



# *Water Quality and Supply*

*Providing long-term  
water resource solutions*





## Ensuring a Sustainable Water Landscape

The NDCEE is assisting Department of Defense (DoD) installations to combat both water scarcity and water quality concerns. Many installations are located in areas where consumption is higher than the rate of natural replenishment. Contaminated water is a health and safety risk to military personnel, their families, the community, and wildlife. Various mission operations, including industrial and maintenance, also rely on quality water to perform their functions.

### Water Compliance Highlights

#### Chesapeake Bay Regulatory Compliance

Assisted 12 DoD facilities in the Chesapeake Bay Watershed with reducing pollutant runoff. Depending on the installation, we calculated baseline pollutant loads, evaluated applicable load reductions from existing and proposed Best Management Practices (BMPs), and developed BMP concept designs for high-priority proposed BMPs.

#### Mobile Water Resource Recovery

Conducted a 3-month demonstration at Fort Leonard Wood of an energy-efficient, mobile and scalable unit that enables contingency bases to meet environmental requirements. The technology shows potential for temporary locations with minimal land for lagoon construction.

#### Undersea Unexploded Ordnance (UXO) Characterization

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



#### Sustainable Depot and Ammunition Operations

Assisting Army Depots and Ammunition Plants with achieving more sustainable operations. For Radford Army Ammunition Plant, we conducted a proof-of-concept technology demonstration that resulted in 97% nitrate removal from wastewater. For Letterkenny Army Depot, we demonstrated a 90% effective cadmium removal treatment process for its industrial wastewater treatment plant.

#### Virginia Storm Sewer System Permitting Evaluation Pilot

Assisting Arlington National Cemetery (ANC) in complying with the new Virginia Small Municipal Separate Storm Sewer System (MS4) General Permit, applicable to installations in the state's urban areas. We are developing an MS4 Program Plan, Nutrient Management Plan, and Storm Water Pollution Prevention Plans. We are also piloting a Storm Water System Delineation Methodology for evaluating ANC's storm sewer system.



## Water Compliance

### Watershed/Stormwater Management

- Develop collection tools and conduct baseline assessments
- Perform hydrological profiles and flow path analyses
- Calculate nutrient loads
- Evaluate technical solutions for point and nonpoint sources
- Develop implementation plans
- Create BMP concept designs
- Evaluate compliance alternatives
- Provide permitting assistance
- Develop guidance and training

### Next-Generation Process/Water Resource Recovery Technologies

- Scout, test, demonstrate, and implement technologies
- Develop and conduct training

# Quantity

## Water Conservation Highlights

### Shower & Laundry Water Reuse

Designed a deployable energy-efficient system that treats shower water, recovering over 90% of the water for non-potable applications. We will be demonstrating the system in 2014 at Camp Buehring, an enduring base camp in Kuwait that must truck in its water. We also are supporting Navy efforts to disinfect and recycle laundry water in Djibouti, Africa.



### Water Balance Model & Roadmaps

Developed and applied a Water Balance Model to quantify water supplied and water usage at Fort Detrick and Forest Glen Annex. We then analyzed the effectiveness of water conservation, recycling, and reuse technologies, procedures and techniques. In 2014, we will complete Net Zero Water Roadmaps that outline a time-phased approach for potential demonstration, implementation, and achievement of Net Zero water goals using recommended water project technologies.

### Water Security Assessments & Net Zero Plans

Aiding Army pilot sites with achieving Net Zero energy, water, or waste goals. Fort Bliss is striving to be Net Zero in all three areas by 2020. For Fort Bliss, we developed and tested an unclassified water security approach. We also produced an integrated Net Zero plan addressing all three resources so recommended actions can be implemented based on budgets, personnel limitations and other factors.



*For more than 20 years, the NDCEE has been identifying, demonstrating, evaluating, and fielding technologies in support of DoD readiness, sustainability, and the Warfighter. The above project descriptions are examples of recent activities. Over the years, our water-related technology investigations have addressed topics such as leak detection; ground and surface remediation associated with explosives, volatile organic compounds, and other contaminants; plating and other water-based bath operations; nutrient removal; and vegetative roofs and other rainwater capture systems.*

## Water Conservation

### Water Balance Analysis

- Inventory all water-using activities, baseline water usage
- Balance water use with wastewater discharge, calculate system losses
- Identify water conservation & reuse options

### Water Security & Vulnerability Assessments

- Develop unclassified energy and water security assessment protocols
- Identify energy and water security concerns
- Address interdependencies and mutual influences of energy and water
- Recommend mitigation security solutions
- Develop integrated approaches for installations to achieve Net Zero goals

### Water Recycling & Reuse

- Engineer from state-of-the-art potable water materials and components
- Couple solutions to renewable energy resources
- Conduct outreach and awareness



# Quality

## Your Water Decisions Matter

Water has often been easy to take for granted. We turn on the tap and out pours plenty of clean, cheap, drinkable water. But water concerns are rising as droughts hit, groundwater becomes depleted, and saltwater or other additives contaminate fresh water supplies. Water is a critical and fundamental component of our nation's security, economy, and way of life. By finding opportunities to increase water efficiency and protect our water, you are helping to implement long-term water resource solutions.

- Are water shortages affecting your organization?
- Is water quality an issue?
- Is water security a concern?
- Are water conservation opportunities being pursued?
- Are water recovery/reuse solutions needed?
- Does your organization need permit or other regulatory assistance?
- Is assistance needed to reduce pollutant runoff into waterways?
- Are ground or surface water remediation solutions needed?
- Does your organization know which activities are consuming water and how much?
- Have Net Zero water goals been created?
- How are candidate technologies and processes being evaluated to ensure cost and technical effectiveness?

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*How may we help you optimize your water supply and quality to meet mission requirements?*

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