MCAS Cherry Point

Secretary of Defense Environmental Awards
Fiscal Year 2012 – Environmental Restoration, Installation
Marine Corps Air Station, Cherry Point, North Carolina

CONTENTS

INTRODUCTION

Commissioned in 1942, Marine Corps Air Station Cherry Point initially served as a training base for Marines bound for the World War II Pacific Theater.

MCAS Cherry Point is surrounded on three sides by the environmentally sensitive Neuse River estuary system.

Today, Marine Corps Air Station (MCAS) Cherry Point is home to over 9,500 Marines and sailors and 5,300 civilian employees and hosts the 2nd Marine Aircraft Wing (2dMAW), including 10 flying squadrons and various ground support elements and the Fleet Readiness Center East, Eastern North Carolina's largest industrial facility. Cherry Point continues to play a vital role in the economic stability of Eastern North Carolina, significantly contributing to the economic health of the entire state with an overall economic impact of $2.05 billion during FY2011.

Cherry Point operates the BT-9 and BT-11 air-to-ground target range complexes and the Mid-Atlantic Electronic Warfare Range, all of which are vitally important to the training missions of each of the military service branches. MCAS Cherry Point also operates a squadron of search and rescue (SAR) helicopters that, in addition to supporting the military training mission, provide fire fighting, medical evacuation, and regional community SAR support.

Cherry Point covers 13,164 acres with an additional 15,980 acres in outlying support areas. MCAS Cherry Point is surrounded on three sides by the environmentally sensitive waters of the Neuse River watershed. The estuarine environment serves as habitat for many species of migratory birds and as a nursery for coastal shore birds and marine life.

BACKGROUND

Overcome Cleanup Challenges

Cherry Point's Environmental Restoration (ER) team faces significant cleanup challenges stemming primarily from historical activities in the industrial heart of the Air Station. Standard industrial practices for the handling and disposal of chemicals, wastes, and fuels resulted in several extensive contaminant plumes and numerous waste disposal sites.

Several of Cherry Point's cleanup sites are extremely large and complex. The central industrial area includes four active runways, aircraft hangers and support facilities, an extensive belowground aviation fueling pipeline network, and the Navy's Fleet Readiness Center-East (FRCE); a large industrial aircraft rework facility.

Restoration activities in Cherry Point's highly congested industrial area require careful coordination to limit impacts on production and avoid damage to utilities and infrastructure.

The central industrial area alone encompasses more than 1,000 acres and includes a sizeable grouping of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, numerous underground storage tank (UST) petroleum release sites, and several Resource Conservation and Recovery Act (RCRA) Solid Waste Management Units (SWMUs). The two largest Operable Units (OUs), OU1 and OU14, together encompass the FRCE as well as a significant portion of the flight line area and is situated over several large comingled contaminant groundwater plumes. Cherry Point is also addressing a World War II era bombing target under the Navy's Munitions Response Program (MPR).

MCAS Cherry Point's hydrogeological and ecological settings create unique resource protection and human health concerns. The Air Station and several nearby municipalities rely on the groundwater underlying the facility for their drinking water supply. In addition, Cherry Point and its outlying fields are located in the environmentally sensitive coastal plain of North Carolina and the surrounding estuarine environment is vitally important to the local fishing industry.

During FY 2011 and 2012, over 130 construction and maintenance projects were implemented with many conducted in the central industrial area. Each project is closely tracked and reviewed by the restoration team to ensure that contractors are advised of the presence of contamination and worker exposure is minimized. Effective implementation and oversight of remedial and construction projects is critical to ensure the protection of sensitive receptors such as wetlands, surface water bodies, and groundwater aquifers including the regions' primary drinking water aquifer.

Work as a Team

MCAS Cherry Point's Restoration Division (RRD) is staffed with three engineers, one chemist, and two environmental scientists. Management responsibilities for individual restoration sites are assigned according to the site's primary regulating program: CERCLA, RCRA, MRP, or UST. Cherry Point's restoration program managers work closely with and enjoy tremendous support from the Naval Facilities Engineering Command (NAVFAC) North Carolina Integrated Product Team based in Norfolk, Virginia. All work together within the framework of the Air Station's Federal Facility Agreement and environmental management system (EMS) to ensure continuous improvement in the cleanup processes.

The Air Station's restoration team strives for and maintains an open and trusting relationship with the regulatory agencies and public. Managers are empowered to pursue open dialogue with State and federal regulatory agencies to solve technical, political, and regulatory issues and keep the local community involved in the decision-making process.

Internally, the RRD has adopted a team approach in order to effectively integrate the various regulatory programs. Staff members work closely together to share ideas and prioritize sites based on regulatory

requirements and funding availability. Major cross program issues such as management of contaminated media during civil construction projects and monitoring well management are assigned to a single program manager to ensure that policies and standards are consistently applied.

Involve Our Community

Cherry Point enthusiastically seeks community involvement in the restoration decision-making process. In 1996, the Technical Review Committee converted to a Restoration Advisory Board (RAB) with three charter members still active after 17 years of service! The RAB meets regularly and recently added a community member with environmental credentials.

To improve community participation and foster an atmosphere of openness and trust, the Air Station:

- Held regular RAB public meetings to discuss Cherry Point's restoration progress and direction;
- Met with local community leaders and conducted local media interviews to inform and discuss ER issues such as the Community Involvement Plan update and MRP activities at the former Bombing Target 2;
- Conducted community interviews to gauge public interest and solicit input into ongoing ER activities and progress, the Community Involvement Plan update, and the MRP Public Involvement Plan;
- Updated the RAB Resource Manual to provide ready reference information for RAB members and the public; and
- Recognized the RAB's 15 year anniversary and honor the members for their combined total of more than 100 years of service to the Air Station and the community.

Focus on Results

The Cherry Point's restoration team strives to maintain focus and forward progress. During fiscal years 2011 and 2012, the restoration team has:

- Executed two Records of Decision, seven Decision Documents, and five Corrective Action Plans;
- Finalized five Remedial Investigations and two Vapor Intrusion Investigations;
- Achieved twenty site closures at two CERCLA, twelve UST, and six RCRA sites;
- Assessed 32 restoration sites at six CERCLA, one MRP, twelve RCRA, and thirteen UST sites;
- Developed or modified seven remedies at one CERCLA, one RCRA, and five UST sites;
- Completed 31 removal actions at six CERCLA, two MRP, ten RCRA, and thirteen UST sites;
- Conducted range surface debris removal actions at two operational ranges;
- Initiated an update of the Public Involvement Plan for the Munitions Response Program; and
- Updated the Community Involvement Plan, UST Management Plan, and RAB Resource Manual.

PROGRAM SUMMARY

MCAS Cherry Point's restoration objectives are aligned with the statutory Defense Environmental Restoration Program (DERP) goals of "correcting environmental damage that creates an imminent and substantial endangerment to the public health or welfare or to the environment." The Cherry Point RRD seeks to achieve these goals in a technically sound, timely, and cost-effective manner. To this end, the Cherry Point restoration team has the following objectives:

- *Prevent unacceptable risks to human health and the environment:* With many of the more than 130 construction and maintenance projects being conducted in the central industrial area; an area of known contamination, each project is closely tracked and reviewed by the restoration team to ensure that contractors are advised of the presence of contamination and worker exposure is minimized. Additionally, effective oversight of construction projects is critical to ensure the protection of groundwater aquifers and drinking water supplies by ensuring no contaminants migrate into lower aquifers.

  To prevent potential unacceptable risks to human health and the environment, select drinking water and industrial water supply wells

located within the industrial area were removed early in the restoration timeframe. In 2011, the Air Station sealed five inactive potable water wells located near active restoration sites eliminating potential conduits for contaminants to migrate to lower groundwater aquifers. Periodic sampling is also conducted to ensure contaminants have not migrated into the drinking water aquifer.

- *Meet regulatory requirements and deadlines:* By keeping open the lines of communication with State and federal regulators, Cherry Point restoration managers have been able to maintain tight regulatory review schedules while processing more than 450 restoration documents; an increase of more than 50 documents over the previous two-year cycle.
- *Use teamwork to share successful cleanup strategies that can be applied across regulatory programs:* The Air Station CERCLA program was able to consider UST groundwater remedial efforts when evaluating potential groundwater remedies at remedial sites. By considering potential benefits of existing UST remedial systems and the CERCLA/UST 'Comingle Plume' agreement, the Navy was able to avoid implementing competing groundwater remedies.
- *Maximize innovative management approaches to support the installation's mission, reduce costs, increase small business participation, and close sites:* When petroleum contaminated soil unexpectedly showed up during construction of several military family housing units, the restoration team quickly went into action. Working closely with the Navy's Public Private Venture (PPV) Housing contractor, funds were expedited and coordinated through the Naval Facilities Engineering Command (NAVFAC) to utilize an existing small business contract to conduct an investigation of each site. Working with the State regulators, the Air Station obtained agreements for six individual site cleanups and effectively remediated all six sites to clean closure allowing construction to proceed.

When petroleum contamination unexpectedly turned up during military family housing construction, Cherry Point restoration team facilitated State involvement and working closely with NAVFAC and PPV Housing contractor, was able to fast-tracked site assessment and achieve clean closure with minimum impact to construction schedules.

- *Improve relations with the community and the regulators by fostering an atmosphere of openness and trust*, MCAS Cherry Point and NAVFAC in partnership with the State and EPA have conducted public notification activities prior to a Munitions Response Program effort to install warning signs around Bombing Target 2. These activities included mailed fact sheets to area residents, media releases, news articles, and a Notice to Mariners by the U.S. Coast Guard. Cherry Point and the Navy maintained opened communication with the public and RAB to ensure MRP efforts were conducted with no adverse public reaction.

ACCOMPLISHMENTS

Cherry Point's success in meeting its cleanup program objectives is built upon numerous innovative initiatives. Although the benefits of individual initiatives are sometimes difficult to quantify, the cumulative impact over the years is often dramatic.

For example, when it became apparent that the major source of an extensive groundwater contaminant plume lay directly below a large mission-critical building within the heart of the heavily industrialized FRCE complex, the restoration team determined that the standard treatment options were not viable due to confined work areas, extensive subsurface infrastructure, and the potential for vapor intrusion into buildings. The restoration team in partnership with the EPA and State developed an innovative two-zone in-situ treatment remedy to address near-source dissolved phase contaminants adjacent to the FRCE and the extensive down-gradient groundwater contamination. The innovative two-zone remedial treatment will reduce contaminant concentrations by as much as 90% and prevent groundwater exceeding State surface water standards from discharging into the environmentally sensitive Slocum Creek aquatic system.

Support the Mission

The Air Station's cleanup team continuously seeks to better support the installation mission while accomplishing restoration tasks through the use of innovative management and remedial technology.

Reduced Footprint: The restoration team takes great care to reduce the impact of cleanup activities on facility operations. This is particularly important within the heavily industrialize FRCE where the high workload tempo necessary to repair the aircraft and equipment returning from the battlefields of Iraq and Afghanistan make production schedules acutely sensitive to disruption by restoration activities. The cleanup team routinely schedules restoration work on the less hectic third shift and actively seeks out innovative technologies that will minimize the footprint of the restoration program and reduce the disruption caused by the cleanup work.

Monitoring Well Management: To facilitate project construction while maintaining compliance with State groundwater regulations, the restoration team work together to identify and track monitoring wells networks within construction project areas.

When a major military construction (MILCON) was awarded to renovate an extensive aircraft hanger, the restoration team was able to utilize the Well Management Database and the Geographic Information System (GIS) to identify more than 50 groundwater monitoring and petroleum remediation wells located within the project footprint. To reduce unnecessary project costs, the restoration team categorized wells impacted by the project as either to be replaced or protected. Only those wells determined to be at imminent risk of damage are abandoned during the demolition phase. Wells determined to be protected are marked accordingly thereby avoiding costly replacement. Throughout the project's multiyear schedule, the team provided guidance to Navy and contractors facilitating construction efforts and helping control project costs.

Monitoring well installations are scheduled to have minimum impact to unit operations. This can be especially critical during high-tempo military operations or in tight work spaces.

Cathodic System Project Support: Cherry Point's restoration managers regularly provide construction project support. During a 2012 steam system cathodic protection project, the restoration team provided technical expertise to ensure the 110-foot deep cathodic wells were properly designed, located, and constructed to address aquifer cross-

contaminant migration and comply with State well regulations.

The project design initial called for locating six cathodic wells in areas of known groundwater contamination at depths penetrating the base's primary drinking water aquifer. Standard cathodic well construction using coke breeze was deemed insufficient to prevent aquifer cross-contamination. The wells were redesigned using an innovated proprietary grout material with low permeability properties that would prevent cross-contamination but still provide ample electrically conductivity; a requirement for proper operation. The design was also modified to allow shallower well construction to prevent penetrating the drinking water aquifer

Innovative Technology/Reduced Risk

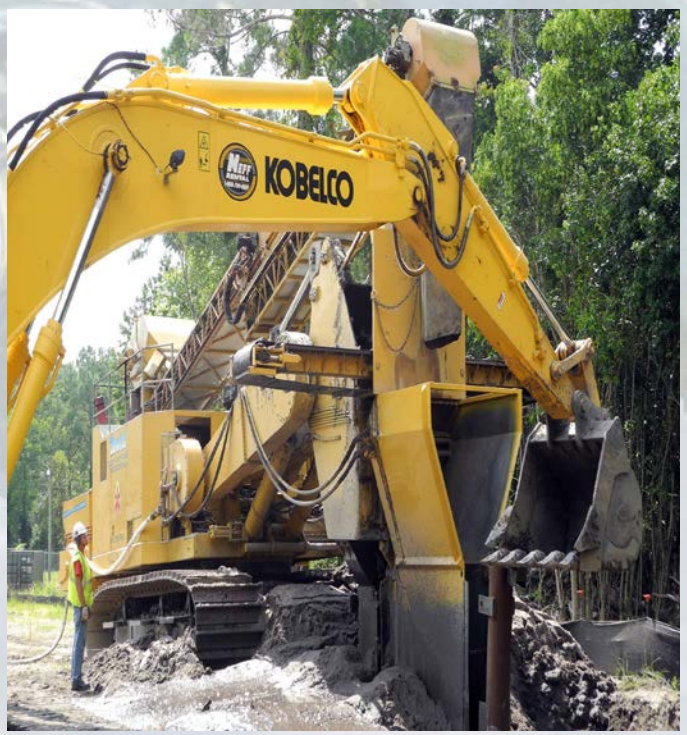
In-situ Groundwater Remediation: MCAS Cherry Point implemented a Permeable Reactive Barrier (PRB) Pilot Study using Zero Valent Iron (ZVI). The ZVI PRB is an innovative in-situ groundwater treatment system that reduces a wide range of dissolved chlorinated solvents in groundwater without generating toxic daughter products. The team conducted a bench-scale ZVI column study to develop a full-scale treatment zone designed to achieve a 90 percent reduction in contaminant concentration.

Over 700 tons of reactive medium ZVI was utilized to construct the 600-foot long, 35-foot deep permeable barrier. The primary objective of the two-year pilot study is to achieve a 90 percent reduction of trichloroethene (TCE) and 75 percent overall reduction of chlorinated solvents immediately downgradient; a level that will ensure protection of the nearby Slocum Creek and Sandy Branch water bodies. The pilot study will also facilitate future implementation of a similar PRB in groundwater remedial efforts aboard Cherry Point.

As an added benefit, nearly 1,150 tons of soil leftover from the PRB installation was utilized in a nearby restoration project. This 'green' effort resulted in a substantial costs savings to the Navy of nearly $150,000 in soil purchase and disposal costs.

Military Munitions Response: Building upon the innovative digital geophysical mapping (DGM) effort to detect and map concentration of munitions debris and follow-up munitions-related surface debris clearance of at the former Bombing Target 2 (BT-2), MCAS Cherry Point installed 20 warning signs in the waters of Bogue Sound surrounding BT-2 to deter the public from conducting bottom-disturbing activities in the vicinity of the bombing target where detected anomalies may be associated with munitions posing a potential explosive safety hazard. The public was kept informed through fact sheets, media releases and news articles.

Range Sustainment: Proper management and maintenance of operational ranges is a priority at MCAS Cherry Point. The restoration team contributed their expertise in range sustainment with their involvement in two range clearance projects during FY2011. Through the use of vacuum recovery system, mechanized screening, and munitions removal procedures, more than 2,750 pounds of lead, 40,000 pounds of target debris, and 40,000 pounds of munitions debris was recovered.



To address dissolved chlorinated solvents in groundwater underlying a major portion of the industrial area, a 600-foot long, 35-foot deep permeable reactive barrier was constructed using more than 700 tons of zero valent iron.

The lead was recycled through the Air Station's QRP program while the munitions debris was certified as safe and properly disposed via thermal treatment.

Effective Cleanup

Innovative Remedial Approach: The UST program has successfully implemented an innovative in-situ delivery system utilizing a proprietary surfactant solution designed to remove resistant petroleum product from soils where traditional remedial methods have not been completely successful. Located within the Grant's Landing Officers Housing area, the project site contains an inactive pipeline previously used to transfer aviation gasoline and jet fuel and believed to be the primary source of contamination. The pipeline was taken out of service in 1993 and following site studies, a total fluids extraction remedy was implemented in 1998.

To remove free product, a trailer mounted mobile re-circulation system was employed to inject and extract a surfactant solution mixed with groundwater from three 'product resistant' areas within the remedial site. The first phase of the three-phase injection/re-circulation/extraction process has removed approximately 93 percent of the total free-phase product from the three areas. Two additional events are planned to completely remove any remaining contamination.

It is anticipated that the remedial system will remove nearly 100 percent of the free-phase product allowing site closure. This innovated process has been permitted by the State of North Carolina and will be used at other sites aboard Cherry Point.

Fast Track Restoration: Cargo Fuel Pit 15 is one of six aircraft refueling pits used for mission critical military cargo, troop transport, and military contracted passenger aircraft and is the source of several large fuel releases. In early 2000, a free-phase product recovery and air sparge remedial system was installed but due to continued failures of the fuel hydrant system, the remedial system was unable to remove the expanding free product plume. In FY 2012, a combination horizontal and vertical total fluids recovery well remedial system was designed and installed. Consisting of three new horizontal and five new vertical recovery wells with total fluids pumps, conversion of nine existing recovery wells with skimmer pumps into total fluids recovery wells, and installation of a dedicated oil/water separator and groundwater-to- wastewater conveyance system, the innovative remedial system recovers free product at an improved rate of approximately 300 gallons per month.

Partnerships

The restoration team with NAVFAC support has partnered with the Air Station's Qualified Recycling Program (QRP) and the Facilities Department to utilize a state-of-the-art facility to blend used oil collected by the QRP and Public Works with petroleum recovered during cleanup projects. Over 205,000 gallons of blended product was provided to the central heating plant during FY 2011 and 2012, reducing the Air Station's heating bill more than $395,000 and avoiding $92,000 in recovered petroleum disposal costs.

Blending recovered fuels from remediation sites with used oil and fuels enabled the Heating Plant to use over 206,000 gallons for energy recovery saving $395,000 in heating oil purchases.

Disadvantaged Business Participation

MCAS Cherry Point is a leader in the movement from "cost plus" to "firm fixed price" contracting. Because firm fixed price contracting is particularly suited to small and disadvantaged business entities (SDBEs), our SDBE participation is impressive. Approximately $8.0 million or 69% of Cherry Point's $11.6 million FY 2011 and 2012 cleanup execution was awarded to SBDE contracts.