Naval Air Facility El Centro

FY 2008 & FY 2009 Secretary of Defense Environmental Awards

Category: Environmental Restoration – Installation

Introduction

Naval Air Facility El Centro (NAFEC), the Pearl of the Desert, is located in the desert of southeastern California, approximately 18 kilometer north of the U.S.-Mexico border. NAFEC provides facilities, services, and materials for training fleet air squadrons. NAFEC operates one main runway, one auxiliary runway, and one area dedicated to helicopters. The 23,500 hectare (ha) facility includes a main base and two remote bombing ranges. NAFEC has an annual winter population of 1,500 and an annual summer population of 1,000. The permanent population at NAFEC includes approximately 600 officers, enlisted personnel, and civilians.

Flight squadrons conduct more than 160,000 missions (takeoffs and landings) annually at NAFEC making it the most active training facility west of the Mississippi. NAFEC's main tenant command is the Strike Fighter Wing, U.S. Pacific Fleet Maintenance, which supports squadrons from both east and west coasts. In addition, NAFEC serves as the winter home of the world-renowned U.S. Navy Blue Angels Flight Demonstration Squadron. Other U.S. service branches and military forces of U.S. allies use NAFEC as well.

NAFEC is located in Imperial County, a major farming region. In fact, through the agricultural lease program, local farmers use 445 ha of farmland on the main base. NAFEC inhabits the Colorado River Desert Region of southern California at an elevation of about 14 meters (m) below mean sea level. The weather is generally sunny and hot, with more than 350 clear days a year and summer temperatures over 100 degrees. There are three cities within 32 km of the facility: El Centro, Brawley, and Calexico. The unincorporated community of Seeley is about 1 mile south of NAFEC. The population of Imperial County is more than 140,000 and is approximately 70 percent Hispanic.

Much of the undeveloped land surrounding NAFEC abounds with native plants and animals. Mission and environmental restoration activities at NAFEC consider impacts to habitat and species as installation standard procedure. Eight California species of special concern exist in the NAFEC area:

- burrowing owl (*Athene cunicularia hypugaea*)
- flat-tailed horned lizard (*Phrynosoma mcallii*)
- osprey (*Pandion haliaetus*)
- Colorado desert fringe-toed lizard (*Uma notata*)
- prairie falcon (*Falco mexicanus*)

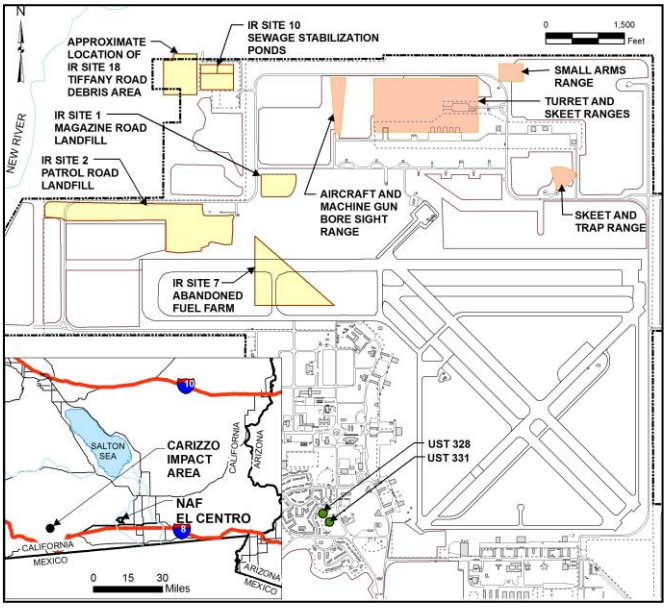


Figure 1 – Location of Active Restoration Sites

- vermilion flycatcher (*Pyrocephalus rubinus*)

- crissal thrasher (*Toxostoma dorsale*)
- LeConte's thrasher (*Toxostoma lecontei*)

Figure 2 – Construction of the full-scale remediation system was completed in FY00. More than 190 extraction and monitoring wells were installed within 500 feet of the main runway with no disruption to flight operations.

Since the early 1980s, NAFEC personnel have been actively involved in identifying, investigating, and cleaning up the facility's environmental sites. These sites include Installation Restoration (IR), Military Munitions Response (MRP) and Underground Storage Tank (UST) Program sites. In total, eighteen IR, five MRP, and 201 UST sites have been identified.

At the start of this award period, five IR, five MRP, and forty-eight UST sites required additional activity. Significant progress has been made in the last two years: closure of two IR, one MRP, and eight UST sites; closure pending California Regional Water Quality Control Board (RWQCB) concurrence for fifteen UST sites; and optimization improvements for remediation effectiveness and energy efficiency.

The Installation Restoration Program completed all activities without disrupting critical base operations or limiting training.

Background

Challenges – The greatest challenge to the IR Program is conducting environmental cleanup activities at an active airfield. Most environmental restoration sites are located within the restricted area near the main runway. Most of the remedial activities in FY08–09 were conducted during winter and spring months, the peak flying season. Restoration activities are coordinated with mission activities so as not to interfere with the training mission. If conflicts arise, remediation activities are rescheduled.

The desert environment is also a significant challenge due to hot and dusty weather. Summer daytime temperatures above 100 degrees, diurnal temperature variations, sand, and dust are a hazard to personnel and equipment. The Carrizo Impact Area site is remote, requiring four-wheel drive vehicles to access. Another challenge is limiting impacts to wildlife and natural habitats during both mission-related and environmental restoration activities. The Cleanup Team considers effects from past contamination, current base operations, and environmental activities while planning and performing site work. For instance, site work at Carrizo Impact Area was scheduled to avoid the Bighorn Sheep mating season, January through March.

In addition, the area geology complicates cleanup efforts. Interbedded and discontinuous sand and clay soil layers pose difficulty to remediation systems because contaminants are often present in discrete layers that escape the system capture zone. Groundwater levels are artificially influenced by recharge from on-base and off-base agricultural irrigation. For landfill sites, land use controls are in place to limit recharge so that the groundwater level is maintained below the waste left in place.

Other challenges include coordination with regulatory agencies while State of California employees are suffering involuntary furloughs, communication with the multilingual community, and locating historical information for sites over 20 years old.

Organization and Staffing – The NAFEC IR program is organized across agency boundaries and responsible to the NAFEC Base Commander through the Public Works Officer, LCDR Daniel A. Stokes. The Installation Environmental Office, under the direction of Ms. Kimberly Lineses, Installation Environmental Program Manager, manages local activities with Mr. Bob Fischer as Program Manager. Naval Facilities Engineering Command-Southwest (NAVFAC-SW) manages the overall restoration program with the Desert Integrated Product Team planning, programming,

and executing the program with Mr. Bill McGinnis as Remedial Project Manager. The NAFEC IR Program has fostered cooperative partnerships with the local community, regulatory agencies, and investigation/cleanup contractors, collectively referred to as the Cleanup Team.

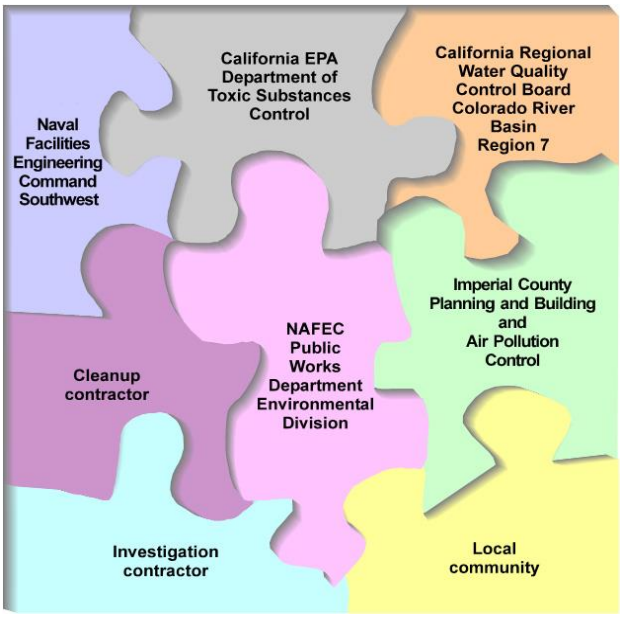


Figure 3 - The NAFEC Cleanup Team is an excellent example of proactive interdepartmental, multi-contractor, and interagency cooperation. This relationship is built on trust, cooperation, and common cleanup goals.

This spirit of cooperation is the cornerstone of the management approach. Members are:

- NAFEC Environmental
- NAFEC Facility Engineering Acquisition Division (FEAD)
- Naval Facilities Engineering Command-Southwest (NAVFAC-SW)
- Regulatory agencies, including the California Environmental Protection Agency Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board – Colorado River Basin (RWQCB) and Imperial County Planning and Building and Air Pollution Control Departments
- Contractors (including small businesses); Insight EEC, Inc.; Battelle; and Chadux/TetraTech JV.

Management Approach

The achievements of the last 2 years are directly related to NAFEC's management approach to environmental restoration. The management approach integrates military and civilian chains of command, while using a common-sense approach to environmental restoration. It involves:

- preventing disruption to mission activities
- using a realistic, phased process for site cleanup
- planning site activity to leverage funding across fiscal years to initiate and complete projects.

The Cleanup Team meets regularly to discuss current and proposed activities so that there are no "surprises" during the work. This advance planning allows NAFEC to identify future projects and effectively use all available funding. It also allows the sharing of resources among contractors. In addition, regulatory participation early in the process improves acceptance and document review times.

Community Involvement

The NAFEC restoration staff is committed to involving all stakeholders in environmental cleanup decisions. NAFEC enjoys a positive community support with a high level of trust. There is not sufficient public concern to maintain a Restoration Advisory Board. The staff maintains an open-door policy for any stakeholder to provide input. NAFEC has a Community Relations Plan and information has been presented to stakeholders through various media, including informational brochures, public notices, and meetings. Information Repositories with NAFEC Restoration documents are maintained at local public libraries in El Centro and Brawley.

The NAFEC restoration staff has developed a working relationship with the Imperial Irrigation District (IID) and local farmers. This relationship was instrumental in obtaining Right-of-Way permission to conduct site remediation activities outside the Facility fence line.

Agreements

NAFEC has no formal cleanup agreements. NAFEC is not on the National Priority List (NPL) and therefore does not have a Federal Facility Agreement (FFA) and does not have a Federal Facility State Remediation Agreement (FFSRA). The Restoration Program is pursued in accordance with Federal and State laws in cooperation with regulatory partners.

Significant Documents

The Record of Decision (ROD) for IR Site 1, Magazine Road Landfill was completed and signed by NAFEC Installation Commanding Officer, DTSC, and RWQCB. Beyond the significant milestone of signing the ROD and having full regulatory concurrence, the document is notable for 2 reasons:

1) administratively, for language crafted to successfully resolve California-wide issues with DTSC of maintaining Land Use Controls in the event of future land transfer, and

2) technically, for providing framework to perform optimized release detection by monitoring water level only.

Water samples with chemical analyses will only be taken to support the 5 year review. Water level only monitoring enables web-based monitoring using automated water level sensors with telemetry to efficiently collect continuous data rather than quarterly measurements incurring manual labor. The IR Site 1 ROD was provided to the Optimization Workgroup to be used as a good example of reducing monitoring requirements.

The Feasibility Study for IR Site 2, Patrol Road Landfill, was completed after two complete revisions due to changes in alternatives. A notable inclusion in the FS is the proposal to beneficially reuse excavated soil from the IR Site 10 remediation as a foundation layer for the proposed landfill cap.

The updated vacuum enhanced pumping system uses 50% less electricity and 26% less propane on an average hourly basis.

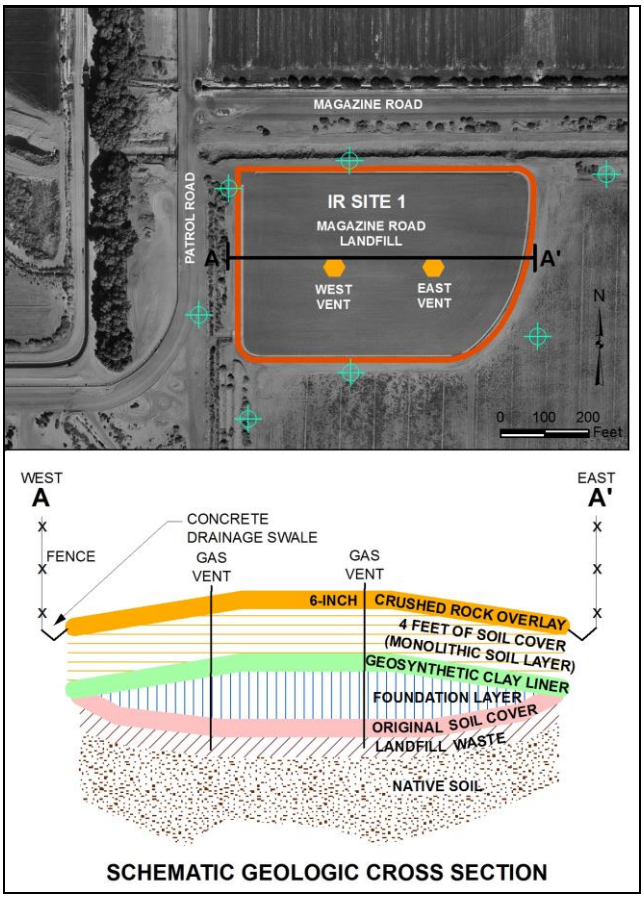


Figure 4 – IR Site 1 aerial photograph and cross section of landfill.

A draft Corrective Action Plan (CAP) for IR Site 7, former bulk fuel storage area, was completed. To facilitate completion of the CAP, a partnering meeting with RWQCB is scheduled for November 2009 to review site status, establish cleanup criteria, and develop decision criteria to transition from active remediation to monitored natural attenuation and confirm the exit strategy.

The Action Memo/Remedial Action Work Plan for IR Site 10, Waste Water Treatment Ponds, was completed and implemented during this period.

The MRP Site Investigations (SI) for Carrizo Impact Area and four Small Arms Ranges were completed well in advance of Defense Planning Goal deadlines. As a result of the SI, the Aircraft Machine Gun Bore Sight Range was designated as no-further-action since there was no evidence of release. In support of the SI for the 640 acre Carrizo Impact Area, a wide area assessment was performed using the Battelle V22 helicopter mounted magnetic gradiometer. This innovative technology performed well in flat areas but in hilly

areas was not able to be flown close enough to the ground to collect data of necessary resolution. Resulting data identified an area of high anomaly concentration and also showed that no areas were free of anomalies. As outreach and education to other Remedial Program Managers, the Carrizo Impact Area wide area assessment project was briefed at the Navy/Marine Corps Cleanup Conference in February 2009 and a fact sheet provided to the Munitions Response Program Workgroup for inclusion on the information sharing workgroup web page.

Figure 5 – A high resolution vertical gradient magnetic gradiometer was used for an airborne survey of the Carrizo Impact Munitions Response Area. This innovative technology provided the most efficient means to gather data to aid in locating subsurface UXO in rugged and inaccessible terrain.

Initiatives

Green and sustainable remediation considerations are of growing importance to the DoD and are being incorporated into the NAFEC Restoration Program. Green and sustainable remediation expands upon the current environmental practices and employs strategies for cleanups that use natural resources and energy efficiently, reduce negative impacts on the environment, minimize or eliminate pollution at its source, protect and benefit the community at large, and reduce waste to the greatest extent possible. Green and sustainable remediation uses strategies that consider all environmental effects of remedy implementation and operation and incorporates options to maximize the overall environmental benefit of cleanup actions.

In concert with this initiative, treated groundwater is reused at IR Site 7 by using a sprinkler on the well field to hydrate the surface well seals to avoid vapor short circuiting. Excavated soil from IR Site 10 is planned for beneficial reuse as a foundation layer for the IR Site 2 landfill cap. This avoids costs and emission associated with transportation, disposal costs, and consumption of valuable landfill space. Relocation of the IR Site 7 vapor enhanced recovery system from the well field south of the runway to the well field north of the runway provided the opportunity to update the system with more energy efficient components. In concert with the NAFEC Environmental Management System's target to reduce energy consumption, the updated system uses 50% less electricity and 26% less propane on an average hourly basis.

Program Summary

Objectives

With the overall goal of protecting human health and the environment by cleaning up identified sites in a timely, cost-efficient, and responsive manner, the Cleanup team has established objectives: meet the Defense Planning Goals (DPG), prevent disruption of mission activities during restoration work, and use innovative technologies for remediation effectiveness and cost savings.

Meet Defense Planning Goals. The preferred result of cleanup activities is site closure with unrestricted land use which was accomplished during this period for IR Site 10, Waste Water Treatment Ponds; MRP Site, Aircraft and Machine Gun Bore Sight Range; and eight UST sites. When clean closure is not possible, risks to human health and the environment are significantly reduced by eliminating exposure pathways. This was accomplished with a landfill cap and land use controls at IR Site 1, Magazine Road Landfill. To date, three of 18 NAFEC IR sites remain open, 25 of 201 UST sites are open, 15 UST sites are pending RWQCB concurrence for closure, and four of five MRP sites are open. For all open sites, strategies are in place and funding programmed to successfully meet the 2014 DPG. With completion of site investigation reports in 2009, the Cleanup Team has achieved the MRP DPG well in advance of the 2011 goal.

Prevent disruption of base activities during environmental work. All restoration work was carried out without disruption or incident to Mission activities and base operation. Remediation of the Site 7 contaminant plume has required activity in both the north and south well fields adjacent to the runway. The Cleanup Team has accomplished this by closely coordinating with all commands possibly affected by restoration activities. Kick-off meetings are scheduled well in advance, and site superintendents continually update affected parties. In addition, contractors coordinate safety drills with base emergency response personnel so that all workers know their roles and responsibilities during an emergency.

Use innovative technologies for remediation effectiveness and cost savings. Innovative technologies are considered when evaluating alternatives for site cleanup. As discussed in other sections, the Cleanup Team has employed a helicopter mounted magnetic gradiometer for wide area assessment, a web-based monitoring program for remediation system performance, and a liquid co-polymer soil stabilization amendment for erosion control and dust suppression. Innovative technology implementation will continue as the Site 1 ROD enables the FY2010 automated water level monitoring.

Accomplishments

The former UST 328 and 331 sites were located in the footprint of a planned MILCON construction project for a combined Child Day Care and Youth Center. The NAFEC Restoration team accelerated programmed funding to perform a fast-track cleanup project. The six month project excavated thirty-six truckloads, 898 tons, of diesel contaminated soil and resulted in clean closure/unrestricted site use with no delay of construction. Contaminated soil was transported to Western Environmental, Inc a soil recovery and recycling facility that uses thermal desorption or bio-remediation to process petroleum hydrocarbon contaminated soil. Once processed the soil is confirmed clean by laboratory sampling and then ready to be reused without risk to human health or the environment.

In addition to transforming a waste product with potential environmental risk into beneficially reusable soil, recycling avoided the need to dispose of the soil at a permitted landfill, taking up 516 cubic meters (m) of shrinking landfill space. The 8(a) certified small business Insight EEC, Inc performed the remediation work. In addition to the UST 328 and 331 sites, six other UST sites were investigated, characterized as needing no further action, and RWQCB concurred with site closure. Fifteen additional UST site closure summary packages have been submitted and are pending RWQCB review and concurrence.

In addition to the facets of activity at IR Site 7, former bulk fuel storage area, which were discussed above, active remediation activity has successfully removed free-product and reduced the footprint and maximum concentrations of the groundwater plume enabling expected transition of the treatment train to monitored natural attenuation. The 8(a) certified small business Insight EEC, Inc. is the remediation system operation contractor. Since the remediation system is in a restricted access area adjacent to the runway and the operator's office is outside the restricted area. Insight EEC, Inc has developed and is demonstrating a web-based real-time monitoring system that tracks remediation system parameters. This allows the operators to remotely monitor the system and preemptively perform maintenance rather than respond to a system shutdown.

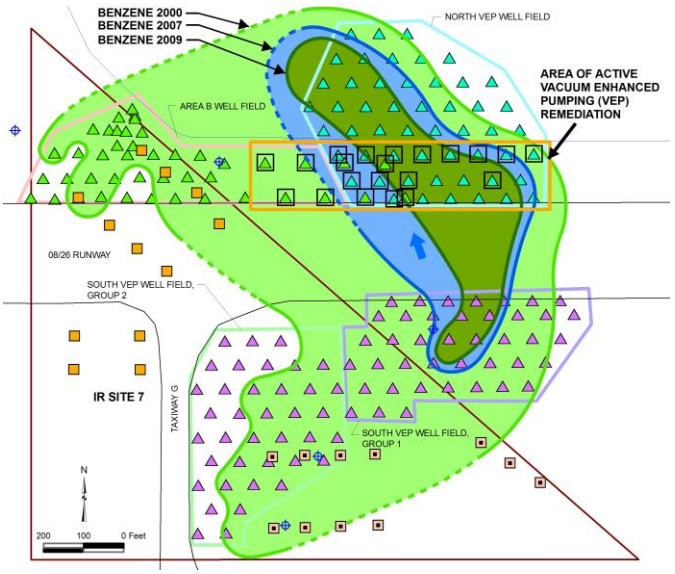


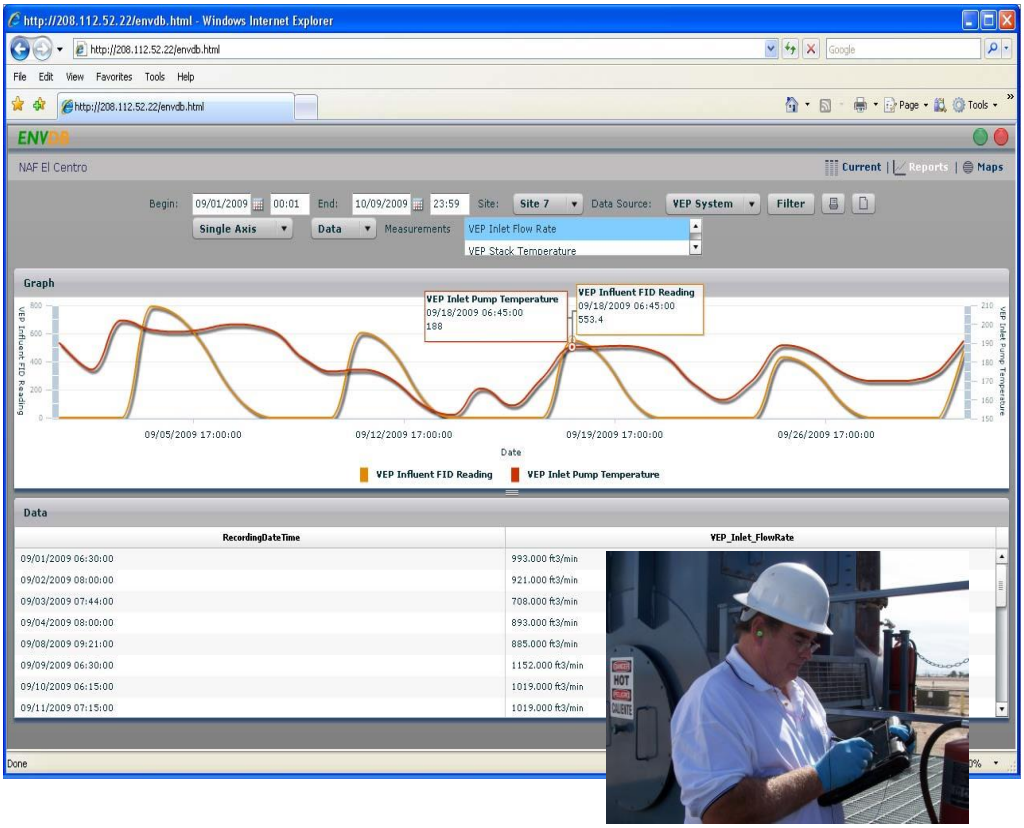
Figure 6 – Aerial Reduction in Benzene Plume from 2000 to 2009

As noted above the IR Site 10, Waste Water Treatment Ponds, Action Memo was completed and implemented. Excavation was performed to remove

3,400 cubic yards of heavy metal contaminated soil which was driving risk to ecological receptors. The removed soil was stockpiled pending beneficial reuse as foundation layer for the Site 2 landfill cap. An innovative ecologically safe stabilization amendment (a liquid copolymer) was applied to the soil stockpile for erosion control and dust suppression. Due to its high resistance to ultraviolet degradation, the liquid soil amendment was determined to be the most effective and environmentally sound alternative for stockpile dust and erosion control.

The cleanup action confirmation samples successfully met the not-to-exceed soil concentrations reducing the ecological risk to background levels. DTSC concurred with the no-further-action recommendation and site closure with unrestricted site use. In coordination with base planners, the removal action did not destroy the earthen berms surrounding the ponds. A future upgrade is planned to line the ponds and reuse as emergency holding ponds for the facility wastewater treatment plant.

Figure 7 - Performance monitoring data is uploaded daily by the field staff from a Tablet PC to the Web-Based Performance Monitoring System for stakeholder review and analysis. This process streamlines the data collection, quality control, and analysis of the data to meet weekly, monthly and quarterly reporting requirements with the regulatory agencies.



Conclusion

The NAFEC restoration team is proud of its recent accomplishments. Using a participatory management approach, partnering with regulators and stakeholders, using innovative technology and incorporating green and sustainable remediation concepts the team has made significant progress in the last two years: closure of two IR, one MRP, and eight UST sites; closure pending RWQCB concurrence for fifteen UST sites; and optimization improvements for remediation effectiveness and energy efficiency. And the progress will continue as strategies are in place to achieve response complete for all IR sites by the Defense Planning Goal of 2014. While performing these accomplishments, the Restoration Team maintains an attitude of Environmental Cleanup in Harmony with Our Mission. All restoration activities were completed without disrupting base operations or limiting the training mission.

The NAFEC restoration team has made significant progress in the last two years:

- ***Closure of two IR, one MRP, and eight UST sites;***
- ***Closure pending RWQCB concurrence for fifteen UST sites; and***
- ***Optimization improvements for remediation effectiveness and energy efficiency.***