solar thermal systems:** Fort Hood is working toward higher energy efficiency and independence while reducing energy intensity by 3 percent annually. The installation is using solar thermal water heating systems and is increasing solar technology in new construction to meet LEED standards for green building certification. Five dining halls and the Abrams Physical Fitness Center are the first to use solar thermal technology, which will reduce use of fossil fuels for dining hall domestic hot water heating systems for kitchen areas and for fitness center pool heating by 30 percent of the actual load. The savings of the six solar systems is equivalent to the energy used to heat the pool year round.



## RECYCLING PROGRAM

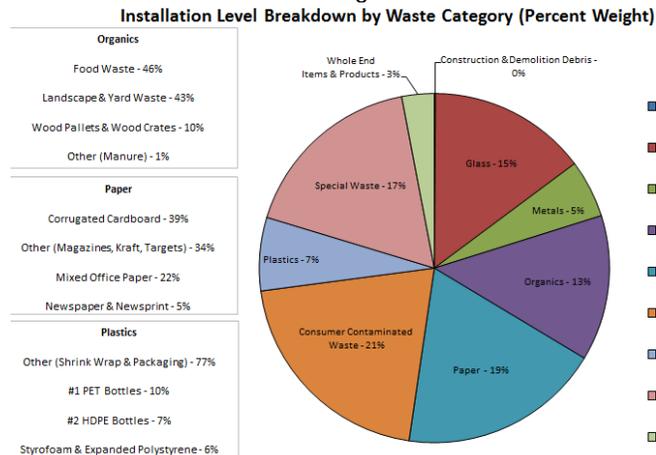


**Fort Hood Recycle Program:** The Fort Hood Recycle Program boasts the largest recycle facility in the Army. Through education and outreach, the Recycle Program staff increase the amount of materials recycled. When the recycle program was initiated in 1992, Fort Hood

sold 600 tons of recyclable material. It has continually surpassed its goals ever since. During FY11 and FY12, the recycle center sold 15,315 tons of recyclable material and generated approximately \$2.89 million with Defense Reutilization & Marketing Service sales assistance. Money generated from recycling pays for the program costs, capital improvements and funds other community outreach activities, such as Freedom Fest fireworks, Welcome Home celebrations, carnivals and the annual Earth Fest. During FY11 and FY12, approximately \$332,000 was returned to support installation pollution prevention projects and \$370,000 for family and morale, welfare and recreation events.

**Recycling partnership:** The Recycle Center and Killeen Independent School District (KISD) formed a partnership in February 2011, resulting in the garrison providing recycle services to two elementary schools. The partnership is an example of how installations and communities can work together to cut costs, increase recyclables and improve education. The partnership has increased recycle efficiencies for the district and helps give back to the Fort Hood community. The Recycle Center has set up recycle dumpsters to collect cardboard, all paper, mixed steel, aluminum cans and plastic. The pilot program was a success and the recycling effort was extended to two middle schools and seven elementary schools, collecting 62.624 tons.

**Material Flow Analysis:** Fort Hood conducted a material flow analysis to quantify the amounts and types of materials used at the installation and characterize the waste entering the landfill.



The graph illustrates the installation's waste assessment by category. Courtesy graph.

This information helps to identify the best opportunities to reduce, reuse and recover waste streams to achieve net

zero waste. The results of the assessment will help identify the waste to energy technologies that are best suited for Fort Hood's reduced feedstock.



**Net Zero Waste 2020:** Fort Hood representatives are working together for a greener and sustainable future to meet its Net Zero Waste goal — eliminating landfill waste by 2020. The slogan "2020: Perfect Mission, Perfect Vision," emphasizes that reaching Net Zero Waste will take a community effort to recycle and repurpose more and waste less. In December 2011, Soldiers, airmen, Civilians and contractors participated in Fort Hood's Net Zero Waste Kickoff Workshop to discuss ideas for the work groups, which focus on reducing, repurposing, recycling, marketing and outreach. The work groups' leaders have developed targets, objectives and action plans with their team members and brief their progress to the commanding general quarterly at the Environmental Quality Control Committee (EQCC). Some of the initiatives include:



- Partnering with organizations like Goodwill and the Salvation Army to donate personal property for reuse.
- Establishing agreements with manufacturers to purchase old electronics.
- Instilling supply discipline and procuring for use only.
- Including a clause in contracts that vendors will support net zero waste efforts.



Workshop participants brainstorm net zero waste ideas. Photo by Christine Luciano.

The positive outcomes of the initiative have resulted in the following:



- Creation of Recycle Coordinators at Company /Branch level and Recycle Councils at Director/ Commander level to expand recycling and composting.
- The GC signing an Operation Order for procedures to increase efficiency of briefing products and staffing actions that include printing double sided, posting information on the SharePoint site, printing in black and white, printing multiple slides on page and limiting the number of printed slides during briefings.

- An Installation-Wide Yard Sale that donated four tons of materials to charities with over 200 families in participation.
- Purchase of 472 96-gallon recycle containers and conducted a recycle pilot for single stream in two Family Housing communities. The pilot was successful and recycling efforts doubled. As a result additional recycle containers have been purchased and will be distributed to all 6,430 homes in Family Housing.



## GREEN PROCUREMENT

 San Antonio Lighthouse for the Blind (SALB), Post Supply and HazMart Store partnered with Fort Hood to create a culture that recognizes sustainability. The SALB promotes and implements cost-effective waste reduction and affirmative procurement programs for all products designed in the EPA's Comprehensive Procurement Guideline in support of its Environmentally Preferable Supplies Plan. When making buying decisions SALB considers the following:

- Products that contain post-consumer and pre-consumer recycled content.
- Efficient light products and educate customers to take expended bulbs to the Classification Yard for disposal
- A higher initial purchase cost if the product would require less maintenance or long-term costs over the life of the product or disposal cost.
- Products that contain the verbiage: Made in the USA, Biodegradable, Green Seal, USDA Organic, Energy Efficient, Fair Trade Certified, and Energy Star Rated.

SALB provides products for sale that protect the environment, contain recyclables, are reusable/recyclable/compostable or otherwise contribute to the Net Zero campaign. SALB works in partnership with the Environmental Division to ensure that any product sold from the store has reviewed and approved by DPW.

## SUSTAINABLE LANDSCAPING

 Fort Hood has a policy that requires all installation landscape utilize native plants. Soldiers, contractors and civilians are typically familiar with common non-native ornamental plants. In the fall of 2012, installation received a grant to build an educational and interpretative garden site for butterflies, bees, bats and birds. The garden will be a tool to showcase environmentally responsible landscaping practices for the installation; serve as an integrated approach to landscaping that addresses area beautification, native vegetation, and wildlife habitat; reduce

maintenance costs by eliminating the need for mowing operations; and improve the workplace and recreation areas aesthetically through beautification. The garden will also be an education tool for school groups as well as Soldiers, civilians, contractors, and general visitors on wildlife flowering, drought tolerant plants, sustainable and water wise landscaping, and wildlife habitat. And it will serve as demonstrations for other pollinating gardens and the necessary components for making a successful habitat for butterflies, bees, and birds.



## FLEET PERFORMANCE

 In 2005, the Fort Hood Directorate of Logistics (DOL) and Environmental Division partnered together to develop a project and establish the infrastructure for Ethanol 85 and biodiesel. Fort Hood worked with the Defense Energy Support Center (DESC) to fund and make required capital improvements to support alternative fuels. The DESC established the infrastructure and the associated costs to help Fort Hood expand its available fuels from JP-8, gasoline unleaded, and ultra low sulfur diesel to also include E-85 and biodiesel. With the support of DESC, DOL, and DPW, Fort Hood services the GSA fleet with alternative fuel capabilities. Of the 1253 total GSA fleet vehicles fueled at Fort Hood, 652 vehicles can use alternative fuel. Since March 2009, when the automated fuel service station began offering E-85 and biodiesel, GSA fleet vehicles, which also include emergency service vehicles, have consumed 253,987 gallons of biodiesel and 416,036 gallons of E-85.

## EDUCATION, OUTREACH AND PARTNERING

 **Environmental Compliance Assessment Team:** Fort Hood's ECAT helps Soldiers and civilians find solutions and achieve environmental success by ensuring their customers are informed of Fort Hood's environmental regulations and policies and receive required training. During FY11 and FY12, ECAT conducted 419 assessments, 222 courtesy assessments, 1,170 assistance visits and 86 facility closeouts for Fort Hood units and organizations. The ECAT also conducted 194 environmental briefs and trained 9,677 Soldiers, civilians and contractors. ECAT goes through steps to help each organization identify deficiencies, help correct them and then formalize procedures and policies to prevent further occurrences. Semiannually, ECAT audits each organization's EMS based on environmental significance. The internal audits give Fort Hood the opportunity to educate, inform and provide solutions to minimize environmental vulnerabilities and impacts on the



installation.



*ECAT provides training, support and guidance to every unit on the installation. Photo by Christine Luciano.*

These audits are published and any non-conformance or deficiency requires a reply by memorandum from senior leadership. The III Corps Chief of Staff and GC received the results and conduct a management review. This internal audit process has been instrumental in Fort Hood's continuous improvement process. The Environmental Division plans and executes its EMS based on the findings of audits, presents them at the quarterly EQCC, chaired by the Commanding General, and continually improves. If something isn't working or needs changed based on those reviews, we "just do it."

**EQCC:** The III Corps Chief of Staff and GC quarterly chair an EQCC meeting. The EQCC coordinates the installation's environmental programs to preserve and enhance the environment, and ensure compliance with environmental laws, regulations and policies. Military and civilians leaders work together to plan and execute decisions related to environmental protection, installation sustainability, military land stewardship, natural resource conservation, energy efficiency and security, and the EMS. During each meeting, the installation's environmental challenges and successes for the quarter are discussed to identify the root cause and how military and civilian activities can improve. Meetings are also held as tours at environmental facilities to increase awareness of environmental programs and services available and educate new commanders on the installation. The meeting provides a forum for open lines of communication to increase environmental performance and help integrate sustainability principles. It also is an opportunity to share lessons learned that enhance mission readiness and promote environmental stewardship.



**Cen-Tex Sustainable Communities Partnership:** The Cen-Tex Sustainable Communities Partnership was created in 2009 with the surrounding communities of Killeen, Copperas Cove, Harker Heights

and Gatesville. An executive committee, consisting of City Managers and the GC, meets quarterly to make program decisions for the partnership. A staff committee of three voting members per partner works objectives and targets to implement the partnership projects. Currently, the main project of the partnership is Regional Recycling, and the staff committee is researching private industries that may be interested in building a single stream recycling facility in the region. A regional recycling forum with Central Texas community members occurred in November 2011 to discuss pay as you throw, single stream collection and new ways to collect and process recyclables. Copperas Cove has taken the next step forward and the council recently approved the proposal for single stream recycling, which will be implemented in the community in 2013.



**Earth Fest:** Each year in April, Fort Hood hosts an Earth Day event to bring awareness that environmental stewardship is important at all levels from the Family members, Soldiers, civilians, and leaders of the installation's many divisions and Directorates. The event is hosted and supported by the Environmental Division and the Fort Hood Recycle Program. The 2011 Earth Fest event was in partnership with DFMWR's annual Month of the Military Child Fest. More than 18,000 people and 1,700 students Central Texas school districts attended the environmental education event. The 2012 Earth Fest event was another success with more than 12,000 people and 1,000 students.



**Community Services Council Meeting:** The Community Services Council is a monthly community-wide forum that brings awareness of Fort Hood and area community events to key representatives of military and civilian activities. The Environmental Division participates to promote America Recycles Day, Earth Fest, Pollution Prevention Week, Household Hazardous and Bulk Recycle Turn-In, recycle challenges, and other environmental outreach efforts.

## CONCLUSION

The Environmental Division plays an active role of seeking opportunities at all levels and increasing environmental stewardship and awareness of Fort Hood's environmental policy, programs, and services. Fort Hood is committed to enhancing mission readiness and environmental excellence on the installation. Supporting a daily on post population of 80,000 people, it takes everyone's involvement to work towards a greener and sustainable future.