



**NDCCE**

National Defense Center for  
Energy and Environment

Technology Experts • Sustainability Trailblazers • Collaborative Problem Solvers



2014 Annual Report

# After More Than 20 Years...



The NDCEE was established to help Department of Defense (DoD) installations, ranges, weapon systems, and the Warfighter achieve performance advantages, enhance efficiency and cost effectiveness, and comply with regulations. Our mission is to transition environmental, safety, occupational health, and energy (ESOHE) technology solutions in support of the DoD as it strives to maintain readiness, meet sustainability goals, and support Warfighters at home and abroad.

#### Photo Credits

Cover - stryker, DoD; airman, sailors, marines, U.S. Navy; C-17, U.S. Air Force. Page 7 - Pilots, U.S. Air National Guard. Page 9 - HMMVV, U.S. National Guard; warfighter, U.S. Army. Page 11 - ships, aircrafts, U.S. Navy. Page 12 - U.S. Army. Page 13 - return home, U.S. Army. Page 17 - demilitarization, U.S. Army. Page 18 - hydraulic equipment, U.S. Navy. Page 20 - sea disposal, U.S. Army; IED event, U.S. Army.

# A Message from the Office of the Executive Agent



Since 1991, the NDCEE has been critical in meeting ESOHE science and technology challenges. Its continued vitality and strength derives from constantly evolving and adapting to meet ever-changing local and global pressures. In 2014, the NDCEE adapted itself again by revitalizing the NDCEE Technical Working Group (TWG) and establishing three active focus groups (Environmental, Safety & Occupational Health, and Energy). The TWG is over 60 ESOHE subject matter experts strong, with members from across the DoD. Each focus group conducts monthly telecons to identify common ESOHE technology gaps and possible project collaborations.

In the 2013 Annual Report, I called on you to challenge this program. You did and the NDCEE leadership heard you. You want to see more joint projects and technology transitions. In response, the NDCEE Executive Advisory Board (EAB) met in October and approved the **new joint NDCEE Project Selection Process**. The three focus groups are tasked to identify and nominate projects to a joint review and approval board. A joint panel will review all project nominations including the potential of technology transition while addressing common ESOHE technology gaps.

Although we say good-bye to Mr. Hew Wolfe, we look forward to continuing to be your ESOHE science and technology leader. Thank you to Mr. Wolfe and all of you for your continued support and partnership in transitioning the best ESOHE technologies to end-users.

– **Honorable Katherine Hammack, Assistant Secretary of the Army for Installations, Energy and Environment**



Some say you know how lucky you are when you retire by those standing to your left and right. How blessed and honored I am to have all of you. Over the past four years under my watch and with your support, we have executed 80 task orders, representing over 90 technology solutions. I am overwhelmed by what the NDCEE program has accomplished and the impact we have made. This steady program remains committed to continuing our unwavering support to address Warfighter ESOHE needs. And like the Warfighter, we will continue to evolve to maximize our effectiveness.

Thank you again for all your support and warm wishes. I look forward to reading and hearing about the NDCEE program successes for many more years to come.

– **Hershell "Hew" E. Wolfe, Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health), and Department of Defense Executive Agent for the National Defense Center for Energy and Environment**



*Within the past two decades, the NDCEE has been....*



**TRUSTED**

- ...to be the voice of the Soldier, Sailor, Marine, and Airman to the ESOHE community.
- ...to ensure future DoD acquisition program requirements, policy, and other DoD guiding principles are informed by ESOHE challenges and needs.
- ...to demonstrate and transition timely and essential ESOHE technologies to end-users.



**SITUATIONALLY AWARE**

- ...via monthly ESOHE focus group discussions, quarterly Technical Working Group (TWG) meetings, annual Executive Advisory Board (EAB) forums.
- ...with a real-time network of experts across government and industry.
- ... with established and adaptable processes which capture and identify common ESOHE needs, collaborations, and future demonstrations.



**ENGAGED**

- ...with a joint project selection process, conducted annually, and coordinated with other DoD ESOHE Agencies.
- ...and invested in the ESOHE community over \$370M of funding resulting in over 425 technology demonstrations and transitions just within the past decade.

*...and the mission continues.*

**In support of our NDCEE mission, we conduct the following activities:**

- Define a **problem scope**
- Conduct **research and development**
- Conduct **testing and evaluations**
- Conduct **demonstrations and validations**
- Facilitate **transitions/transfers and training**

**...in ESOHE technology need areas.**



**Global Coverage**

- Afghanistan
- Canada
- Djibouti
- El Salvador
- France
- Germany
- Guam
- Honduras
- Iraq
- Italy
- Japan



- Kuwait
- Luxembourg
- Nicaragua
- Palau
- Republic of Korea
- Republic of the Marshall Islands
- Spain
- Sweden
- United States

# Technology Experts

The NDCEE is a leader in applying technological innovations contributing to the Warfighter's mission success. Through its expertise, the NDCEE advances the technology readiness level (TRL) of solutions and fields proven technologies, averaging an advance of 2 TRLs as a result of our efforts. The NDCEE applies a four-phase technology transition process:

**Assessment (TRL 1-8):** define the problem and identify potential solutions; this means ensuring end-user needs are well understood, and obtaining and evaluating technical, economic, and lifecycle data on current and alternative technologies

**Systems Integration and Testing (TRL 3-5):** advance scientific concepts and research towards tangible and integrated technical solutions; activities may involve preliminary design, system or process development and fabrication, prototyping, computer modeling, and bench-scale or laboratory testing

**Demonstration/Validation (TRL 6-8):** optimize, test, and evaluate potential technology alternatives against user requirements; evaluation objectives may include feasibility, optimization, and/or operational acceptance testing

**Transition (TRL 8-9):** field validated technologies for installation and weapon system end-users; fielding may involve implementation, start-up, training, and/or other support efforts.

NDCEE projects often span multiple years. The Technology Index lists all of the technologies addressed by projects active in 2014 although some activities may have spanned prior years. See page 16.



*"Our experience with this NDCEE technology demonstration has been invaluable in assessing the opportunity for full-scale implementation to reduce nitrates at our facility. The performance of the technology in a proof-of-concept demonstration was duplicated in a follow-on task which truly represented operational parameters. These efforts have provided information crucial in the decision to transition the technology."*

*– Jorel Knobelman,  
Physical Scientist, ARDEC*



## Incinerating Toilet

A common challenge at contingency bases is latrine waste. On behalf of PD-FSS, the NDCEE is testing a technology that incinerates latrine waste to avoid the storage and retention ponding of black water, reduce logistical footprints, and improve environmental responsibility. This system is fueled by JP-8 and reportedly has stack emissions comparable to residential oil boilers, and therefore below regulatory limits. The final product is non-toxic ash. The NDCEE will conduct field testing in 2015 at the Base Camp Integration Lab at Fort Devin.

## Energy Security Assessment (ESA) Methodology

The NDCEE continues to assist the Services with reducing energy-related vulnerabilities. With our ESA Methodology, we can identify potential single points of failure (SPFs) and solutions, prioritized based on each SPF's threat frequency, duration and impact. We demonstrated and validated our approach at 8 installations through 2014, finding 53-128 SPFs per site. In the worst case, 983 risks were associated with a site's SPFs. Most risks can be mitigated, improving an installation's energy security posture.

## Vehicle Event Data Recorder (VEDR)

In collaboration with TARDEC, the NDCEE designed, built, and validated two prototype VEDRs. VEDRs capture sensor data during vehicle crashes, rollovers, and blast and improvised explosive device (IED) events. Upon detecting an event, the device records 30 seconds of data from up to 25 data points. The data could be utilized to better design ground vehicles and safety measures as well as help alert first responders to potential injuries/fatalities prior to arrival. The NDCEE also provided training and produced a user's manual.

## Aircraft Maintenance and Corrosion Preventative Solutions

On behalf of NAVAIR, the NDCEE developed innovative tools and parts to better maintain MH-60R aircraft. Our tools reduce maintenance-induced damage to flight critical parts (\$2.5M annual savings in scraped parts) and decrease component removal time from 16 to 4 hours. Our gasket kit inhibits corrosion damage in the nose bay and aircraft frame, reducing maintainers' inspection and rework. Our quick-connect adapter plate system eliminated an 8-10 hour console disassembly by maintainers, improving workplace safety and cutting costs.

# Sustainability Trailblazers

For the DoD, sustainability means meeting the Warfighter's current and future needs. The NDCEE concentrates on three key sustainability aspects: environment, safety and occupational health (SOH), and energy.

**Environment represents those resources our nation requires to survive and prosper.** Given its potential impact to land, sea, and air, the DoD plays a key environmental stewardship role. With the NDCEE's aid, the Services are operating more efficiently by cutting waste and air emissions, using less water and material, switching to biobased products, and managing land use to meet mission, community, and wildlife needs.

**People are the DoD's most valuable asset.** For every project, the NDCEE evaluates SOH factors for the protection and betterment of personnel, family members, and the public. The NDCEE places a special emphasis on identifying and mitigating workplace injuries and hazard exposures – providing the safest and healthiest working and training conditions.

**Energy powers our transportation, operations, and homes.** Through its size and commitment, the DoD is a trailblazer in reducing energy needs and increasing energy surety and security. The NDCEE continues to reduce the DoD's fossil fuel consumption through process efficiencies, net zero energy initiatives, and renewable energy alternatives.



*"The NDCEE's capability to define a problem, design a solution, and engage with end-users and stakeholders was critical in the development of a geospatially-based information management process, with real potential to enhance DoD's situational awareness and protection of cultural, historic, and natural properties in support of international operations and engagement activities."*

*– Steven Hearne, Environmental Technology Office, ODASA(ESOH)*



## Sustainable Products Center (SPC)

Launched and maintained by the NDCEE, the SPC serves as the DoD's informational repository for sustainable products. It allows procurement specialists and end-users to make informed choices and fulfill DoD's directive to use sustainable and biobased products where feasible. The NDCEE evaluates products to ensure they meet military specifications, often stricter than commercial ones. Recently evaluated products include sorbents, compostable service ware, lubricants, hydraulic fluids, and engine oils.

Check the SPC out: [www.denix.osd.mil/spc](http://www.denix.osd.mil/spc)

## Defense Occupational and Environmental Health Readiness System (DOEHRS)

The NDCEE is helping the DoD and installations achieve the goals of reduced lost workdays and worker compensation claims. We produced an improved method and tools for DOEHRS to enhance the consistency of collecting, analyzing, managing and utilizing occupational health information. Using these tools, we surveyed 7,561 shops and evaluated 10,472 processes at 37 Army installations for occupational exposures. We established baseline records affecting thousands of workers where no record existed.

## Net Zero Approach

The Net Zero approach is a powerful force multiplier, dramatically increasing mission readiness effectiveness for today and our future. The NDCEE continues to assist Army installations and contingency operations to achieve their Net Zero goals. We conducted assessments that provide insight on current resource consumption at installations and found opportunities to reduce their energy and water usage and waste generation. We drafted a Net Zero Commanders Guide and conducted a study to aid in Net Zero policy guidance for contingency bases.

## Remediation Technologies

Contaminated water is a health and safety risk to military personnel, their families, the community, and wildlife. The NDCEE is actively tackling this problem. In 2014, we began laboratory validation testing on 2 remediation technologies, with field testing expected in 2015. The first technology sequesters heavy metals and remediates explosive compounds found in soils and groundwater. The second technology allows users in the field to quickly measure the levels of perchlorate and heavy metals in drinking, surface, and groundwater.

# Collaborative Problem Solvers

Working across the Services, the NDCEE pinpoints and solves priority ESOHE challenges. We have a broad and deep military perspective and an alliance of industry and academia, as well as government and non-government entities to deploy available and practical solutions.

The key to our technology transition success is early involvement with subject matter experts from our alliance to address every aspect of a solution, from technology to fielding. We work with:

**Manufacturers and Operating Contractors**  
to address weapon system acquisition and maintenance challenges

**Program Managers and System or Program Offices**  
to transfer technology from the lab to the field

**Federal Regulators**  
to ensure compliance

**End-users, Policy Makers, Specification Owners, and Financial Stakeholders**  
to ensure technologies can be effectively transitioned.



*“Over the past year the NDCEE reestablished itself within the ESOHE community. With the re-energizing of the TWG and the new joint project selection process, the NDCEE now provides an open forum for leaders to identify ESOHE technology gaps and a mechanism to collaborate on common technology projects.”*

*– Kristine Kingery, Director,  
Army Sustainability Policy, ODASA(E&S)*



## Multi-Attribute Sustainable Product Label

To help consumers buy environmentally preferred products at installation supply stores, products may soon carry a label displaying a standardized list of a product’s environmental attributes, similar to a food nutritional label. The NDCEE developed this label in partnership with GreenCircle Certified, LLC, a third-party certification company, with feedback from ODUSD(I&E), DLA, Military Services, GSA, EPA, the White House CEQ, and the DoD Sustainability Workgroup. Demonstrated in stores at JBLM and MGAGCC, the label was deemed useful by store personnel, shoppers, and base environmental and procurement personnel.

## Energy Security Integrated Process Team (ES IPT)

Energy security is a principal mission requirement across programs and functional domains, including installations, operations, and support related to both physical and cybersecurity. Team members of the newly formed ES IPT include ASA(IE&E), ACSIM, USACE, ARCYBER, and Army Deputy Chiefs of Staff from G-3/5/7, CIO/G-6, and G-8. Leveraging NDCEE’s body of knowledge, efforts conducted within this ES IPT provide senior leaders with risk-based situational awareness and solutions for decision making.

## Stormwater Management

Proper stormwater management reduces flooding and pollution runoff. The NDCEE has evaluated 12 installations, representing all of the Services, Arlington National Cemetery, and the Pentagon, for reducing pollution runoff to the Chesapeake Bay. Efforts were coordinated with the U.S. EPA and various state agencies. We also advised the Cemetery on its response to Virginia’s new Municipal Separate Storm Sewer System (MS4) regulations by piloting compliance methodologies and developing state-required plans. The approach and templates are transferrable to other urban DoD bases.

## Lead-Free Plating Robbers

For decades, plating shops have used a conductive masking tape (called plating robber) containing lead and other heavy metals. Because electroplating operators must manually apply this tape, they have faced direct exposure to hazardous materials. The NDCEE has validated two environmentally preferred plating robbers through field tests at Air Force, Navy, and Army plating shops used to refurbish weapon system components. Other stakeholders included DLA Aviation, AF Life Cycle Management Center, AMRDEC, NAVAIR, Naval Air Warfare Center, and RDECOM. Technology transition is in progress.



## ONE ARMY SOLDIER and ONE GOVERNMENT SERVANT

46 Years of Service ★ 16,801 Days of Service

1 Supportive Wife ★ 2 Loving Sons ★ 44 Years of Marriage

## ONE ARMY FAMILY



**Congratulations on Your Retirement!**



## Our Future

Over the past 20 years, the NDCEE has evolved into a recognized center of ESOHE research, focusing on demonstrating and validating over 260 technologies. These technologies may be hard or soft, spanning from best management practices and policy to a product. From the beginning, the NDCEE has been a "purple" program, seeking and transitioning technology solutions that satisfy joint Service requirements. The NDCEE is continuing to improve and adapt internal processes to ensure we remain a joint program. Our newly developed NDCEE project selection process, reenergized TWG and established focus groups exemplify our commitment. Over the next year we will leverage these efforts to identify more common Service needs and collaborate on projects.

An improvement objective in our process is to identify ESOHE technology end-users early on, both in and outside of the DoD, in an effort to ensure successful technologies have a home. As critical members of our team, our TWG and focus groups will be instrumental in identifying technical end-users early on so they may become a critical member of determining a technology transition plan. The result is a visionary team who will ensure the success and adaptability of the technology, not just one agency or developer. As Henry Ford put it-

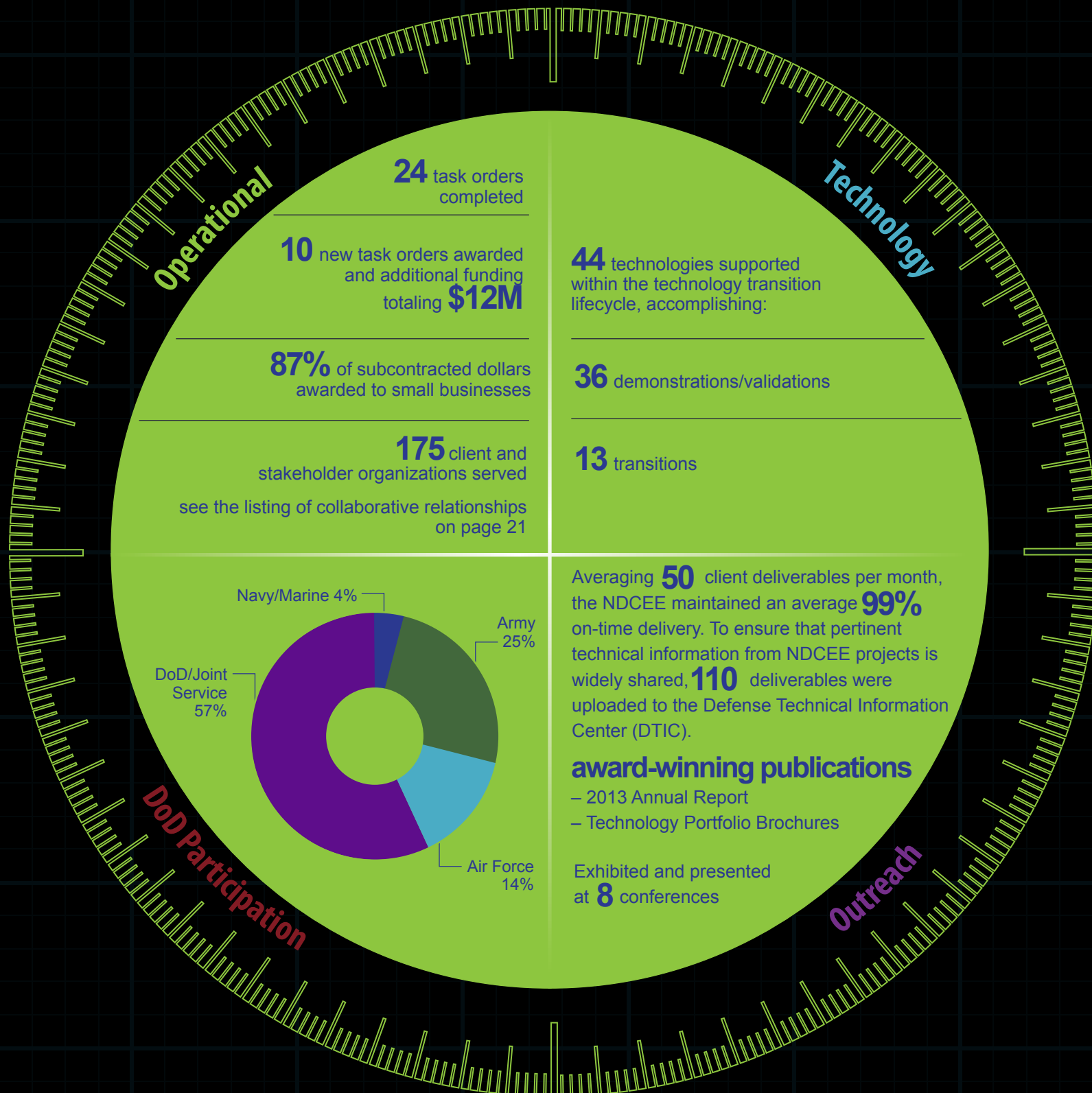
**"Coming together is a beginning. Keeping together is progress. Working together is success."**

The NDCEE mission continues as we work together ensuring technology transition successes.



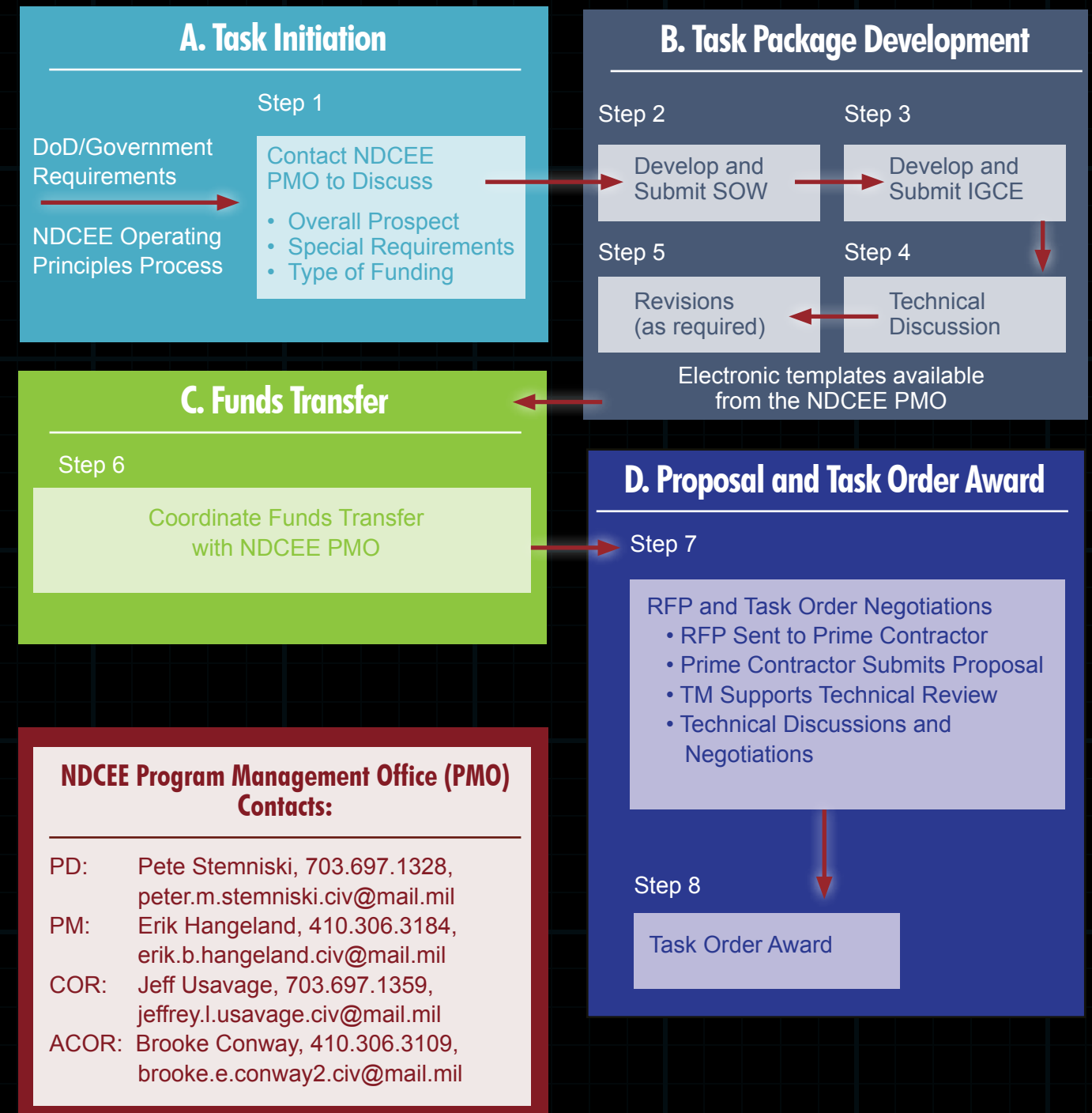
# 2014 Achievements

The NDCEE continues the critical mission it began over 20 years ago: identifying, demonstrating, evaluating, and fielding technologies in support of DoD readiness, sustainability, and the Warfighter.



# How To Do Business

The NDCEE is available to DoD and all federal agencies. Our customers benefit from leveraging the Army's investment in the NDCEE program infrastructure and its streamlined contract management and project execution. There is no administrative fee for using the NDCEE contract vehicle, allowing stakeholders to receive the maximum return on their RDT&E investments.





# 2014 Technology Index



## Advanced Robotic Laser Coating Removal System (ARLCRS)

Developed, demonstrated, and validated the use of a robotic laser system to remove coatings from aircraft. In 2015, the NDCEE will complete transitioning 2 systems to OO-ALC for annual savings over \$2.5M for F-16 and \$3.2M for C-130 aircraft.



## Benefits Realization Methodology (BRM)

Developed the BRM so the Army can reap modernization benefits that foster sustainability and readiness. The BRM confirmed \$2.4M in annual benefits when applied to 8 major projects and is currently being applied to a \$140M modernization effort.



## Chesapeake Bay Storm Water Compliance Approach

Assisted 12 DoD sites in the Bay's watershed with evaluating and achieving Total Maximum Daily Load (TMDL) compliance. Depending on facility, the NDCEE calculated baseline TMDLs, evaluated Best Management Practices (BMPs), and developed BMP concept designs.



## DOEHRS Collection Methodology and Tools

Demonstrated effective, efficient methods to assess workplace health hazards and maintain complete DOEHR records. The NDCEE established baseline records affecting thousands of Army workers where no current record existed.



## Air Force Enterprise Energy Management Framework Dashboard (AFEEFD)

Validated and refining AFEEFD for the USAF Energy Office. An interactive, web-based reporting tool, AFEEFD enables oversight of the USAF energy strategic plan and management across the enterprise.



## Biobased Firearm Cleaner Lubricant Preservative (CLP)

Conducted laboratory analysis and field tested 8 CLPs against DoD field performance requirements for cleaning, lubricating and preserving small- and large-caliber military weapons. The products were evaluated for 9 months by the Special Warfare Training Group at Fort Bragg.



## Consolidated Environmental Resources Database Information Process (CERDIP)

Developed a process for collecting, storing, and visualizing geospatial data on cultural and natural resource sites. The NDCEE is demonstrating CERDIP for 5 African countries to provide USARAF military planners with improved situational awareness.



## Demilitarization Enterprise Strategic Planning Procedural Guide

Produced a methodology for demilitarization (demil) execution and investment planning. It establishes business processes that provide a "systems" approach to integrate mission requirements and capability solutions with operational activity across the demil enterprise.



## Alertness Management in Military Operations (AMMO)

Developed a suite of fatigue management tools (including FlyAwake and WorkAwake) used to forecast periods of reduced alertness and lower the risk of fatigue-related mishaps. Both AMMO desktop and web-based versions are available.



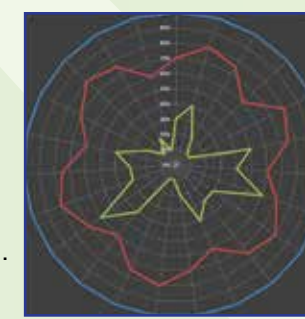
## Biobased Two-Cycle Engine Oils

Evaluated biobased 2-cycle engine oils that produce low or no smoke, have lower emissions, and perform similarly to petroleum products. The NDCEE demonstrated 2 marine engine oils in water-cooled outboard engines in 2014 and in 2013 demonstrated 4 air-cooled engine oils for small equipment.



## Counter-Current Ion Exchange (CCIX)

Identified and initiated demonstration testing and optimization of a CCIX technology to reduce nitrate concentrations in RFAAP wastewaters. The technology is expected to reduce nitrate concentrations by up to 80%. Demonstration testing will occur over a 5-month period.



## Economic Input-Output Life-Cycle Assessment (EIO-LCA) Tool

Developed and demonstrated a tool that monetizes ESOH impacts of candidate weapons systems, equipment, and platforms. Adapted from a commercial product, the tool fits defense acquisition requirements. It was validated on 2 weapon systems.



## Battery and Lamp Technologies

Identified and initiated demonstration testing of battery and lamp technologies for Camp Buehring. The focus is on drop-in technologies that maximize energy savings and can operate in higher summer temperatures as experienced by the Camp.



## Cadmium- and Hexavalent Chromium-Free Electrical Connectors

Tested 2 alternative coatings for electrical connectors to eliminate/reduce cadmium and hexavalent chromium usage in ground systems, such as Stryker vehicles. One candidate performed similarly or better than cadmium and is recommended for further investigation.



## Counterfeit Refrigerant Procedures

Tested 14 refrigerant blends to determine their effects on vehicle air conditioning (A/C) components. The Army is using the findings to develop procedures for containment and safe removal of vehicle A/C systems contaminated with non-approved refrigerants.



## Emission Factor Data Collection Tool

Demonstrated an NDCEE tool as part of ongoing emissions factors research being executed under SERDP. This software tool will help the DoD obtain and analyze high-quality data associated with performing specific demilitarization activities.



**Energy Security Assessment (ESA) and Mission Critical Utility Infrastructure-Conceptual Designs (MCUI-CD)**  
 Developed and demonstrated the tools at 3 bases. The ESA guide identifies energy risks and prioritizes mitigation solutions. The template provides a design of a self-sustaining electrical power infrastructure; vital for serving mission-critical loads.



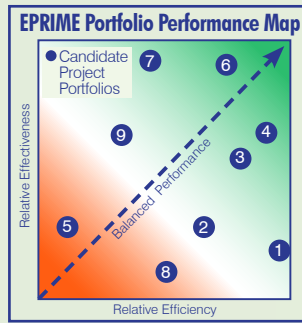
**Gray Water Reuse System**  
 Designed a 2-step process system that treats gray water (such as shower water) to a quality allowable by USAPHC for subsequent reuse such as vehicle washing and toilet flushing. This low-energy system was developed specifically for expeditionary deployment.



**Incinerating Toilet**  
 Investigated technologies that incinerate latrine waste to avoid the storage and retention ponding of black water, reduce logistical footprints, and improve environmental responsibility. Demonstration testing of an incinerating toilet will occur in 2015.



**MuniRem®**  
 Initiated demonstration/validation activities by conducting bench-scale testing on MuniRem's ability to sequester heavy metals and remediate explosive compounds. Field tests will occur in 2015 involving contaminated metal surfaces and groundwater, followed by development of technical guidance documents.



**Enterprise Project Investment Model for Energy (EPRIME)**  
 Developed and validated an Army decision support tool by assessing energy data. By measuring relative investment efficiency and goal effectiveness of projects, the web-based software allows the DoD to quickly identify superior energy investments.



**Handheld Laser for Coatings Removal**  
 Developed and demonstrated in an operational environment the use of handheld laser coatings removal technology for off and on-aircraft component processes used on small and large aircraft at ALCs. The technology is being transitioned to OO-ALC in conjunction with the ARLCRS.



**Innovative Tooling to Solve H-60 Maintenance Issues**  
 Developed tools to improve maintenance of H-60 aircraft. These tools remove the forward bridge tie rods and forward bridge eccentric bushings, which are particularly susceptible to maintenance-induced damage during corrosion inspection.



**Net Zero Approach**  
 Developed and tested an approach for planning, implementing, and monitoring installation success in meeting Army Net Zero goals. The NDCEE has produced several resource-specific and integrated Net Zero energy, water, and waste baseline assessments and installation action plans.



**Filtration and Disinfection Methods**  
 Identified disinfection technologies and analyzed international grey water regulatory requirements for a laundry wastewater filtration and recycling system installed at CLDJ. Using an NDCEE test plan, the Navy is validating the technologies through stateside and CLDJ demonstration testing.



**Heat Pump Water Heaters**  
 Aided NAVFAC EXWC with validating the technology can reduce expeditionary base energy needs, especially in torrid climates. Test results showed the units can support CLDJ's laundry and ablation facilities, offering energy and cooling savings.



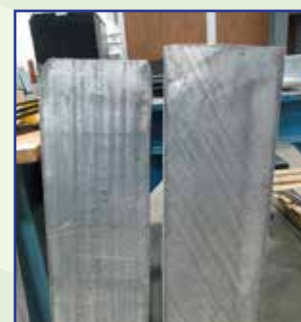
**Lead-Free Plating Robbers**  
 Identified and laboratory tested 6 candidates, and validated 2 products. Host field test sites were Navy, Army, and Air Force plating shops used to refurbish weapon system components. Technology transition is in progress. Robber selection is application dependent.



**Non-Destructive Testing (NDT) Techniques for Detection of Corrosion under Paint (CUP)**  
 Validated, per CUP standards, 4 NDT techniques can detect, at varying degrees, CUP found on aircraft. With NDT, costly, unneeded repairs, paint stripping, and repainting can be avoided, without compromising safety.



**Forward Looking Infrared (FLIR) Hand Control Unit (HCU)**  
 Designed and developed a FLIR HCU adapter plate and drill guide tooling for improving the sustainability and mission availability of the MH-60R helicopter. Successful validation of the adapter plate, drill guide, and corresponding Technical Directive occurred at Cherry Point ISSC.



**High-Strength Aluminum Alloys for Ballistics and Structures**  
 Researched, fabricated, and validated aluminum-magnesium alloy compositions as alternatives to aluminum-scandium alloys with similar ballistic and structural performance. Expected ESOH benefits include reduced costs and improved performance, leading to stronger and safer combat vehicles.



**MS4 Permitting Pilot Program**  
 Developed and conducted a pilot program to demonstrate methodologies at ANC for compliance with new stormwater regulations. The NDCEE provided several required plans, maps, and databases. The pilot approach and templates are transferable to other urban DoD bases.



**OSHA Challenge Pilot Program Instructional Manual**  
 Initiated development of an instruction manual for DLA Distribution Depots. This manual will provide techniques for implementing an occupational safety and health management system that exceeds minimal regulatory requirements and promotes a culture of safety excellence.



**Gasket Kit for Nose Bay Avionics Shelves**  
 Developed a gasket kit that provides corrosion prevention to nose bay avionics while allowing electrical conductivity. The kit significantly inhibits corrosion while reducing total ownership costs of the MH-60R, a maritime multi-mission helicopter.



**Hydraulic Fluid Purification (HFP) Systems**  
 Developed a Joint Service performance specification to ensure HFP systems satisfy performance and reliability requirements for military aviation equipment. All DoD Services, DLA Aviation and HFP system manufacturers provided input.

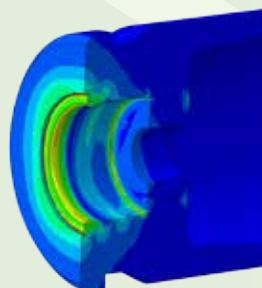
Certified Environmental Facts	
Company: 103	
Product: Absorbent	
Plant Location: Your Plant Location	
Product and Procurement Attributes:	
Non-toxicity	90%
Recycled Content	90%
USMA Recycled Product	Certified
Biobased Content	97%
Packaging Attributes:	
Biodegradable or Compostable	No
Material Use Reduction	No
Recyclability	99 - 99.99%
Recycled Content	25%
Take Back Recycling Program*	No
Manufacturing Attributes:	
Carbon Footprint Reduction	90%
Reduction of Energy Usage	95%
Reduction of Waste	90%
Reduced Water Usage	90%

**Multi-Attribute Sustainable Product Label**  
 Developed a label with GreenCircle Certified to assist buyers in selecting sustainable products that meet Federal Acquisition Regulations. It displays a standardized list of the product's environmental attributes. The label was demonstrated at installation supply stores.



**SafePort™ Quantitation System**  
 Conducted laboratory validation testing on the system for measuring perchlorate and heavy metals in drinking, surface, and groundwater. The intent of the system is to allow users to conduct quantitative chemical analysis in the field and receive lab-grade precision analyses within minutes.

# Collaborative Relationships



## Small Caliber Ammunition Process Improvements

Identified, developed, and tested several process and quality of work improvements for ammunition plants. Improvements included a more environmentally friendly identification test for residual stress in casings as well as tool and case redesigns, leading to higher quality ammunition.



## T-11 Parachutes

Validated the T-11 parachute reduces injury rates relative to the legacy T-10D parachute. Based on nearly 132,000 jumps, the T-11 had lower injury risk under virtually all operational conditions including night jumps, varied combat loads, higher wind speeds, higher temperatures, and diverse aircraft type.



## Solar-Powered Waste Compactor

Conducted demonstration testing that proved the technology is best suited for temperate or colder climates for general trash collection and identified limitations for single-stream recycling (e.g., plastic water or soda bottles, aluminum, or glass).



## Undersea Unexploded Ordnance (UXO) Characterization

Aided the DoD in developing methods for identifying UXO and associated safety hazards to fishermen in U.S. coastal waters. Activities included evaluating the fate and transport of arsenic and four additional elements, originating from sea-disposed munitions.



## Supervisor Safety Training (SST) Course

Constructed a hybrid Air Force course providing supervisors with basic understanding of OSHA, DoD, and Air Force safety program requirements. The NDCEE will deliver online and interactive instructor-led classroom courses.



## Vehicle Event Data Recorder (VEDR)

Developed and demonstrated a VEDR for recording sensor data during vehicle crashes, rollovers, and blast/IED events. The data improves the knowledge of design engineers to reduce crew injury and create safer vehicles. The NDCEE built 2 units and provided training.



## Sustainable Products Center (SPC)

Launched an independent, virtual center that serves as DoD's informational repository for sustainable products. Its purpose is to help procurement personnel and product end-users make informed decisions on potential alternatives that meet DoD performance requirements.



## Waste Management and Tracking Tool

Developed and demonstrated a software tool that shows promise in tracking Net Zero Waste progress and revealing trends that could help with planning at Camp Buehring. The tool can be customized for additional site deployment.

Collaborative relationships are an integral component of the NDCEE's success at identifying, demonstrating, validating, and implementing solutions for clients. From the onset of each task, the NDCEE works closely with stakeholders to understand their unique concerns, challenges, and needs. Wherever appropriate, the NDCEE also collaborates with other entities in the quest for a cost-effective, technically-viable solution that is most appropriate for each client. The NDCEE works with a wide variety of organizations and programs within the DoD. In 2014, the NDCEE worked with the following organizations and programs.

[Air Force Safety Center \(AFSEC\)](#)

[Air Mobility Command Fuel Efficiency Division \(AMC/FED\)](#)

[Air National Guard \(ANG\)](#)

[Alliant Techsystems Inc. \(ATK\)](#)

[Anniston Army Depot, AL](#)

[Arlington County, VA](#)

[Arlington National Cemetery \(ANC\), VA](#)

[Army & Air Force Exchange Service \(AAFES\)](#)

[Aviation and Missile Research Development and Engineering Center \(AMRDEC\)](#)

[BAE Systems, Inc.](#)

[Base Camp Integration Lab, Fort Devin, MA](#)

[Blue Grass Army Depot, KY](#)

[The Boeing Company](#)

[C-130 System Program Office](#)

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[Center for Environmental Management of Military Lands \(CEMML\)](#)

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[Combatant Command \(COCOM\) - Cultural Heritage Action Group \(CCHAG\)](#)

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For more information, contact Jennifer Nicholson, CTC's Program Director for the NDCEE, 443.345.5807, nicholsj@ctc.com

Fort Irwin, CA	Naval Base San Diego, CA	Program Executive Office Ammunition (PEO Ammo)	U.S. Army Cyber Command (ARCYBER)
Fort Knox, KY	Naval Facilities Engineering Command (NAVFAC) Engineering and Expeditionary Warfare Center (EXWC)	Project Director for Joint Services (PD JS)	U.S. Army Environmental Command (USAEC)
Fort Lee, VA	NAVFAC Mid-Atlantic	Project Manager Maneuver Ammunition Systems (PM MAS)	U.S. Army Garrison-Hawaii, HI
Fort Leonard-Wood, MO	NAVFAC Naval District Washington	Radford AAP, VA (RFAAP)	U.S. Army Geospatial Center
Fort Polk, LA	Naval Station (NS) Mayport, FL	Redstone Arsenal, AL	U.S. Army Installation Management Command (IMCOM)
Fort Stewart, GA	Naval Support Activity Mechanicsburg, PA	Robins AFB, GA	U.S. Army Institute of Public Health (USAIPH)
General Services Administration (GSA)	Naval Support Facility Carderock, MD	Scranton AAP, PA	U.S. Army Joint Munitions Command (JMC)
Hill Air Force Base (AFB), UT	Naval Support Facility Potomac Annex, DC	Sikorsky Aircraft Corporation	U.S. Army Logistics Innovation Agency (LIA)
Holston Army Ammunition Plant (AAP), TN	Nebraska Avenue Complex, DC	Strategic Environmental Research and Development Program (SERDP)	U.S. Army Materiel Command (AMC)
Joint Base Andrews, MD	Office of the Army Deputy Chief of Staff, CIO/G-6	Tinker AFB, OK	U.S. Army National Guard (ARNG)
Joint Base Charleston, SC	Office of the Army Deputy Chief of Staff, G-3/5/7	Tobyhanna Army Depot, PA	U.S. Army Public Health Command (USAPHC)
Joint Base Langley-Eustis, VA	Office of the Army Deputy Chief of Staff, G-4 Logistics	Tooele Army Depot, UT	USAPHC Region-South
Joint Base Lewis-McChord (JBLM), WA	Office of the Army Deputy Chief of Staff, G-8	Tripler Army Medical Center, HI	U.S. Army Research, Development & Engineering Command (RDECOM)
Joint Base Pearl Harbor Hickam, HI	Office of the Assistant Chief of Staff for Installation Management (ACSIM)	U.S. Air Force 18th Air Support Operations Group (18 ASOG)	U.S. Army Research Laboratory (ARL)
Joint Base San Antonio, TX	Office of the Assistant Secretary of the Army for Financial Management and Comptroller (ASA[FM&C])	U.S. Air Force Civil Engineer (AF/A7C)	U.S. Army Reserve Command (USARC)
Joint Ordnance Commanders Group (JOCG)	Office of the Assistant Secretary of the Army for Installations, Energy and Environment (ASA[IE&E])	U.S. Air Force Life Cycle Management Center, Wright- Patterson AFB, OH	U.S. Army Special Warfare Training Group (SWTG)
Lake City AAP, MO	Office of the Deputy Assistant Secretary of the Air Force, Energy (SAF/IEN)	U.S. Air Force Materiel Command (AFMC)	U.S. Army Tank-automotive and Armaments Command (TACOM)
Letterkenny Army Depot, PA	Office of the Deputy Assistant Secretary of the Army for Energy & Sustainability (DASA[E&S])	U.S. Air Force Office of Logistics Readiness (AF/A4L)	U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC)
Marine Corps Air Ground Combat Center (MGAGCC) – Twentynine Palms, CA	Office of the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (DASA[ESOH])	U.S. Air Force Operations, Plans, and Requirements (AF/A3O)	U.S. Army Western Regional Medical Command
Marine Corps Base Hawaii, HI	Office of the Deputy Under Secretary of Defense Installations and Environment (DUSD [I&E])	U.S. Air Force Research Laboratory (AFRL)	U.S. Central Command (CENTCOM)
Marine Corps Base Quantico, VA	Office of Naval Research (ONR)	U.S. Army XVIII Airborne Corps	U.S. Department of Agriculture (USDA)
Marine Corps Mountain Warfare Training Center, CA	Ogden (OO) Air Logistics Complex (ALC), UT	U.S. Army 82nd Airborne Division	U.S. Department of State
Maryland Department of the Environment	Oklahoma City ALC, OK	U.S. Army Africa (USARAF)	U.S. Department of Veterans Affairs (VA)
Natick Soldier Systems Center, MA	Pacific Disaster Center (PDC)	U.S. Army Armament Research, Development and Engineering Center (ARDEC)	U.S. Environmental Protection Agency (EPA)
National Aeronautics and Space Administration (NASA)	Pennsylvania Department of Environmental Protection	U.S. Army Aviation and Missile Life Cycle Management Command (AMCOM)	U.S. Military Academy at West Point, NY
National Geospatial Intelligence Agency (NGA)	Pentagon Reservation, VA	U.S. Army Central Command (USARCENT)	U.S. Southern Command (SOUTHCOM)
National Guard Bureau (NGB)	Product Manager for Demilitarization (PM Demil)	U.S. Army Corps of Engineers (USACE)	Virginia Department of Conservation and Recreation
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Naval Air Station (NAS) Jacksonville, FL	Product Manager Soldier Clothing and Individual Equipment (PM SCIE)	USACE – CERL-Engineer Research and Development Center (ERDC)	Walter Reed Army Institute of Research
NAS Whidbey Island, WA			Warner Robins ALC, GA
Naval Air Systems Command (NAVAIR)			White House Council on Environmental Quality (CEQ)
Naval Air Warfare Center			Yuma Proving Ground, AZ
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