**2019 SECRETARY OF DEFENSE/**
**2019 SECRETARY OF THE ARMY**
**ENVIRONMENTAL AWARDS**

**Fort Leonard Wood, MO**
**Installation Strategic Sustainability Program (ISSP)**

**Installation Sustainability, Non-industrial**

Fort Leonard Wood (FLW) established and implemented its Installation Strategic Sustainability Program (ISSP) to address requirements under Executive Order (EO) 13834 – Efficient Federal Operations and incorporate sustainability and resilience into Installation operation in support of the Mission. The ISSP supports Installation stakeholders in integrating sustainable practices, technologies and concepts into all activities. In FY17, the Senior Mission Commander, MG Kent Savre, requested additional focus on short-term implementation efforts linked to the Mission. In response, the ISSP engaged stakeholders to develop annual mission-focused projects that align with the Integrated Priority List (IPL). The IPL is approved by the Senior Mission Commander and the IMCOM-Training Director through the Installation Planning Board (IPB). In FY18, the executed 24 IPL-linked projects in addition to on-going sustainability efforts. Project were reviewed and re-directed (as needed) during mid-quarter project team meetings. The additional engagement and Mission emphasis have paid immediate benefits and when combined with long-term projects has moved the Installation forward – for this reason, FLW presents this award nomination for leadership consideration.

## INTRODUCTION

FLW is a United States Army installation located in the heart of the Missouri Ozarks. Surrounded by the Mark Twain National Forest, the 61,000-acre fort is part of a larger rural area known as the Salem Plateau or, more simply, the Ozarks. This region is home to rugged hills, deep ravines, karst geology, caves, sinkholes, and springs that have shaped both the natural and the manmade landscape for millennia.

FLW provides basic training for most non-combat military occupations and advanced individual training for military engineers, chemical, biological, radiological, and nuclear specialists, military police, and motor transport operators. FLW delivers continuing education for Soldiers, non-commissioned officers, warrant officers and commissioned officers. In FY18, FLW conducted 245 courses and supported a training load of 86,000 military personnel.

FLW shares borders with its neighboring communities of Waynesville and St. Robert. Both communities are active partners in the ISSP and support regional sustainability efforts spearheaded through the Sustainable Ozarks Partnership (SOP). The ISSP includes efforts to expand existing and establish new partnerships that promote sustainable development that increases the regional resiliency and benefits the people and the Installation.

**Mission:** The Maneuver Support Center of Excellence (MSCoE) develops competent leaders and warriors of character and delivers Engineer, CBRN, Military Police, and Maneuver Support capabilities to enable mission success across the range of military operations.

**Vision:** At the heart of mission success, across the range of military operations, are capable warriors/leaders with unique skills and tools developed at the Maneuver Support Center of Excellence, FLW.

**Our Role:** To provide the operating force with trained and ready Soldiers who serve ethically and lead effectively in ambiguous situations, and who possess unique Maneuver Support capabilities-skills and tools -that enable commanders to achieve victory

**EVALUATION CRITERIA**

PROGRAM MANAGEMENT | ORIENTATION TO MISSION (SECDEF) | IMPACT & OUTCOMES | TECHNICAL MERIT | STAKEHOLDER INTERACTION | TRANSFERABILITY

## BACKGROUND

FLW used the Army strategic planning process, referred to as Installation Strategic Sustainability Planning (figure 1), to identify long-term sustainability challenges and establish its Lines of Effort (LOEs) and supporting objectives to address these challenges. The plan, developed with input from more than 150 stakeholders from the installation and surrounding community, consists of six LOEs:

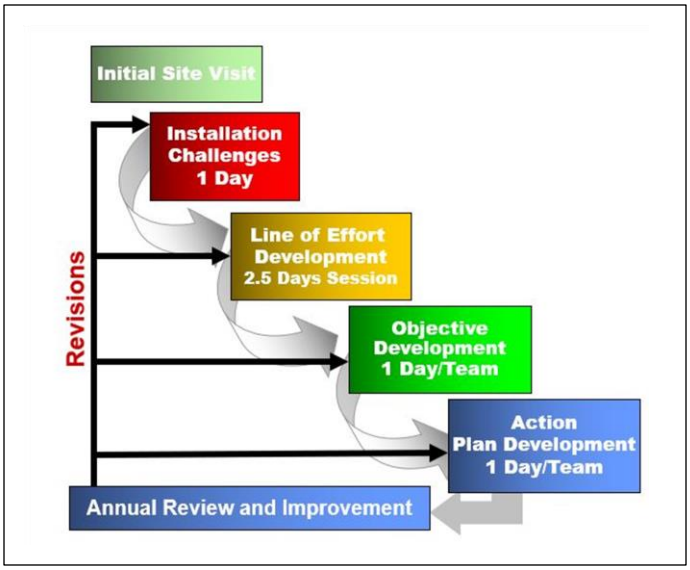


*Figure 1 - Army Strategic Planning Model used at FLW FY11-12*

**LOE 1 – Sustainable infrastructure powered by secure, sustainable energy sources** which addresses renewable energy development and use, sustainable development, high performance buildings and renovations, water and energy efficiency and conservation, waste reduction, multi-modal transportation systems and resilience. This team is led by the Director of Public Works (DPW) and supported by the DPW Planning, Operations, Engineering and Environmental Divisions, the DPW Energy Manager and the Directorate of Emergency Services (DES).

**LOE 2 – Innovative and effective mission services** which addresses efficient transportation (supporting greenhouse gas reductions), electric and autonomous vehicles, local and sustainable foods use in dining facilities (DFAC), accuracy in service requests to reduce waste, and deployment/re-deployment systems. This team is led by the Logistics Readiness Center (LRC) Director and supported by the Transportation Officer and DFAC Manager.[1]

**LOE 3 – Fully engaged community** which encourages community partnerships and cooperative programs to improve regional sustainability and quality of life including improved regional transportation, renewable power system development, regional recycling and solid waste management, and academic partnerships relevant to the Army Mission. FLW PAIO and the Public Affairs Office (PAO) coordinate this team with the Sustainable Ozarks Partnership (SOP), the Mayors of Waynesville and St. Robert and other partners (see figure 2).

**LOE 4 – Service Members, Families, and Civilians Resilient in body, mind and spirit** which pursues expanded services to support a high quality of life, healthy foods for Soldiers, Military personnel, Families and Civilians, smooth transitions from military to civilian life, and expanded recreational opportunities. This team is led by the Director of the Family, Morale, Welfare and Recreation (FMWR) directorate and supported by several FMWR program managers, the FLW Career Skills Program (CSP), the Chaplain, and General Leonard Wood Army Community Hospital (GLWACH).

**Local, State and Federal Partners**

- Sustainable Ozarks Partnership (SOP)
- Mayors of Waynesville and St. Robert
- Pulaski County Growth Alliance (PCGA)
- Waynesville-St. Robert Chamber of Commerce
- Office of the Missouri Military Advocate (reports to Governor's Office)
- Missouri Department of Economic Development
- Missouri Department of Agriculture
- University of Missouri Science and Technology (Missouri S&T)
- US Forest Service
- US Army Corps of Engineers
- Assistant Chief of Staff for Installation Management – Privatization and Partnerships

*Figure 2 - Community Stakeholders*

[1] Depending on training tempo, FLW DFACs prepare and serve approximately 11M meals/yr at a cost of $70M/yr.

**LOE 5 – A culture of pride and trust throughout the FLW workforce** which addresses workforce development across all organizations and human resource functions. This team is led by the Deputy Garrison Commander and the MSCoE G3 Technical Director – the team is supported by the Director of Human Resources (DHR), the DHR Workforce Development specialist, and the Civilian Personnel Advisory Center (CPAC) manager.

**LOE 6 – Modern, adaptable and high-performance training facilities, ranges, land and air space** which addresses integration of sustainability into the training mission including sustainable land use planning, buffer development, high-performance facilities, land impact reduction and mitigation, habitat protection (in conjunction with DPW/ENV), range utilization optimization, remote deployment of renewable power systems, and transportation systems to access ranges and training areas. This team is led by the Director of Plans, Training, Mobilization and Security (DPTMS) and is supported by the Range Operations Manager, DPW ENV and Integrated Training Area Manager (ITAM).

The Garrison Plans, Analysis and Integration office (PAIO) oversees the sustainability management system by tracking plan implementation and hosting eight (every 6 weeks) in-process review (IPR) meetings where LOE implementation teams report on their activities and progress in supporting mission requirements through sustainable approaches, reducing environmental impacts, increasing resiliency, improving the community's quality of life, and reducing costs to improve installation sustainability. These successes are documented in FLW's annual sustainability report.

At the direction of the MSCoE Commander, starting in FY17, annual ISSP activity was more closely linked to Installation Priority List (IPL) through the Installation Planning Board (IPB). PAIO expanded the scope of the program to include an annual ISSP implementation workplan that is developed by stakeholders to accomplish specific project objectives that support the ISSP goals and address the Commander's IPL. The annual work plan is approved by Commander and IMCOM-Training Director as part of the IPB. To support implementation of the projects, the process was expanded in FY18 to include mid-quarter project team meetings. During the week, each team meets to update project progress, identify mid-course corrections, identify additional tasks, discuss barriers, and resolve the path forward. Further, PAIO may convene additional project team meetings to develop plans for new projects

## DESCRIPTION OF PROGRAMS

The ISSP implementation process (figure 3) relies on engagement to identify challenges, solution strategies, projects and research needs to better understand Installation systems and sustainability opportunities. The Construction Engineering Research laboratory[2] supports the quantification, research and demonstration needs identified through the ISSP. In FY17-18, CERL completed 16 technical evaluations and documented findings in technical reports including evaluation of water and energy resilience options. In addition, CERL documents all ISSP activities and provides them to the Army through the Engineering Knowledge On-line (EKO) website. This ISSP process provides a continuous

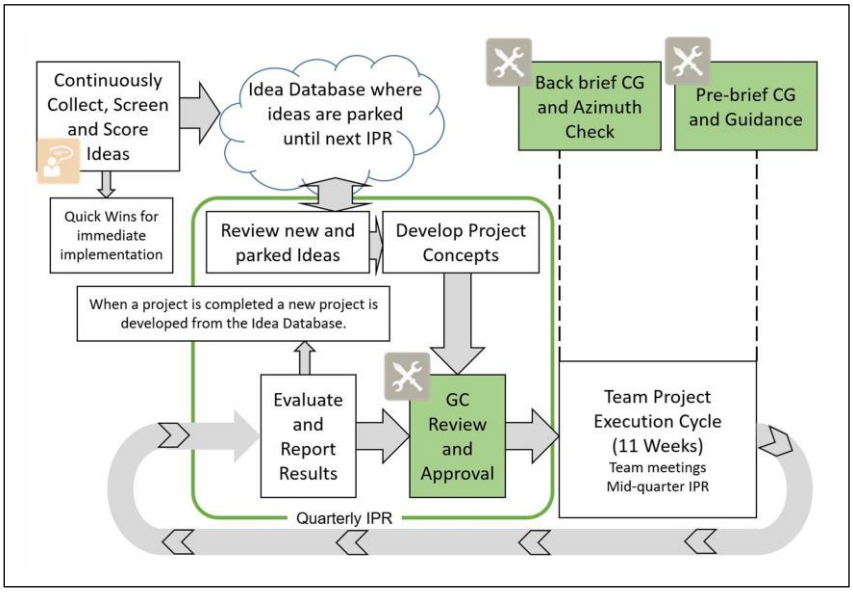


*Figure 3 - FLW ISSP Implementation Process*

[2] CERL is part of the Corps of Engineers US Army Engineer Research and Development Center (ERDC)

improvement process that identifies issues and opportunities, supports stakeholders as stakeholders pursue change, quantifies and tracks results, and provides them as lessons learned to the Army.

## SUSTAINABILITY CHALLENGES

During initial planning, stakeholders were asked to develop and strengths, weakness, opportunities and threats (SWOT) analysis to define the scope of the plan – in short, what sustainability challenges (weaknesses and threats) do we face and how can we leverage strengths and opportunities to change. The stakeholders identified significant challenges with:

**Infrastructure (LOE1)** – FLW is challenged with the adaptability of facilities for new or expanded Missions, operational costs for power and water, future availability of water, maintenance costs for aging facilities, and overall facility design that hinders the Mission and/or is expensive to maintain or upgrade;

**Mission Services (LOE 2)** – FLW's ability to provide optimized logistical services with minimum waste and without any interruption to the Mission;

**Community Engagement (LOE3) –** FLW needs to strengthen current relationships to ensure thriving partnerships that support the long-term viability of FLW and the region to host current and future Army Missions;

**Community Well-being (LOE4)** – FLW is challenged to provide services and support that provide high-quality of life that is consistent with the Soldier for Life concept and Army values;

**Workforce Development (LOE5)** – FLW works to create a working environment that meets the professional development needs to ensure the resilience, adaptability and skills of the entire workforce; and

**Training (LOE 6)** – FLW seeks to protect the natural resources, land, and facilities need to address current and future training requirements.

## SUMMARY OF ACCOMPLISHMENTS FOR FY17-18

For FY18, the sustainability team identified, planned and initiated 24 projects in addition to on-going, longer-term efforts. Of the new efforts were completed, 2 were extended to be completed in FY19. These efforts and longer-term projects supported EO 13834 compliance, livable communities, master planning, green building and sustainable development and education/outreach/partnering FLW sustainability goals. Highlights for FY17-18 are provided below:

### EO 13834 Compliance

**LOE 1 Project – Combined Heat and Power Project Funded and Designed:** A Corps of Engineers stakeholder raised a question about boilers that would need to be replaced in the Specker Barracks complex. The stakeholder was curious as to what other options might provide a more sustainable option to a traditional boiler. This starting question resulted in a feasibility analysis for development of a combined heat and power (CHP) system to augment existing Specker Barracks boilers (figure 4). With technical support from the CERL, the LOE1 team members developed the project in 2015. In 2016, the Energy and Resilience and Conservation Investment Program (ERCIP) selected the FLW CHP for funding. In FY17, the project was funded, and the design completed in FY18. The CHP will support FLW in meeting Energy Independence and Security Act (EISA) 2007, EO 13834 compliance, and other mandates. The CHP will provide cogeneration of power and heat that will be added to the existing heating/cooling plants. The system will produce approximately 2.5MW of power which is 7 percent of the Installation's annual electrical energy use. The project will increase resilience (as per DoDI 4170.11) and save $8M over its lifetime.

*Figure 4 – Specker Barracks Boiler*

## Green Building and EO 13834 Compliance

**LOE 1 Project – First Army LEEDv4 AIT Barracks Completed:** In FY17, the first Leadership in Energy and Environmental Design (LEED) v4 Advanced Individual Training (AIT) barracks complex including a Barracks Company Operation Facility (BCOF), DFAC, and Battalion Headquarters (BNHQ) (figure 5) in the Army was completed at FLW. FLW and U.S. Army Corps of Engineers (USACE) worked together on the design of this complex, with DPW Master Planner hosting the design charrette, and stakeholders collaborating on specific elements of the plan. Design elements from this project were submitted by USACE to the Holcim Foundation for Sustainable Development in 2011, where it received an Acknowledgment Prize for Sustainable Development in the international design competition. USACE incorporated elements from the Holcim competition into the AIT barracks complex plans. FLW's participation in the process made them a logical choice as the pilot for the high-performance design. The complex will save more than 90 percent of indoor water use and 73 percent in energy costs. The AIT LEED v4 pilot program supports Army-wide implementation of this rating tool.

*Figure 5 - LEEDv4 AIT Barracks Complex*

## Master Planning and Green Buildings

**LOE 1 Project – Specker Barracks Decision Analysis and Plan:** In FY17, CERL developed a business case analysis comparing retrofitting the Volunteer Army (VOLAR) barracks (figure 6) to replacement. The analysis determined that the Army could save 50% in first construction cost (up to $150M) and 25% in life-cycle operating costs (due to increased energy efficiency) by replacing the 80 remaining VOLAR units in the Specker area. DPW Plans integrated this analysis with the Initial Entry Training (IET) Area Development Plan (ADP) developed with support from IMCOM HQ (FY17). DPW proposed to Training and Doctrine Command (TRADOC) a plan to replace the remaining VOLAR barracks with high-performance 5-story AIT barracks. TRADOC has agreed to this plan which will increase the efficiency, reduce cost and increase the capacity for AIT trainees to be housed in the area (eliminating an 18% deficiency) to better support the Mission.

*Figure 6 - VOLAR Barracks*

## Partnering

**LOE 2 Project – Airport Utilization and Expansion**

In conjunction with the Community and the Sustainable Ozarks Partnership (SOP), the Mission Services team (including LRC and DPW plans) has been working to expand transportation options at FLW (figure 7). Currently, groups of students arrive from and depart to the St. Louis Airport via bus – a logistical problem that impacts the training schedule Based upon the Airport Development Plan (supported by IMCOM HQ) and a follow-on airport study (FY17) developed by SOP and the community, stakeholders are working to expand the airport to accommodate large planes arriving from hub airports that will provide quicker direct access to FLW. The plan requires a parallel taxiway and new terminal to accommodate


*Figure 7- Fort Leonard Wood Main Gate and Visitor Center*

larger aircraft and more stringent security requirements. Based upon the plan, the State of Missouri has invested $2M for the terminal design. The FAA has invested $6-7M for the parallel taxi-way construction.

**LOE 3 Project – Acute Effects of Neurotrauma Consortium (AENC):** In FY17, the AENC was formed between five Missouri universities, the Phelps County Regional Medical Center, General Leonard Wood Army Community Hospital, the Army Medical Research Management Command (USAMRMC) and FLW. Basic training poses risks to Soldiers and opportunities for researchers to study methods to diagnose, reduce, eliminate and mitigate traumatic brain injuries. In FY18, the AENC was provided $10M to research acute trauma diagnosis, risk mitigation strategies and treatment to better protect Soldiers

**Partnering and EO 13834 Compliance**

**LOE 3 Project– Statewide Bio-Mass Availability Analysis:** The Army Office of Energy Initiatives (OEI) studied the viability of a biomass energy product facility for FLW – they determined that the availability of biomass was limited due to other regional demands for biomass. Due to market changes and abundant availability of biomass, in FY18, Missouri S&T funded by the Missouri Products Association completed a feasibility of using wood processing byproducts as a renewable fuel. Missouri S&T worked with the FLW DPW Energy Manager to identify viable technologies that could utilize biomass to support FLW power production needs. OEI is now scheduled to re-evaluate how this emerging industry might be used to provide a renewable power source to FLW.

**Livable Communities**

**LOE 4 Project – FLW Trails System:** In FY18, FLW began efforts to increase access to alternative forms of transportation. The first effort was developing a plan for connecting existing trails (figure 8) and expanding them into a greenway pedestrian and bike network. The project team evaluated current trails, identified options for connectivity. The team finalized a three-phase implementation plan (FY19-20). The Greenway will provide additional, safe exercise and recreational options and well as connect various pedestrian trails.

*Figure 8 – FLW Trails*

**LOE 4 Project – Historic Black Officers Club:** Historic preservation is a critical part of creating a thriving, sustainable community. One of the most notable historic buildings at FLW is Building 2101, the historic WWII Black Officers' Club. Among its historic attributes, the building includes a large mural (figure 9) painted in 1945 by then Soldier and artist Samuel Countee. The painting was removed and restored for re-installation upon completion of facility renovations completed in FY18. The facility will be used as a general-purpose classroom starting in FY19 including future ISSP IPRs and project team meetings.

*Figure 9 - Mural painted by then Staff Sgt. Samuel Countee in 1945*

**LOE 5 Project - Installation workforce stewardship board (IWfSB):** Historically, each command and tenant organization is responsible for various workforce recruiting, oversight and development activities. In FY18, the Deputy Commanding General and the Deputy Garrison Commander supported the workforce team (LOE 5) in establishing the IWfSB that is tasked with developing policies and projects to integrate and strengthen various

workforce development efforts. The IWfSB charter establishes a working group consisting of all HR functions on the installation and staffed by representatives of all career programs at FLW. The board will work to integrate similar functions, leverage training and developmental assets across FLW, and identify priority projects that will be worked through the ISSP.

**Sustainable Land Management (including landscaping)**

**LOE 6 Project – Unmanned Aerial System:** In FY17, FLW DPTMS and DPW/Environmental worked with CERL to develop an Unmanned Aerial Systems (UAS) project to evaluate the conditions of training areas, land-use impacts, ecosystem health and facility performance (heat loss and envelope integrity). In FY18, FLW initiated deployment of its own UAS for data collection on land impacts associated with training. In 15 minutes, the UAS can compile land condition and environmental data on 1,000 acres. On average, a DPTMS crew spends eight hours compiling similar data on 10 acres of land. The UAS will save staff time and provide data in real-time. The project will likely have broad use throughout the Army.

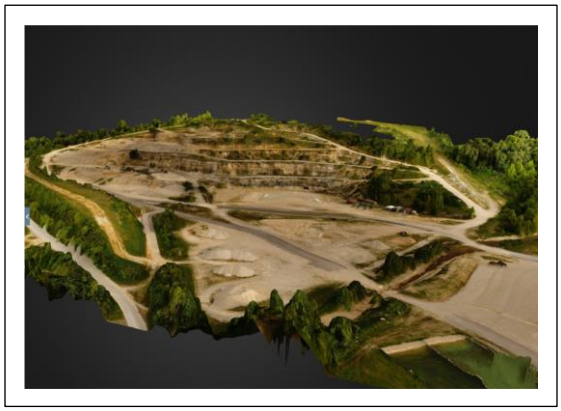

*Figure 10 - UAS photorealistic image of FLW Quarry*

**LOE 6 Project - Installation-wide Land Use Map:** FLW cover 61,000 acres of land. This project provides a quick-reference land-use map FLW. Through this effort, the DPTMS-led team mapped current land-use patterns, identified areas that are not available for future use or development, summarized all known land-use restrictions to support future Command decision-making.

## PROGRESS INTEGRATING SUSTAINABLE PRACTICES INTO MISSION ACTIVITIES

The ISSP integrates sustainability into Installation management supporting Mission success. Projects like the UAS and installation land use map illustrate how DPW and DPTMS are partnering, identifying and developing sustainability projects. DPW is integrating sustainability into new construction (AIT barracks) and master planning (VOLAR replacement and CHP). Projects like the greenway or Building 2101 preservation improve the overall condition of the Installation and performance. The ISSP process documents and supports these efforts throughout their development and execution – but the organizations are doing the work. The ISSP provides the planning framework and visibility needed to accomplish each objective supporting a long-term goal. Stakeholder-developed projects that are implemented with cross-functional support through the ISSP illustrates programmatic success.

## ISSP BENEFITS

The ISSP is a command-approved, stakeholder-developed and implemented vision for the Installation. FLW continues to meet energy, water and recycling goals. The ISSP process works beyond these traditional indicators to create a more sustainable and resilient Installation. Stakeholders develop projects that may take years to implement – the process helps them to persevere. The CHP project is a great example of why the ISSP is needed and works, as the project was started in FY14 and is anticipated for completion in FY20. The CHP will provide 7 percent of the installation's energy, increase resilience and save $8M. VOLAR replacement will save the Army $150M over the traditional continuous renovation and repair approach – this effort will reduce energy use by up to 73 percent, water use by 90 percent and will increase training capacity. The ISSP is Fort Leonard Wood's continuous improvement process for engaging expertise, planning a path forward and implementing improvements over longer periods of time. The ISSP and its FY17-18 process improvements provide the structure to develop a sustainable Installation capable of supporting the Army now and into the future.