Secretary of Defense Environmental Award Fiscal Year 2013

Joint Expeditionary Base Little Creek-Fort Story, Virginia Beach, Virginia

Environmental Restoration – Individual/Team

INTRODUCTION

On October 1, 2009, Hampton Roads, Virginia's, first Joint Base was established. This Joint Base comprises the former Naval Amphibious Base (NAVPHIBASE) Little Creek (commissioned in 1945), now known as Joint Expeditionary Base (JEB) Little Creek and former Army Garrison of Fort Story (established in 1914), now known as JEB Fort Story (*Figure 1*). Together, JEB Little Creek-Fort Story is the major east-coast operating base supporting Overseas Contingency Operations, contributing to maximum military readiness by providing sustained superior service. Resident commands provide front-line support personnel (such as Sea, Air, Land (SEAL) Teams, Explosive Ordnance Disposal [EOD], and Riverine Squadrons), and the training venues that hone the skills of those front-line operators. JEB Little Creek-Fort Story provides support and services to 155 shore-based resident commands and 18 home-ported ships. This joint base also consists of nearly 4,000 acres of land and more than 7.5 miles of beachfront training area with 58 piers. It is the only bare-beach

Figure 1 - Joint Expeditionary Base Little Creek-Fort Story

Figure 2 - Joint Expeditionary Base Little Creek-Fort Story Location

Joint Logistics Over-The-Shore training site within the Department of Defense (DoD), is home to the only east coast Advanced EOD Training facility, and meets nearly all Department of the Navy (Navy) Special Warfare training requirements.

JEB Little Creek-Fort Story is in the Atlantic Coastal Plain within the Tidewater Region of southeast Virginia (*Figure 2*), occupying approximately 3,915 acres within the Chesapeake Bay watershed. Both facilities and the surrounding area are used for industrial, recreational, commercial, and residential purposes. The terrain within and adjacent to the facility is low-lying and relatively flat and contains several freshwater lakes and saltwater bodies. JEB Little Creek-Fort Story is also adjacent to the Chesapeake Bay, a substantial source of recreational opportunities and commercial

industry, which is also North America's largest and most biologically diverse estuary. Recreational and commercial fishing are vital activities within the bay.

BACKGROUND

Program Summary

Comprehensive environmental restoration (ER) activities at JEB Little Creek began in 1984 under the Navy Assessment and Control of Installation Pollutants (NACIP) and Installation Restoration (IR) programs, later termed the Navy Environmental Restoration Program (NERP). The NACIP program was changed in 1986 to reflect the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act. On May 10, 1999, JEB Little Creek was placed on the National Priorities List (NPL) with the United States Environmental Protection Agency (USEPA) designated as the lead regulatory agency; a Federal Facility Agreement (FFA) was finalized in October 2003. JEB Fort Story was not placed on the NPL; however, a restoration program was developed by the Army in 1987 to address contamination from past waste management practices. Current actions being taken under the NERP at JEB Fort Story are conducted under CERCLA with the Virginia Department of Environmental Quality (VDEQ) designated as the support regulatory agency. With the joining of the facilities in 2009, the Navy assumed responsibility for managing both properties. Because JEB Little Creek is listed on the NPL and JEB Fort Story is not, Naval Facilities Engineering Command (NAVFAC) team members and supporting members agreed the programs would be maintained separately, but that community involvement activities concerning both programs would be merged.

Team

Program management for the NERP at JEBLCFS is conducted through the Hampton Roads Integrated Product Team within NAVFAC, Mid-Atlantic Division (MIDLANT). Mr. Bryan Peed, the Remedial Project Manager, is supported by technical, acquisition, and legal professionals across the NAVFAC MIDLANT organization, as well as the Tier I Partnering Team composed of personnel from the Navy, USEPA, VDEQ, and environmental consulting firms (*Table 1*).

Table 1

NAVFAC	**Mr. Bryan Peed** Joint Expeditionary Base (JEB) Little Creek-Fort Story Remedial Project Manager (RPM) **Ms. Sharon Waligora** Environmental Division Director, JEB Little Creek-Fort Story Public Works Department (PWD)
DEQ Virginia Department of Environmental Quality	**Mr. Paul Herman, P.E.** Virginia Department of Environmental Quality (VDEQ) JEB Little Creek RPM **Mr. Wade Smith** VDEQ JEB Fort Story RPM
United States Environmental Protection Agency	**Mr. Jeffrey Boylan** United States Envionmental Protection Agency (USEPA) JEB Little Creek RPM
CH2MHILL	**Ms. Cecilia Landin** JEB Little Creek-Fort Story Activity Manager **Mr. Nathaniel Price, P.E.** JEB Little Creek-Fort Story Project Manager

POSITION DESCRIPTION

The goal for the NERP is to implement innovative, site-specific remedial actions (RAs) to protect human health and the environment. The Tier I Partnering Team is committed to working together and communicat-ing openly to identify and cleanup ER sites in a timely, innovative, and cost-effective manner. The Team works under the guidance and tutelage of the Tier II Partnering Team, which consists of representatives of their respective agencies. The Partnering Teams' decision to concentrate on innovative remedial techniques and restoration has resulted in maximum protection of human and ecological resources while minimizing impacts to military readiness and civil works missions. The fundamental Team goal is to protect human health and the environment. The Team organized in 1999 and meets every 6 to 10 weeks. Despite personnel fluctuations

over the years, the Team has continued to be successful in meeting fundamental goals without third-party facilitation. The partnering process provides open discussion and communication with Team members, increased production, and decreased document review and comment time periods.

Using partnering principles, the Team, in collaboration with the Public Works Department (PWD), effectively employs the CERCLA process to reduce risks to human health and the environment while increasing site utilization. The Team is ahead of schedule to achieve the goal of attaining remedies in place for all sites by Fiscal Year (FY) 2015, with the potential to meet this goal in the second quarter of FY 2014. Over the past two FYs, using sound management practices, the Team has made outstanding progress, including completion of the following listed in *Table 2*.

Table 2

Action Document	Number Completed During Achievement Period
Land Use Control Remedial Design	1
Remedial Action Design	1
Record of Decision	1
Engineering Evaluation/Cost Analysis	2
Action Memorandum	3
Remedial or Removal Action Work Plan	2
Construction Summary Memorandum	2
Interim Remedial Action Completion Report	2
Remedial Action Completion Report	1

The key challenge for the Partnering Team during this achievement period was the development of closeout strategies for the remaining sites, which are the most complex because of the physical characteristics and type of contaminated media.

While working to protect human health and the environment, the Navy works to meet small and disadvantage business goals. Small businesses work with the JEB Little Creek-Fort Story NERP through both prime contractor and subcontractor opportunities. During the achievement period, the Navy compensated more than $185,000 for RA construction activities to the Native American- and woman-owned small disadvantaged business, Osage of Virginia. Additionally, the Navy compensated more than $100,000 for operations and maintenance (O&M) activities to Service Disabled Contracting Group, Inc. In addition to prime contract opportunities, the Navy's large business contractor, CH2M HILL, awarded subcontracts for JEBLC of more than $180,000 to small businesses in support of the Navy meeting its small business goals.

ACCOMPLISHMENTS

Accelerated Environmental Cleanup

Following placement on the NPL and finalization of the JEB Little Creek FFA in October 2003, 10 IR sites were identified as requiring investigation and potential RA. Today, only one of the 10 originally listed sites remains under investigation. Upon the transfer of the former Army Garrison of Fort Story to the Navy, the NERP acquired 11 additional IR sites. Presently, all IR sites at JEB Fort Story have signed decision documents (nine with no further action and two with long-term monitoring [LTM] as the final remedy).

As a whole, the JEB Little Creek-Fort Story Team completed construction of one RA and two non-time-critical removal actions (NTCRAs), initiated a time-critical removal action (TCRA), and established no further action for one site and a remedy-in-place (RIP) for three sites during this achievement period. The Team has worked together to accelerate environmental cleanup and is on track to achieve facility construction completion approximately 18 months ahead of the Navy's FY 2015 goal. During this achievement period, approximately 103 acres have been made available for potential reuse. Of the 103 acres, 53 acres have no land use restrictions and 50 acres have land use controls.

Achieved RIP for IR Site 11a in September 2013: Achievement of this milestone in FY 2013 was possible due to the Team's previous experience and success with the treatment of volatile organic compounds (VOCs) via Enhanced Reductive Dechlorination (ERD) remedial technology and their ability to utilize only 6 of 12 months of

post-remedy implementation data to conclude the remedy was in place and functioning as designed. RIP was accelerated at the site in excess of one year.

Completed the NTCRAs at IR Solid Waste Management Unit (SWMU) 3 and SWMU 7b: The NTCRAs for SWMU 3 and SWMU 7b, consisting of sediment removal via dredging (*Figure 3*), were initiated in February 2013. Following the accelerated completion of a Sampling and Analysis Plan and investigation activities for removal boundary pre-confirmation sampling, two Engineering Evaluation/Cost Analyses, two Action Memorandums, and work plan documents were completed between April 2012 and February 2013. The Team worked collectively to accelerate the removal action activities to allow for the utilization of dredge equipment mobilized to the facility for contracted FY 2013 maintenance dredging. The accelerated schedule would also allow for completion of the action during scheduled removal and maintenance of the dry dock located within the SWMU 3 boundary, resulting in a significant cost savings (see *Partnerships Addressing Environmental Restoration Issues between DoD and other Entities*, as follows). The NTCRA was completed in May 2013, with the accelerated schedule saving more than 2 years of continued investigation and RA. Following completion of the NTCRAs, a no further action Record of Decision (ROD) was signed for SWMU 7b.

Initiated the TCRA for IR SWMU 3 in September 2013: Following completion of the NTCRA at SWMU 3, the Team recognized the need for continued removal activities to prevent re-contamination of the NTCRA area that may result from significant storm activity. The Team worked to develop a site closeout strategy utilizing both the mechanical removal of site media as well as innovative treatment technologies (see *Innovative Technology Demonstration and Validation and Implementation*, as follows) for the remediation of metals in the sediment portion of the site. The TCRA is anticipated to be completed in January 2014, and a ROD outlining no further action for soil, sediment, and surface water is scheduled for March 2014.

Innovative Technology Demonstration/Validation and Implementation

SWMU 3 TCRA: The remediation of sediment at SWMU 3 met with various challenges that made removal of all impacted media difficult to implement without the use of significant funding and disruption to JEB Little Creek's mission with respect to the Morale, Welfare, and Recreation (MWR) activities associated with the adjacent marina. Although the implementation of a dredge removal action was possible across most of the site, various areas of the site were inaccessible due to proximity to bulkheads and piers, without the use of engineering controls such as sheet piling or complete demolition and rebuilding. Through open discussion between the Team, including the EPA Biological Technical Assistance Group, a site closeout strategy was

Figure 3 - SWMU 3 and SWMU 7b Removal Action Activities

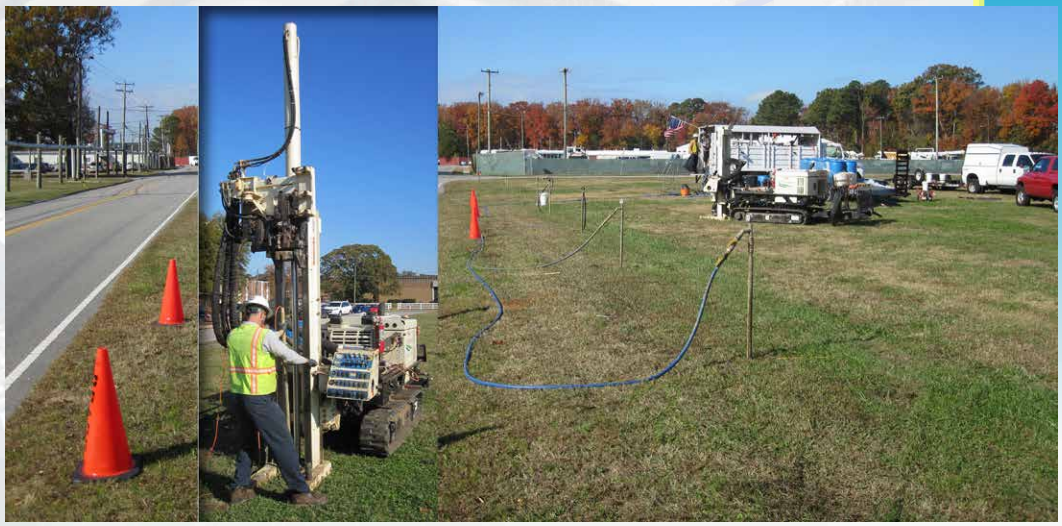
developed for SWMU 3 that utilizes a treatment technology to address contamination in these areas. Through the placement of powdered activated carbon (PAC), delivered to the sediment surface as part of a dense granular aggregate (AquaGate+PAC), the bioavailability of sediment contaminants will be reduced in the upper biologically active zone, which is the primary source of exposure to benthic organisms and the water column. The addition of the amendment will sequester contaminants in the sediment that would otherwise enter pore water through dissolution. The use of amendments to actively sequester contaminants in sediment is less energy-intensive, less expensive, and less disruptive than conventional remediation technologies such as dredging. Unlike a capping technology, use of the amendment will not require post-placement maintenance. The TCRA was initiated in October 2013 and is expected to be completed in January 2014. Following completion of the TCRA, no further action for sediment will be required.

IR Site 11a RA: Based on an evaluation of the site characteristics of Site 11a, the Former Vehicle Repair Facility and Waste Oil Tank, and the successful implementation of RAs to treat VOCs in groundwater at Sites 11, 12, and 13 via ERD, the Team implemented ERD as the remedy for Site 11a. Reductive dechlorination is a naturally occurring, microbially mediated, anaerobic process that requires very specific site conditions to facilitate optimal degradation of the contaminants. To implement the RA at Site 11a, emulsified vegetable oil, sodium bicarbonate, and potable water were pumped into the aquifer (*Figure 4*) to enable the naturally occurring microbes to accelerate the degradation of contaminants within the groundwater.

Partnerships Addressing Environmental Restoration Issues between DoD and other Entities

Through the formation of the JEB Little Creek Restoration Advisory Board (RAB) in 1994, the Team has continued to educate the community about ER activities at JEB Little Creek and encourage community involvement in the decision-making process. In addition to the Tier I Team members, the Executive Officer serves as the senior Navy official at the RAB meetings. The Team's forthright conveyance of site status information through annual RAB meetings has fostered a positive relationship with the community. As the RAB has evolved, the commitment of the community to environmental stewardship has remained constant, with two of the original RAB members still serving as active participants over the last 16 years. Public RAB members vocalize their support and have provided positive feedback on the Navy's initiative to implement RAs in protection of human health and the environment, using innovative management approaches, and the institution of better business manage¬ment processes. In addition to community involvement in RAB meetings, the Team has interacted with the community through a JEB Little Creek-Fort Story public website, an information repository housed at a local library, and the presentation of documents at public meetings.

Figure 4 - Site 11a Remedial Action Activities



NAVFAC, in partnership with USEPA and VDEQ, collaborates with the PWD to ensure NERP is being successfully implemented at JEB Little Creek-Fort Story while maintaining military readiness. NERP weekly updates are provided to the PWD and subsequently to the mission command to ensure open communication. The Commander, Deputy Commander, Executive Officer, and the Public Affairs Officer actively support the NERP, are routinely briefed on ongoing restoration activities, and are active participants in the RAB.

NTCRAs at SWMU 3 and SWMU 7b: Communication with military construction, dry dock, harbor, and MWR personnel has been ongoing during the development of remedial strategies to address sediment at SWMU 3 and SWMU 7b. This continued collaboration ensures that the strategies evaluated by the Team will reduce risks to the environment to the greatest extent practicable, are cost-effective, and will cause minimal to no impact to military readiness. Through this open communication, the Team was made aware of scheduled FY 2013 facility activities, including maintenance dredging and a routine movement and rehabilitation of the dry dock located within the SWMU 3 boundary. Within a year of learning of planned facility activities, the Team worked to aggressively develop site strategies (see *Accelerated Environmental Cleanup*, as follows), which resulted in a cost savings of approximately $1.9 million, eliminating the need to mobilize dredge equipment to the site, coordinate with the Federal Aviation Administration for temporary closure of the Norfolk Airport during movement of the dry dock, or temporarily cease dry dock operations, thus, alleviating a temporary decline in military readiness.

The NERP at JEB Little Creek-Fort Story is an example of what can be accomplished when the military works as partners within its different divisions as well as with regulatory agencies and the community to support military readiness, while ensuring protection of human health and the environment.

Reducing Risk to Human Health and the Environment

Protecting human health and the environment is at the forefront of all Team decision-making when remediating sites at JEB Little Creek-Fort Story. When selecting site remedies, the Navy collaborates with the Team to evaluate the needs of the community, the NERP, and the mission to apply the most economical, environmentally sound, and sustainable methodologies to the issues under examination.

IR Site 11 Groundwater Contaminants: Remedial implementation at Site 11 was completed in 2009 and has since been followed by RA-Operation, including groundwater and vapor intrusion LTM. The Team believes that the commitment to protect human health and the environment extends beyond the selection of a remedy. To provide continued protection to building occupants, the Team developed a monitoring plan in 2012 for evaluating potential risks from vapor intrusion during the remediation of groundwater. The plan was developed with optimization components allowing the number of buildings evaluated and samples collected to be reduced as the groundwater plume footprint was minimized. In an effort to communicate with the public, fact sheets outlining the "Who, What, Where, When, and Why" of vapor intrusion sampling were distributed to building occupants (*Figure 5*). Since implementation of the remedy, a 28 percent reduction in total contaminant of concern (COC) concentrations has been recognized.

Figure 5 - Site 11a Vapor Intrusion Sampling Brochure

IR Site 12 Groundwater Contaminants: Remedial implementation at Site 12 was completed in 2007 and has since been followed by RA-Operation, including two subsequent rounds of injections to maintain system performance. Data collected as part of the March 2013 Five-year Review sampling event indicate a 98 percent reduction in total tetrachloroethene (PCE) concentrations (PCE is the primary

site COC [*Figure 6*]). An overall reduction in total COC concentrations of 84 percent has also been recognized. IR SWMU 3 and SWMU 7b NTCRA: NTCRAs were completed at SWMU 3 and SWMU 7b in February 2013 to address potential ecological risks from exposure to metals in sediment. Approximately 16,640 cubic yards of sediment was collectively removed from both sites (*Figure 3*). Following sediment removal, the sites were restored through the placement of clean sand to foster the growth of a healthy benthic invertebrate community. Following the NTCRAs, a no further action ROD was signed for SWMU 7b. Additional removal activities are currently underway at SWMU 3 (see *Accelerated Environmental Cleanup*, as follows).

Green Remediation

The JEB Little Creek-Fort Story Team has sought to implement sustainable remedial solutions by using green remedial technologies and available resources. The ERD RAs at Sites 11a, 11, 12, and 13 utilize a vegetable oil substrate to enhance the natural microbial populations in groundwater, resulting in the enhanced degradation of COCs. The systems treat the contaminants in situ and, with the exception of the material for injection system construction and the injections themselves, do not require additional energy consumption to further degrade contaminants.

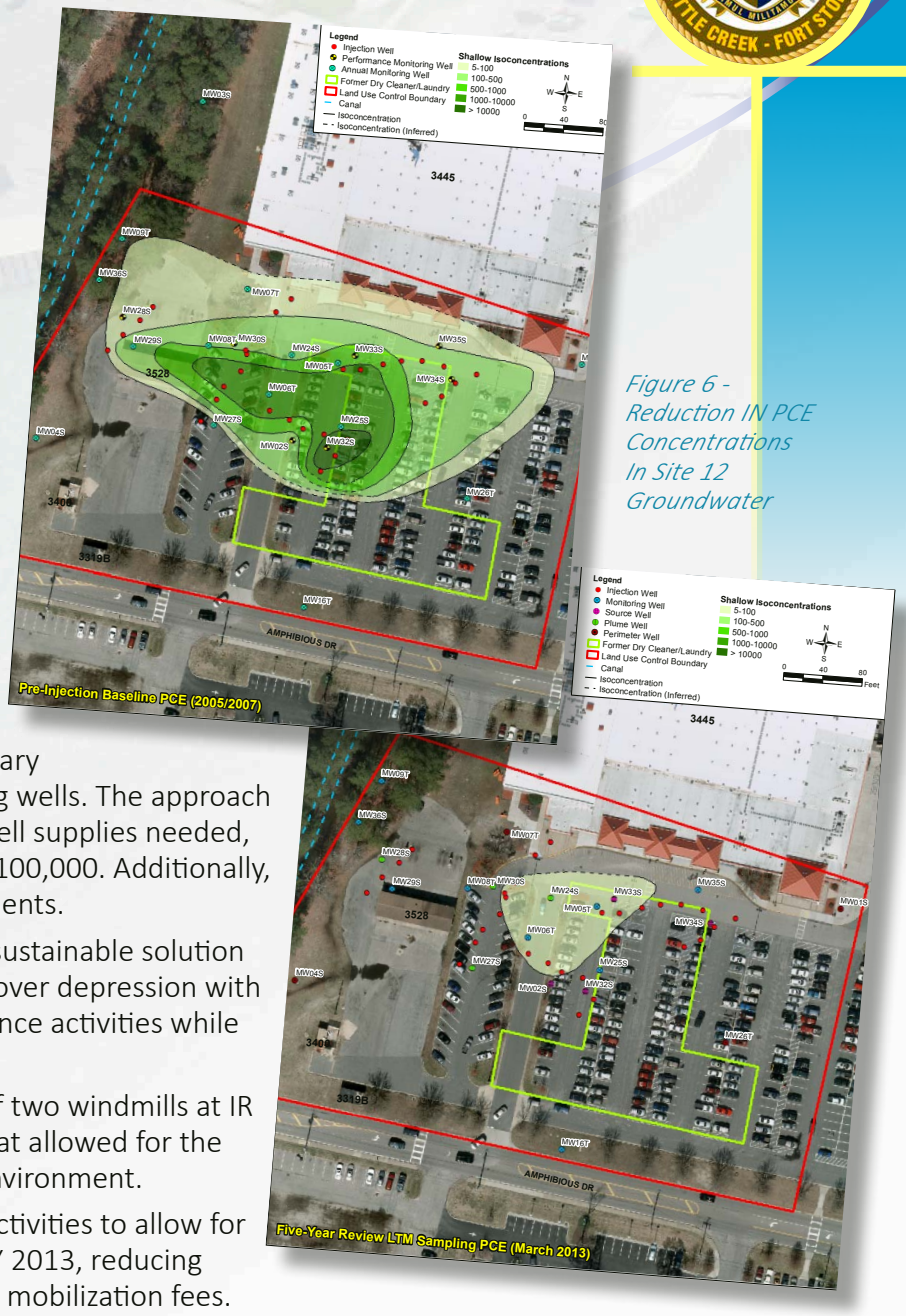


Figure 6 - Reduction IN PCE Concentrations In Site 12 Groundwater

IR Site 11a RA: During development of the remedial design for Site 11a, the Team collaborated to design a more sustainable remedy for treatment of the low concentration VOCs at the site. Because the Team recognized that multiple injections may not be required to reach site cleanup goals, remedy implementation utilized temporary injection points as opposed to the installation of approximately 45 permanent monitoring wells. The approach reduced the overall carbon footprint of remedy construction, through the reduction in well supplies needed, equipment operation, and waste generation, and was able to save the Navy more than $100,000. Additionally, the duration of remedy construction was limited, minimizing the impact to barracks residents.

IR Site 7 O&M: During implementation of O&M activities at Site 7, the Team identified a sustainable solution for the reuse of soil cover removed for the construction of a drainage swale to fill a soil cover depression with exposed waste. This material reuse reduced the overall carbon footprint of the maintenance activities while saving the Navy approximately $4,000.

IR Site 9 Windmill Installation: The Team collaborated with the PWD for the installation of two windmills at IR Site 9. Through Team discussion, the entities were able to develop a construction plan that allowed for the generation of green energy while maintaining the protection of human health and the environment.

IR SWMU 3 and 7b NTCRAs: The Team worked collectively to accelerate removal action activities to allow for the removal actions to utilize dredge equipment previously mobilized to the facility for FY 2013, reducing the overall carbon footprint of the action and saving the Navy approximately $400,000 in mobilization fees.