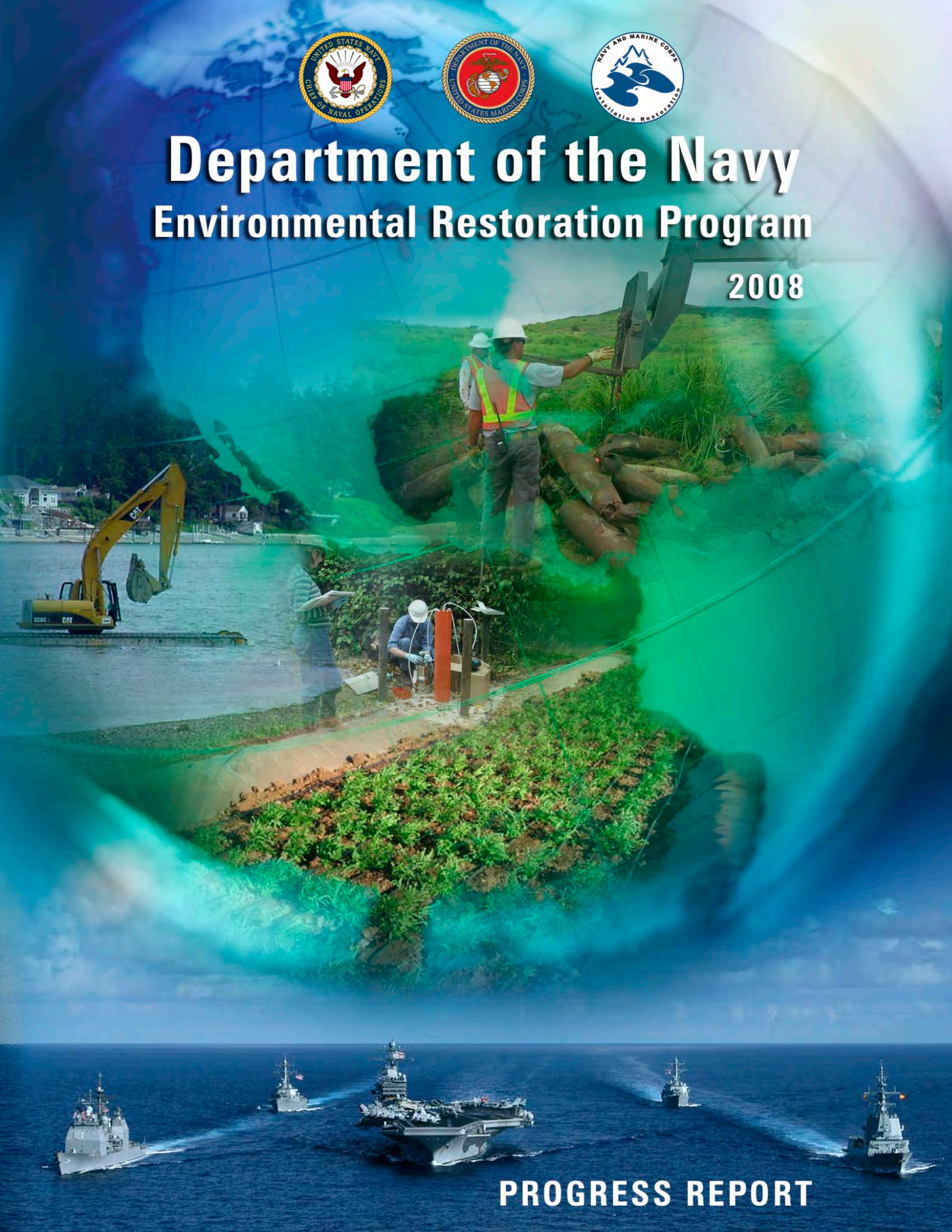
Department of the Navy
Environmental Restoration Program
2008



PROGRESS REPORT

Foreword

The Department of the Navy (DON) Environmental Restoration Program Progress Report has been a valuable resource for Restoration Advisory Boards (RABs) and their local communities, legislators, regulatory agencies and other stakeholders, and Navy and Marine Corps remedial project managers for 16 years. Compiled bi-annually, it describes progress on cleanup projects over the past year (2007) and outlines our vision for completing Installation Restoration and Munitions Response projects over the next few years. For people new to the program, the report can serve as a primer for understanding the process of cleaning up past contamination at DON installations, from preliminary site assessment through full site closeout.

The DON Environmental Restoration (ER) Program prioritizes cleanups based on each site's relative risk to human health and the environment for the Installation Restoration Program (IRP) sites, and based on the Munitions Response Site Prioritization Protocol (MRSPP) for the Munitions Response Program (MRP) sites. This supports Navy and Marine Corps training and operations by ensuring that installations with cleanup sites are compliant with environmental regulations and also makes remediated properties available for other uses to the maximum extent practicable.

Several of the success stories herein highlight the use of new and improved technologies that enable us to complete cleanups more quickly and at lower cost. Also present are exceptional examples of interagency partnering, community involvement, cost avoidance, and training opportunities for professionals in the environmental restoration field. Appendix D provides quick-reference summaries for all installations with cleanup projects.

In this era of focus on metrics, let's briefly review the numbers. At the beginning of Fiscal Year 2007, there were a total of 3,716 DON IRP sites requiring remediation. By the end of the year, 3,070 of those sites, or 83%, had remedies in place or were "response complete." As this efficient work continues, the IRP remains on track for completing all sites by 2014.

On the MRP side, we completed initial surveys to identify 239 munitions response sites this year. We also began prioritizing those sites for cleanup, completing prioritization protocols on 107 of them. To aid in the decision-making process, detailed site investigations are ongoing and are scheduled for completion by 2010.

For additional information, please visit the Naval Facilities Engineering Command (NAVFAC) Web Portal at https://portal.navfac.navy.mil/. We welcome and encourage interest in our ongoing cleanup projects.

Rear Admiral Lawrence S. Rice

Director, Environmental Readiness Division

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This report describes the DON's cleanup progress as of the end of Fiscal Year (FY) 2007 and its future plans for completing environmental restoration at active Navy and Marine Corps installations.

Environmental Restoration Program

The Department of the Navy's (DON's) mission is to maintain, train, and equip a world-class, combat-ready Naval fleet capable of winning wars, deterring aggression, and maintaining freedom of the seas. Support of this mission requires wide-ranging networks of land-based facilities and operations. As these facilities and operations functioned over the years, inevitably contaminants were released to the environment, particularly in early years before safe handling and waste management practices had evolved. Because the DON is committed to protecting both human health and the environment at its land-based facilities, it has implemented an innovative and efficient Environmental Restoration (ER) Program to clean up areas impacted by its activities. The DON is proud of the accomplishments of the ER Program and the environmental quality it maintains.

The ER Program began in the early 1980s in response to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (also known as Superfund). The program began by addressing chemical contamination, and this phase is referred to as the Installation Restoration Program (IRP). The IRP is well on its way to having remedies in place at all sites by 2014. Beginning in 2001, the Navy initiated a second phase of the ER Program to address sites having munitions and explosives-related contaminants (excluding operational ranges). This program, referred to as the Munitions Response Program (MRP), has completed initial surveys to identify sites and is performing more detailed site investigations to support decisions for cleanup.

This report presents the status of progress on the ER Program as of the end of FY 2007 and highlights many of the innovative approaches implemented to meet the complex challenges of environmental cleanup at diverse sites throughout the country. This report also discusses policies and guidance issued in 2008. The program is committed to providing state-of-the-art training to its Remedial Project Managers (RPMs), finding innovative solutions to difficult environmental problems, and optimizing the efficiency of cleanup to reduce time and avoid costs while achieving high environmental standards. The ER Program encourages cooperation with the local communities and regulatory stakeholders to ensure that solutions are acceptable to all parties.

Cover Photos *Left to right: Pearl City Fuel Annex, Pearl Harbor, HI – newly planted ferns for phytoremediation; Former Vieques Naval Training Range, PR – inert bombs are sheared; Jackson Park Housing Complex, Bremerton, WA – Marsh Buggy allows excavation in remote water areas; Naval Air Station Whidbey Island, WA – sampling groundwater.*

Left: Unexploded ordnance is prepared for detonation – Vieques Naval Training Range, Puerto Rico

Above Right: Shoreline erosion prior to remediation and marine mattresses ready for riprap replacement – Naval Support Facility Dahlgren, VA

Pathways to Cleanup

Cleanup of environmental sites requires determining whether contamination is present and, if so, where it is located; whether the contaminants cause unacceptable risk to human health or the environment; and, finally, how best to remove or treat the contaminants. To accomplish this, the DON ER Program generally follows the process developed for CERCLA response actions. This process is used at most IRP and MRP sites and provides a comprehensive approach from site identification through cleanup and closeout.

Also, the Resource Conservation and Recovery Act (RCRA) regulatory framework may be applied by regulatory agencies for corrective actions at DON sites impacted by past treatment, storage, and disposal practices for hazardous substances. State underground storage tank (UST) programs guide cleanup at most petroleum-contaminated sites.

Left to Right: Direct push rig used for pre-excavation confirmation sampling at a former fire fighting training area, excavation during the removal action, super sack for shipping off-island – Pearl Harbor Naval Complex, HI

The Environmental Restoration Process

Preliminary Assessment (PA) reviews existing information and determines the probability of and possible locations of potentially contaminated areas.

Site Inspection (SI) includes a physical inspection of potential sites and may include limited soil, surface water, and/or groundwater sampling.

Remedial Investigation (RI) fully characterizes the nature and extent of contamination at a site, determines the regulatory requirements, assesses baseline risk to human health and the environment, and develops cleanup alternatives.

> ***Early Response Action*** *is taken if significant contamination is discovered that poses an immediate threat to human health or the environment that cannot wait until the final remedy is selected.*

Feasibility Study (FS) identifies and assesses potential technologies for remediation, then develops a proposed plan. A Decision Document or Record of Decision (ROD) is written to document the remediation decisions.

Remedial Design (RD) consists of designing the selected remedial system to meet the remedial objectives described in the Decision Document or ROD.

Remedial Action (RA) is the actual cleanup work. RA *construction* covers the construction of the remedial solution to be used for cleanup. Once construction is complete and the remedy is working as designed, it is considered to be Remedy In Place (RIP). The RA *operation* covers the period of time that the remedial system must operate to achieve cleanup objectives in the ROD or Decision Document. The remedy may include Land Use Controls (LUCs), e.g., fences, signs, landfill caps, pumping and treating groundwater, zoning changes, deed restrictions, and other ways to limit site access or contain contamination.

Remedy in Place (RIP) is achieved when the construction of the remedy is complete and the remedy is operating as planned in the RD.

Response Complete (RC) is achieved once all cleanup goals specified in the ROD or Decision Document are met.

Long-Term Management (LTMgt) and monitoring may be required to ensure that the site continues to meet cleanup goals after RC.

Site Closeout (SC) is reached when the DON has completed active management and monitoring and the site can safely be returned to unrestricted use and unlimited access.

The DON ER Program follows the CERCLA response action process. This approach is used as a template for most IRP and MRP sites and provides a comprehensive cleanup approach from site identification and investigation through cleanup and closeout.

Trenching at NWIRP McGregor, TX, to install biowalls for treatment of perchlorate

Installation Restoration Program

The IRP focuses on reducing risks to human health and the environment from chemical contaminants left behind by past waste disposal operations and hazardous material spills at Navy and Marine Corps installations. Under the IRP, bases are provided with funding to locate, investigate, and clean up past waste sites and spills.

The IRP began in the early 1980s following the passage of CERCLA. The DON systematically reviewed all installations to identify potential areas of chemical contamination, and some 3,700 cleanup sites were identified. Since that time, the DON has made significant progress toward implementing cleanup actions, and the program is well on its way to completion. The DON operates in partnership with the federal, state, and local regulatory agencies and members of the community. It is the DON's goal to complete cleanup in a cost-effective manner consistent with Defense Environmental Restoration Program requirements while minimizing impacts to the military mission.

The Naval Weapons Industrial Reserve Plant (NWIRP) McGregor remediation project is an outstanding example of the Navy's environmental restoration accomplishments. NWIRP McGregor received the Navy's first Ready for Reuse determination from U.S. EPA allowing the site to be transferred to the City of McGregor for commercial and industrial development.

See McGregor Success, Page 31

COMPLETION

Munitions undergoing remote-controlled Pulsed Elemental Analysis with Neutrons (PELAN) test – Naval Support Facility Indian Head, MD

Munitions Response Program

The MRP was initiated in 2001 after Congress directed the Department of Defense (DoD) to identify and then prioritize its munitions response sites (MRSs). The MRP is designed to clean up discarded military munitions, unexploded ordnance (UXO), and their chemical residues at closed ranges and munitions disposal sites. The DON's MRP is modeled after the IRP and is implemented using the process developed for cleanup under the CERCLA legislation. However, the MRP also must address the unique explosive safety hazards associated with munitions and explosives of concern (MEC) at Navy and Marine Corps locations not designated as operational ranges.

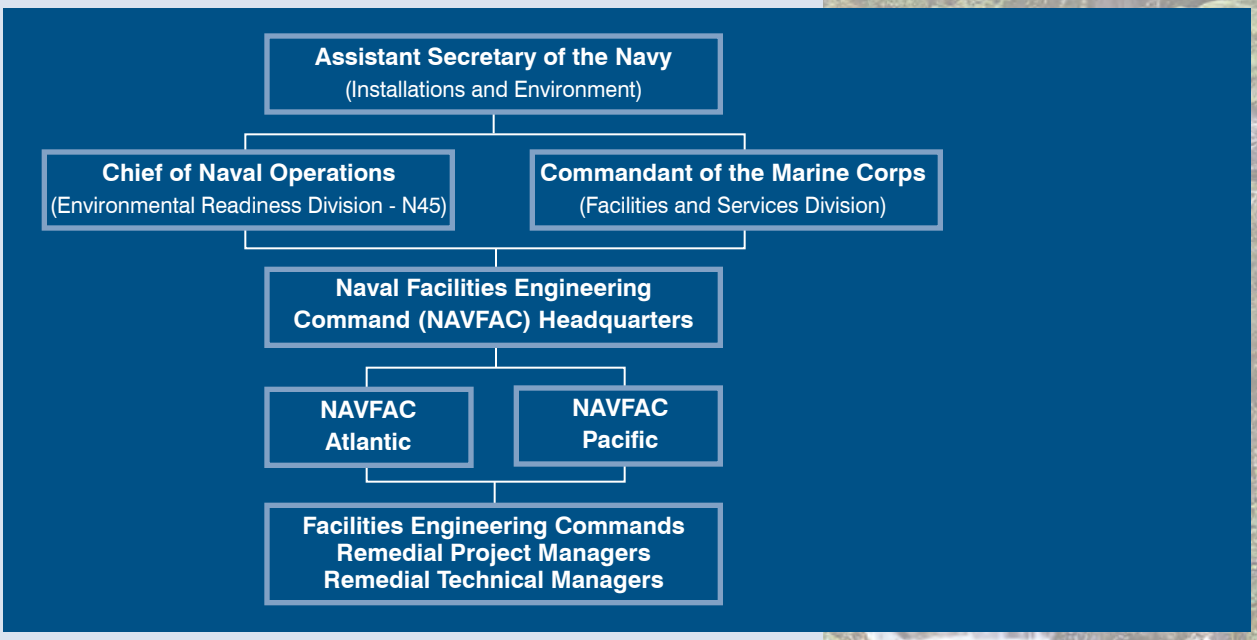
Although the MRP is considered to be part of the Navy's ER Program, its funding and cleanup status are uniquely identified. The following program goals are being used to gauge the program's progress:

- All Preliminary Assessments (PAs) must be completed by the end of 2007. Ninety-nine percent of the PAs were completed by the end of 2007.
- All Site Inspections (SIs) must be completed by 2010. Twenty-eight percent of the SIs were completed at the end of 2007. The SIs were prioritized, and 20 installation-wide SIs were commenced in FY 2007.

Use of a floating intertidal excavator or "Marsh Buggy" replaced original plans for excavation by hand or mini-excavator at Jackson Park Housing Complex intertidal area. This amphibious rig allowed safer, more efficient completion of excavations in the tidal sediments and increased access to remote intertidal areas that could be accessed only by a floating rig. Excavations were completed two weeks ahead of schedule.

See Jackson Park Success, Page 29

TECHNOLOGY



Department of the Navy Environmental Restoration Program Organization Chart

Organization and Teamwork Achieve Success

The DON's ER Program operates under the supervision of the Assistant Secretary of the Navy (Installations and Environment). Under the ASN (I&E), the primary responsibility for overseeing and implementing the ER Program is given to the Chief of Naval Operations Environmental Readiness Division (N45), the Commandant of the Marine Corps Facilities and Services Division, and the Naval Facilities Engineering Command (NAVFAC). Each of the NAVFAC Facilities Engineering Commands (FECs) are assigned to execute cleanup at the sites within their specific geographic region. The FECs report to one of the two NAVFAC commands: NAVFAC Atlantic in Norfolk, VA, or NAVFAC Pacific in Pearl Harbor, HI. Within the FECs, an RPM is assigned to manage each of the cleanup sites.

An important component that contributes to successful cleanup is the involvement of the regulators and the community. Including these groups throughout the decision-making process allows cleanup to proceed more smoothly and often prevents delays at later phases of the restoration process. The primary mechanism for ensuring the public is proactively involved in the ER Program is the establishment of Restoration Advisory Boards (RABs). RABs are made up of DON installation representatives, local citizens, regulators, and other government agencies. The members meet face-to-face to discuss the restoration project, develop plans, and review results. Navy and Marine Corps installations have formed RABs at all major installations where sufficient, sustained community interest exists.

The Naval Support Facility in Carderock, MD, sponsored a unique "hands-on" opportunity to allow the RAB and other community members to become involved in the site restoration activities, such as planting trees. This project also provided an opportunity for the facility to improve its relationship with the surrounding community and foster positive interactions.

See Carderock Success, Page 23

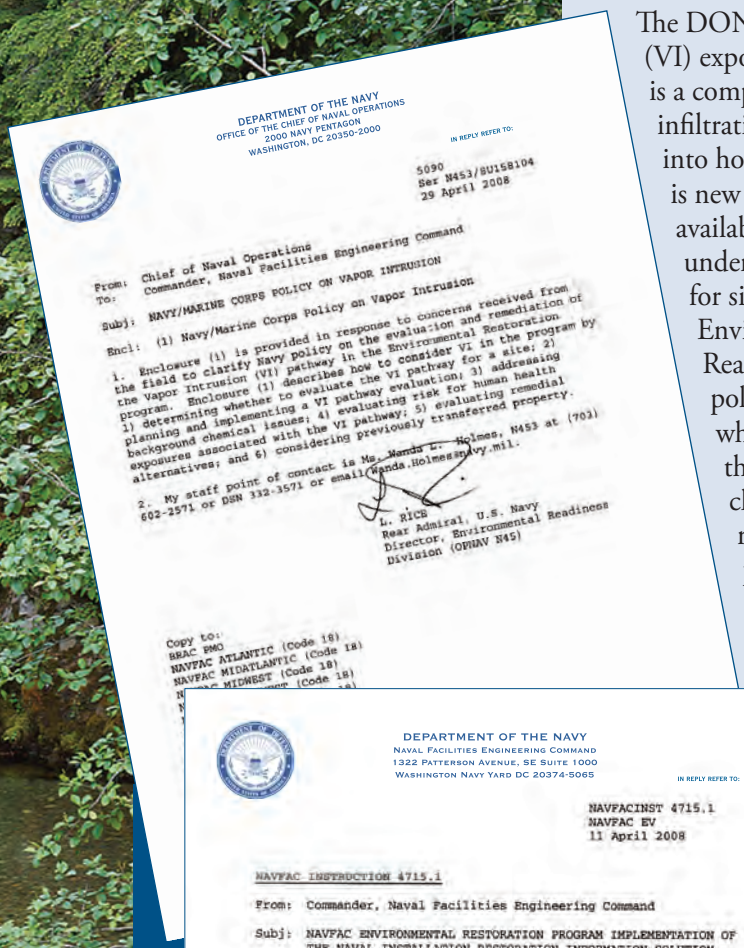
TEAMWORK

DON Policies

The DON supports the ER Program by developing policies that give direction to RPMs and others performing cleanup. These policies address various issues and topics as the need for guidance arises.

Vapor Intrusion Policy

The DON issued its policy on evaluating the vapor intrusion (VI) exposure pathway on April 29, 2008. The VI pathway is a complex exposure pathway involving assessment of the infiltration of vapors from contaminated soil and groundwater into homes, offices, or industrial buildings. This pathway is new to many RPMs and their consultants, and the available guidance is inconsistent. Therefore, the DON undertook to clarify the approach that should be taken for site investigations and response actions funded under Environmental Restoration, Navy (ER,N) and Base Realignment and Closure (BRAC) accounts. The DON policy provides guidance for Navy sites on deciding whether to evaluate the VI pathway at a site, implementing the VI pathway evaluation, addressing background chemical issues, evaluating human health risk, evaluating remedial alternatives, and handling previously transferred property if VI becomes an issue after transfer. This policy provides a consistent approach for Navy RPMs to follow as they encounter the challenges of addressing the VI pathway.



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO:

5090
Ser N453/8U158104
29 April 2008

From: Chief of Naval Operations
To: Commander, Naval Facilities Engineering Command

Subj: NAVY/MARINE CORPS POLICY ON VAPOR INTRUSION

Encl: (1) Navy/Marine Corps Policy on Vapor Intrusion

1. Enclosure (1) is provided in response to concerns received from the field to clarify Navy policy on the evaluation and remediation of the Vapor Intrusion (VI) pathway in the Environmental Restoration program. Enclosure (1) describes how to consider VI in the program by 1) determining whether to evaluate the VI pathway for a site; 2) planning and implementing a VI pathway evaluation; 3) addressing background chemical issues; 4) evaluating risk for human health exposures associated with the VI pathway; 5) evaluating remedial alternatives; and 6) considering previously transferred property.

2. My staff point of contact is Ms. Wanda L. Holmes, N453 at (703) 602-2571 or DSN 332-3571 or email Wanda.Holmes@navy.mil.

L. RICE
Rear Admiral, U.S. Navy
Director, Environmental Readiness Division (OPNAV N45)

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NAVFAC MIDATLANTIC (Code 18)
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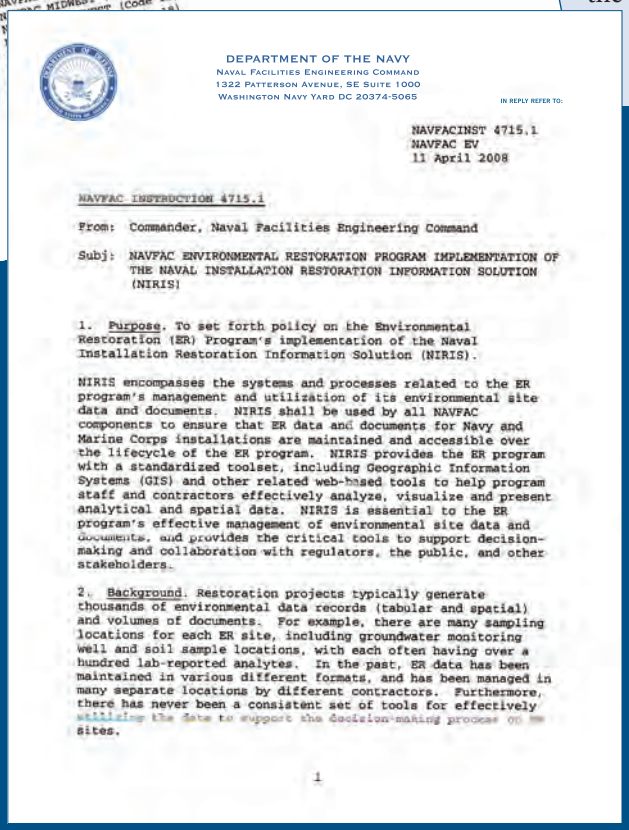


DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
1322 PATTERSON AVENUE, SE SUITE 1000
WASHINGTON NAVY YARD DC 20374-5065

IN REPLY REFER TO:

NAVFACINST 4715.1
NAVFAC EV
11 April 2008

NAVFAC INSTRUCTION 4715.1

From: Commander, Naval Facilities Engineering Command

Subj: NAVFAC ENVIRONMENTAL RESTORATION PROGRAM IMPLEMENTATION OF THE NAVAL INSTALLATION RESTORATION INFORMATION SOLUTION (NIRIS)

1. Purpose. To set forth policy on the Environmental Restoration (ER) Program's implementation of the Naval Installation Restoration Information Solution (NIRIS).

NIRIS encompasses the systems and processes related to the ER program's management and utilization of its environmental site data and documents. NIRIS shall be used by all NAVFAC components to ensure that ER data and documents for Navy and Marine Corps installations are maintained and accessible over the lifecycle of the ER program. NIRIS provides the ER program with a standardized toolset, including Geographic Information Systems (GIS) and other related web-based tools to help program staff and contractors effectively analyze, visualize and present analytical and spatial data. NIRIS is essential to the ER program's effective management of environmental site data and documents, and provides the critical tools to support decision-making and collaboration with regulators, the public, and other stakeholders.

2. Background. Restoration projects typically generate thousands of environmental data records (tabular and spatial) and volumes of documents. For example, there are many sampling locations for each ER site, including groundwater monitoring well and soil sample locations, with each often having over a hundred lab-reported analytes. In the past, ER data has been maintained in various different formats, and has been managed in many separate locations by different contractors. Furthermore, there has never been a consistent set of tools for effectively utilizing the data to support the decision-making process on the sites.

1

Policies on Vapor Intrusion and NIRIS Implementation

NIRIS Implementation Policy

NAVFAC recently deployed the Naval Installation Restoration Information Solution (NIRIS) database that will store ER Program data and documents in a central location in a common format. On April 11, 2008, DON issued its Policy on Implementation of NIRIS, which requires NAVFAC RPMs to use NIRIS to store and manage ER Program data and documents including environmental sample data, Administrative Record and other site files, spatial data for mapping, and LUC information. At a minimum, all new data must be stored in NIRIS for each ER,N site and contractors are required to submit these data in a specified format. RPMs will determine the extent of historical environmental data that will be loaded into NIRIS. Legacy systems previously developed for the NAVFAC ER Program will be shut down and the data migrated to NIRIS. The NIRIS policy will ensure that data for all sites under the ER Program are centrally archived.

Munitions Response Site Prioritization Protocol

In response to direction from Congress, DoD developed the Munitions Response Site Prioritization Protocol (MRSPP) for assigning priority to its munitions sites. This protocol was codified in the Code of Federal Regulations on October 5, 2005 (32 CFR Part 179). The protocol describes procedures to assign a relative priority to each location in DoD's inventory of defense sites known or suspected of containing MEC or munitions constituents (MC); however, these sites do not include operational ranges, operating storage or manufacturing facilities, or facilities used for treatment or disposal of military munitions.

Under the MRSPP, three hazard evaluation modules are applied to each site to determine the potential risks:

- Explosive Hazard Evaluation (EHE) Module
- Chemical Warfare Materiel Hazard Evaluation (CHE) Module
- Health Hazard Evaluation (HHE) Module.

Each module has an assigned set of factors to evaluate, and each factor has a set of data elements:

- The EHE module assesses the Explosive Hazard Factor (40%), the Accessibility Factor (40%), and the Receptor Factor (20%).
- The CHE module assesses the Chemical Warfare Materiel (CWM) Hazard Factor (40%), the Accessibility Factor (40%), and the Receptor Factor (20%).
- The HHE module assesses both acute and chronic health hazards and evaluates a Contaminant Hazard Factor, Migratory Pathway Factor, and Receptor Factor. The HHE module assesses these factors for four environmental media – groundwater, suface water, sediment, and surface soil.

View of boats trespassing at live impact area – Former Vieques Naval Training Range, Puerto Rico

Site Prioritization Protocol Structure

Explosive Hazard Evaluation (EHE) Module

Chemical Warfare Materiel Hazard Evaluation (CHE) Module

Health Hazard Evaluation (HHE) Module

Site Priority

MRSPP assigns site priority based on explosive, CWM, and toxic chemical hazards.

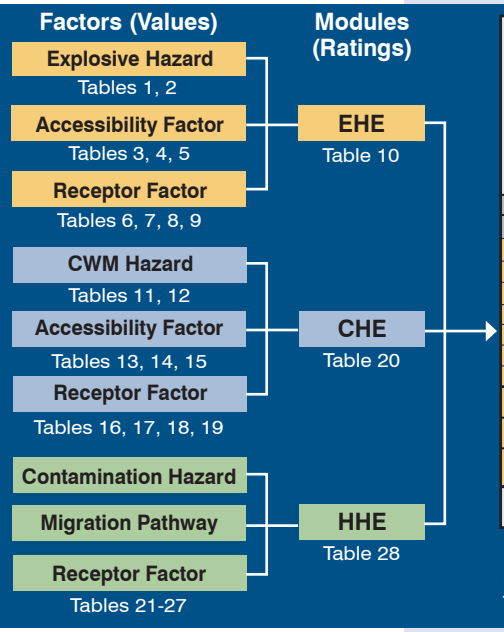


Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS** or **Alternative Priority** box at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS or ALTERNATIVE PRIORITY RATING				2	

Ratings for each module are circled and the corresponding module priority applied. The MRS Priority is determined by the single highest module priority – in this case 2.

Twenty-nine tables are used to evaluate each site and assign priorities

EHE Module (Table 10)
- **Explosive Hazard Factor**
  - Table 1. Munitions Type
  - Table 2. Source of Hazard
- **Accessibility Factor**
  - Table 3. Location of Munitions
  - Table 4. Ease of Access
  - Table 5. Status of Property
- **Receptor Factor**
  - Table 6. Population Density
  - Table 7. Population Near Hazard
  - Table 8. Types of Activities/Structures
  - Table 9. Ecological and/or Cultural Resources

CHE Module (Table 20)
- **CWM Hazard Factor**
  - Table 11. CWM Configuration
  - Table 12. Sources of CWM
- **Accessibility Factor**
  - Table 13. Location of CWM
  - Table 14. Ease of Access
  - Table 15. Status of Property
- **Receptor Factor**
  - Table 16. Population Density
  - Table 17. Population Near Hazard
  - Table 18. Types of Activities/Structures
  - Table 19. Ecological and/or Cultural Resources

HHE Module (Table 28)
- **Contaminant Hazard, Migration Pathway, Receptor Factors**
  - Table 21. Groundwater
  - Table 22. Surface Water – Human Endpoint
  - Table 23. Sediment – Human Endpoint
  - Table 24. Surface Water – Ecological Endpoint
  - Table 25. Sediment – Ecological Endpoint
  - Table 26. Surface Soil
  - Table 27. Supplemental Contaminant Hazard Factors

MRS Priority (Table 29)

Letter ratings from A to G (with A being the highest) are assigned to each module based on assessment of the factors within each module.

The resulting ratings from the three modules are combined in a final review table showing the letter rating for each module. Each letter rating corresponds to a numerical priority from 1 to 8 (with 1 being the highest); however, only the CHE can be assigned a priority of 1. The highest module priority is selected as the site priority. For example, a site that has a 3 for EHE, a 2 for CHE, and a 5 for HHE would have a site priority of 2. Also, alternative ratings and priorities can be assigned, including Evaluation Pending, No Longer Required, and No Known or Suspected Hazard.

The protocol is applied when there are enough data to run at least one of the three hazard evaluation modules. It is reapplied as necessary upon completion of a response action that could change the potential hazard or to update or validate a previous evaluation when new information becomes available.

Because application of the protocol is an important and complex task, all Navy RPMs performing these priority evaluations are required to attend an extensive training session. This training was offered several times in 2007.

RPMs are required to seek stakeholder and public involvement in applying the protocol during initial scoring and anytime the protocol is reapplied, such as when additional data become available. Also, they must provide an opportunity for stakeholder and public comment on any priority changes recommended by the Quality Assurance (QA) panel.

MRSPP, *continued*

MRSPP Quality Assurance

Quality Assurance (QA) is a critical component of ensuring that priorities are correctly assigned and that the most hazardous sites are identified. The MRSPP requires each DoD component to develop guidance for its QA process to ensure that the protocol is applied appropriately and consistently across all MRSs. The Navy's QA policy was published on August 3, 2006. In accordance with this policy, a QA Panel will review all MRS prioritizations. The QA Panel is led by CNO N45 and includes NAVFAC Headquarters and the FECs. Representatives from the Marine Corps, BRAC, and Naval Ordnance Safety and Security Activity (NOSSA) are included as necessary. To avoid conflict of interest, the panel cannot include individuals involved in applying the protocol to the site under review.

The QA Panel will review all MRS priorities. If the panel recommends a revision that changes the MRS priority, it will develop a rationale for the change and provide this to the site RPM to allow stakeholders and the public to comment before the change is finalized.

Photo: *Sunflowers in full bloom, first planting on phytoextraction site, Pearl City Fuel Annex, Pearl Harbor, HI*

Status of MRSPP Application

In FY 2007, the QA Panel completed review of all 239 sites in the MRP. This process included RPM interviews, review of PAs, archival search reports, and other documentation that can be used to support scoring. Results of this review were as follows:

- 107 sites prioritized
- 132 sites remain Evaluation Pending.

MRS Sequencing

The sequencing of an MRS for action will be based primarily on its relative priority. As a matter of DoD policy, MRSs with higher relative priorities will be addressed before MRSs with lower relative priorities. However, both DoD and Congress recognized that other factors such as community interests and value of land for development could also influence sequencing decisions. As such, the Protocol allows other factors to be considered. Once the MRS Priority is determined, other factors may be considered including, but not limited to, environmental justice, economic development, and programmatic concerns when determining the MRS's sequence for response actions. These other, or "risk-plus" factors do not change the MRS's relative priority, but may influence sequencing decisions.

The DON recognizes the importance of prioritizing munitions cleanup to address sites presenting the greatest risk before those of lower risk. A Time-Critical Removal Action was initiated at former Vieques Naval Training Range to remove surface munitions and reduce the imminent explosive safety risk to recreational boaters who periodically trespass onto the site.

See Vieques Success, Page 34

PRIORITY

Improved Record of Decision (iROD)

The DON is participating in a joint initiative between the Environmental Protection Agency (EPA) and DoD to improve implementation of the CERCLA process. One of their efforts is the development of an improved Record of Decision or iROD. The purpose of the iROD is to provide the full rationale for remedy decision in a concise document while complying with CERCLA and the National Contingency Plan (NCP) and following EPA guidance. The iROD is a traditional ROD that focuses on the use of streamlined text, figures, and tables with appropriate references to supporting documentation in the Administrative Record. It is a legal document that certifies the remedy selection process in accordance with CERCLA and the NCP. While the full rationale for the remedy selection is still presented, the iROD seeks to do so in a more concise and reader-friendly manner. For some sites this may be accomplished through the use of a hard copy document with electronic links on a self-launching, interactive, and easy-to-navigate CD.

The DON is committed to continual process improvements, and the iROD is one such improvement. Through concise use of text, a greater focus on graphic presentation, and/or the use of modern information management technology, the iROD can significantly reduce document size in a reader-friendly format. This allows for better description of the rationale used for remedy selection, shortened review times, and a remedy decision that is easily understood and scalable to all parties. The iROD initiative is intended to be consistent with the DON's Streamlined ROD Strategy issued August 31, 2007. Key elements of the strategy are to identify proactive project teams to develop iRODs and monitor their progress, to engage and obtain consensus from regulators and stakeholders throughout the process, to provide training and assistance with implementation of the iROD concept, and to continually improve the iROD concept. As part of the training and assistance, the DON is developing a Web portal that provides information on iRODs including a description, templates, example iRODs, success stories and lessons learned, and outreach resources such as presentations and brochures on iROD. This portal is available at http://www.ert2.org/t2RODPortal/.

Marine Corps Air Station (MCAS) Cherry Point was the first facility to champion the use of the new iROD format for its Operable Unit 6 (OU 6). After significant partnering efforts to develop an acceptable format, the iROD for OU 6 was signed by DoD, EPA, and the State of North Carolina in September 2006.

See Cherry Point Success, Page 25

INNOVATION

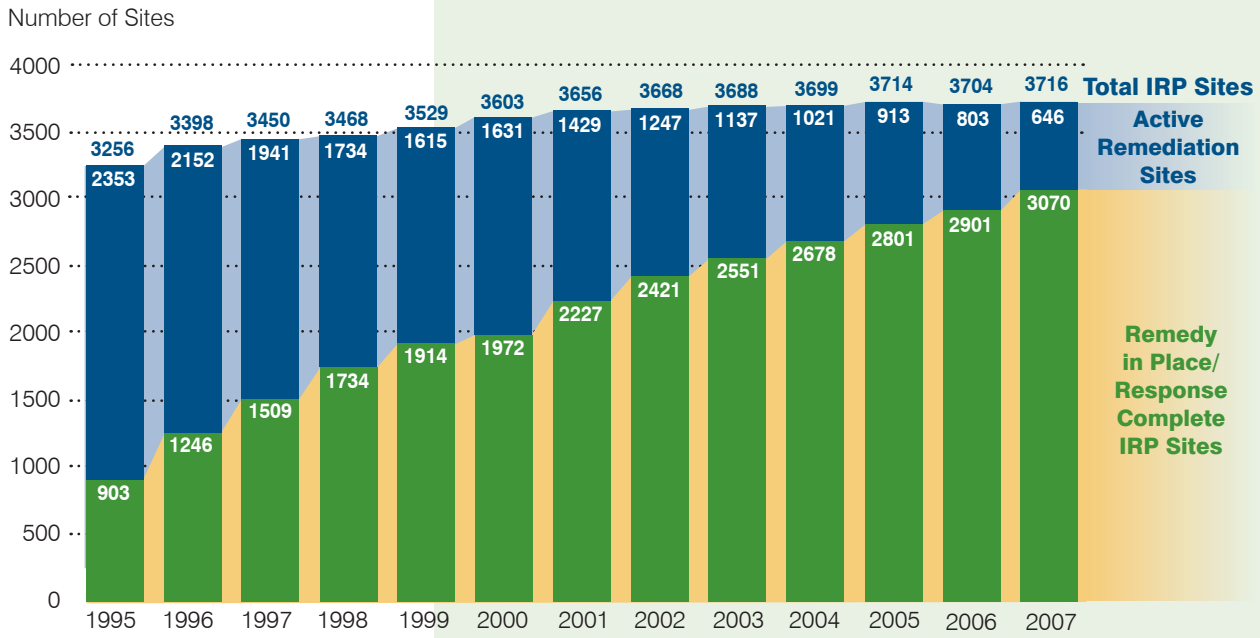
Reaching the Goal

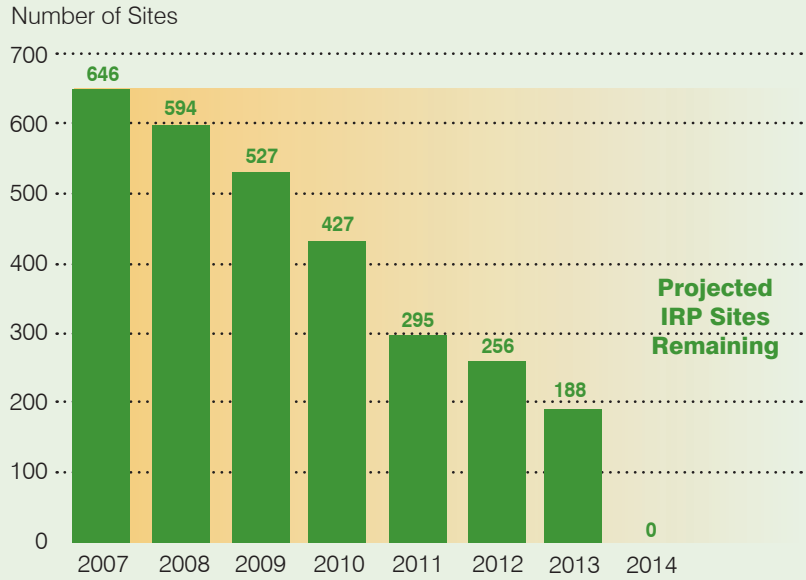
Department of the Navy's Cleanup Progress

Installation Restoration Program Status

The number of IRP sites has grown from 3,256 sites in FY 1995 to 3,716 sites in FY 2007. Since 2005, 10 sites were closed, while 12 new sites were added, resulting in a net gain of two sites to the IRP.

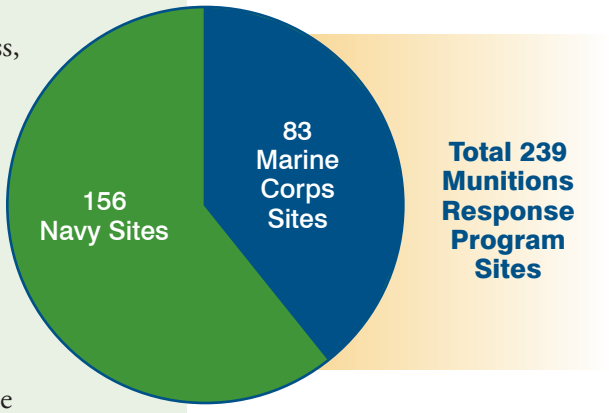
At the end of FY 2007, a total of 3,070 IRP sites (83%) are considered RIP/RC while 646 sites are yet to be completed. In FY 2007, 170 sites achieved RIP/RC status, although one site was reopened, resulting in a net of 169 sites achieving RIP/RC. Also, in FY 2007 nine installations achieved RIP/RC at all of their IRP sites. The long-term goal of the IRP is to have RIP/RC at all sites by the end of FY 2014.





Munitions Response Program Status

As development of the MRP has continued to progress, additional sites have been identified and added to the program. At the end of FY 2007, there were 239 MRP sites, an increase of 26 sites since FY 2005. Of these, the Navy has 156 sites at 56 installations and the Marine Corps has 83 sites at nine installations.

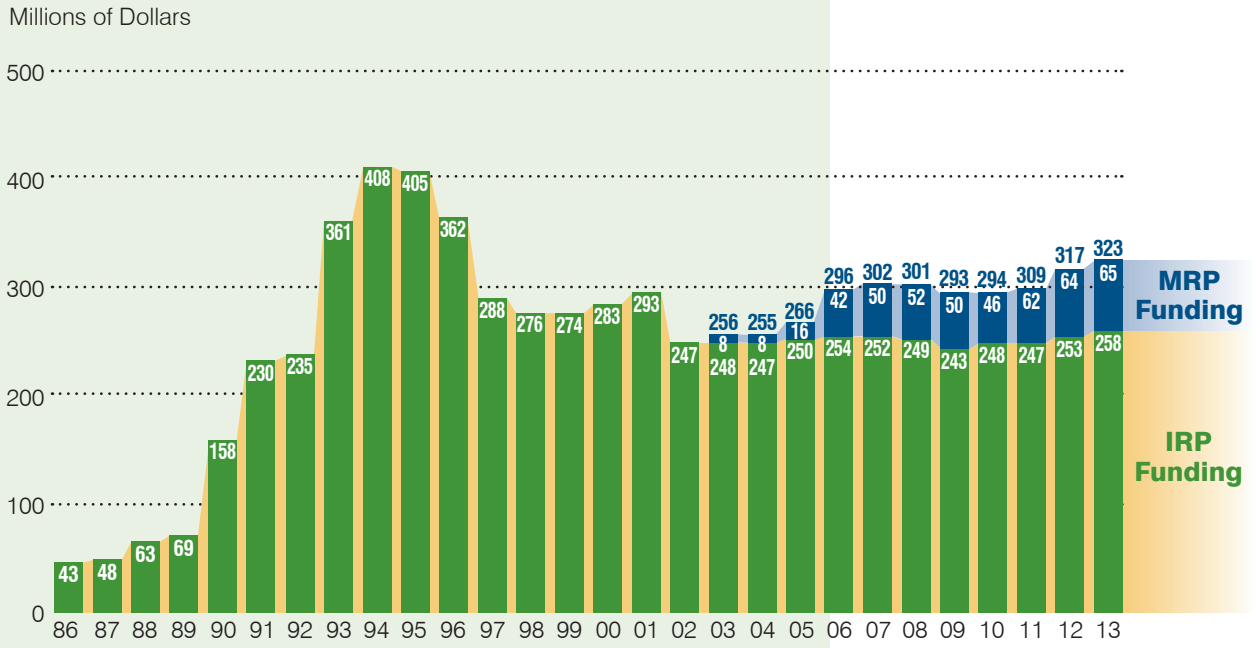


The PAs for all but one site were completed by the end of 2007, and the one remaining site is near completion. Thus, the DON goal for completing these assessments is very close to being met. The SIs were prioritized, and 20 installation-wide SIs were commenced in FY 2007. Twenty-eight percent of the SIs have been completed.

Funding History and Projections

The funding source for cleanup at all active installations is ER,N funding. Funding for the DON's IRP projects reached its peak at $408 million in FY 1994 and has dropped to a current budget of $252 million for FY 2007. The Navy's commitment to partnering with stakeholders, finding innovative ways to optimize treatment systems, instituting stable funding, and incorporating risk management into remedial decisions has been essential to reducing funding requirements.

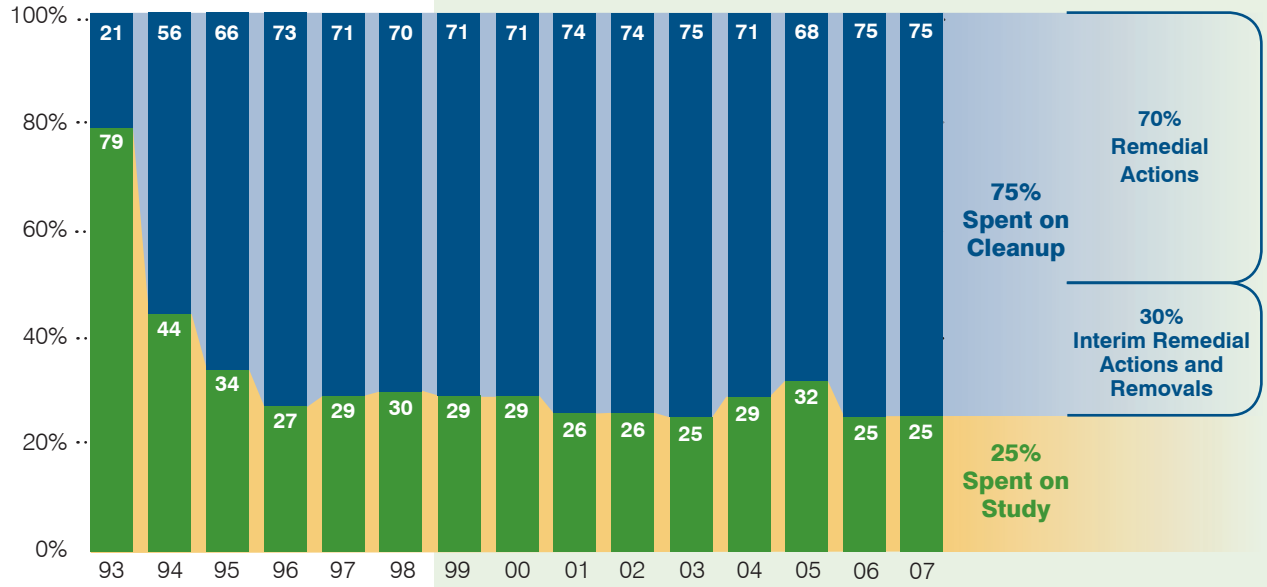
The MRP began receiving funding for site remediation in FY 2000. Funding for this program in FY 2007 is $49.3 million. Funding for FY 2008 through FY 2013 is projected to be $338.6 million.



Environmental Restoration, Navy Spending

Environmental Restoration, Navy (ER,N) funding is broken into two main cost categories: studies and cleanup. At the outset of the IRP, the DON spent most of its budget on the studies needed to locate potential sites and determine the levels of contamination. Over time, the DON has developed new sampling techniques and strategies for these studies that focus efforts on the areas of greatest concern and reduce costs. Although site characterization and pilot studies continue today, over the past 10 years the DON has placed an increasing emphasis on performing actual cleanups to reduce the risk of exposure to hazardous contaminants. Cleanups can be either full-scale Remedial Actions or smaller-scale Interim Remedial Actions or Removals.

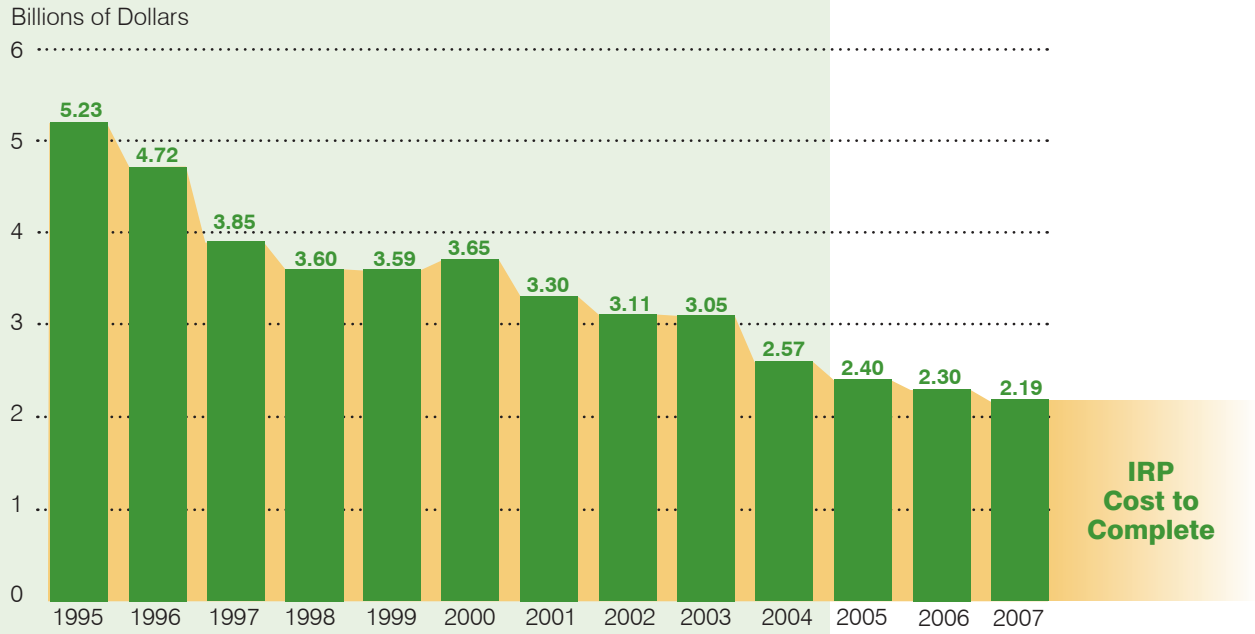
During FY 1993, only 21% of funds were devoted to cleanup; however, from 1996 to the present, approximately 70% of funds were dedicated to cleanup. Unless unforeseen circumstances demand otherwise, the DON plans to maintain this level of 70% for cleanup expenditures through the remainder of the program.



Cost to Complete and Cost Avoidance

The cost for implementing the entire IRP continues to decrease as funds are spent for cleanup and as sites achieve RIP/RC status. The FY 2007 estimated total cost to complete for the IRP is $2.19 billion.

The MRP, on the other hand, is a relatively new program that is under development. Thus, the cost to complete is still increasing as this program progresses. The MRP's FY 2007 estimated cost to complete is $0.84 billion.



In addition to the focus on bringing IRP sites to completion, the DON is continually looking for ways to improve efficiency and avoid costs through optimization of processes, thus further reducing the cost to complete. In 2004, the DON issued an optimization policy that requires the selected remedies to be continually reviewed and evaluated to assure that these remedies continue to operate efficiently. To date, the IRP has spent $6.78 million for optimization studies and cost review and $4.16 million to implement the optimization recommendations. These expenditures for study, review, and implementation have resulted in a cost avoidance estimated at $82 million, which represents a return on investment of 7.5. This cost avoidance allows these funds to be used at other sites to further reduce risk.

In 2007, Naval Air Station Whidbey Island (NASWI) upgraded its groundwater treatment system, which increased the amount of water treated and contaminants removed. It also used statistical trend analysis to support reducing sampling from 49 locations monitored quarterly to just over 20 locations monitored semi-annually or annually, avoiding $150,000/yr. Also, the Navy negotiated to terminate fuel recovery and soil treatment at three sites, avoiding $400,000/yr.

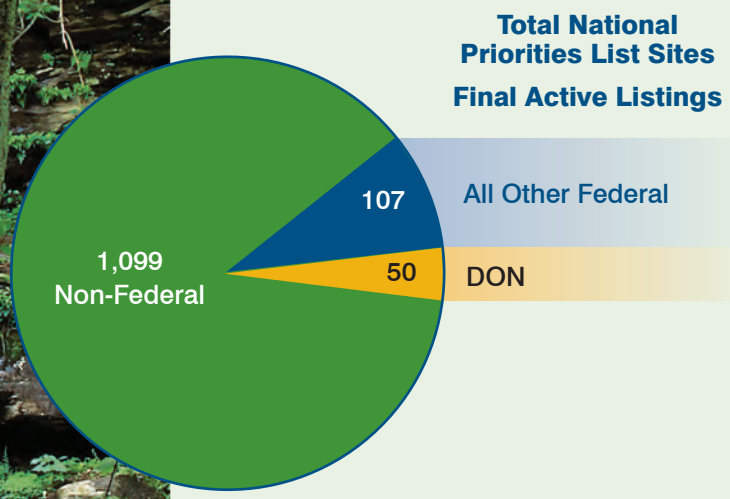
See Whidbey Island Success, Page 36

COST AVOIDANCE

National Priorities List Sites

The EPA's National Priorities List (NPL) identifies the CERCLA sites that are believed to present the greatest risk to human health and the environment on a nationwide basis, including federal and nonfederal sites. There were 1,256 final listings on the NPL and an additional 60 sites proposed for NPL listing. Of these, the DON has 50 installations listed on the NPL, all of which are final. The last Navy site to be added to the NPL was the Atlantic Fleet Training Area, Island of Vieques, Puerto Rico, which was added to the final list on February 11, 2005.

After all cleanup requirements at an NPL installation are met, the installation is eligible for delisting. Two DON installations have been delisted, and one has been partially delisted. The Naval Magazine Indian Island at Port Hadlock, WA, was delisted from the NPL on June 14, 2005; and Sabana Seca, Puerto Rico, was delisted in 1998. Naval Air Station Whidbey (Seaplane) Base, WA, was partially delisted in 1995.



DON's Environmental Restoration Training Opportunities

The DON supports its ER Program by providing numerous training and technology transfer opportunities to keep the RPMs abreast of the latest developments in the ever-changing field of environmental restoration.

CECOS

The Naval Civil Engineer Corps Officers School (CECOS) provides training classes on environmental remediation topics, including a course on Munitions Response Site Management. These courses are typically one to three days in length and are offered once or twice per year, depending on the topic. The course offerings can be accessed at:

https://www.netc.navy.mil/centers/csfe/cecos

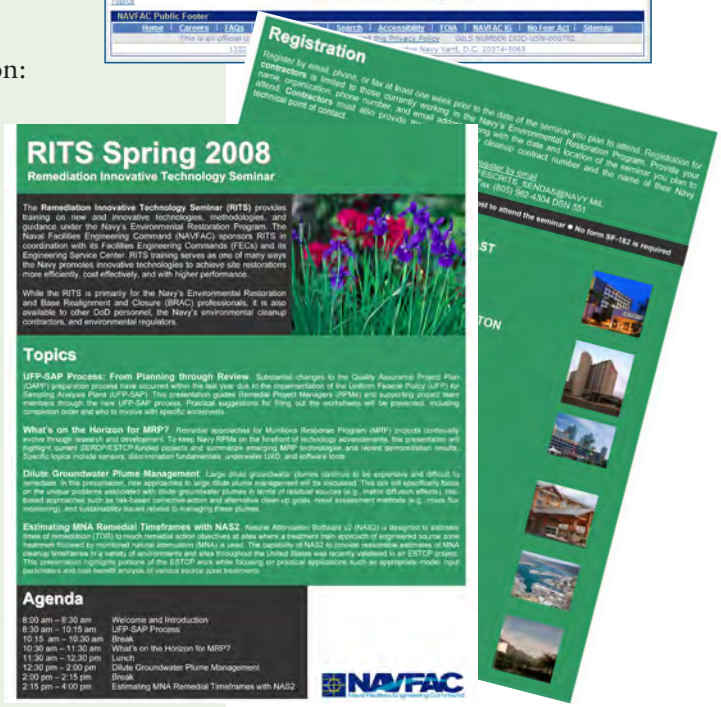
Remediation Innovative Technology Seminars

The Remediation Innovative Technology Seminars (RITS) provide training on innovative technologies and serve as one of many ways the Navy promotes innovative technologies to achieve more efficient site restoration with higher performance. The RITS are offered in spring and fall and are given at several locations across the country to provide more opportunities for RPMs to attend. Recent topics include the following:

- Characterization of Munitions Constituents
- MRP Removal Technologies
- Improved Record of Decision
- Electrical Resistive Heating (ERH)
- Sediment Remedy Effectiveness, Bioremediation: State of the Practice
- Long-Term Site Management
- Uniform Federal Policy-Sampling and Analysis Plans (UFP-SAP) Process
- What's on the Horizon for MRP
- Dilute Groundwater Plume Management
- Estimating Monitored Natural Attenuation (MNA) Remedial Timeframes with NAS2 software.

Information on current RITS programs and registration can be found on the NAVFAC Environmental Restoration and BRAC (ERB) Website:

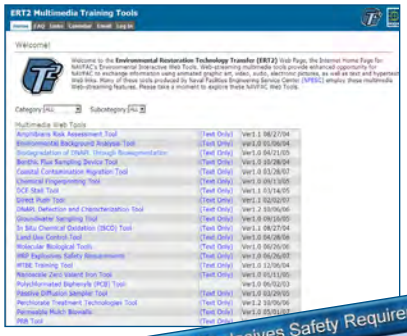
https://portal.navfac.navy.mil/go/erb

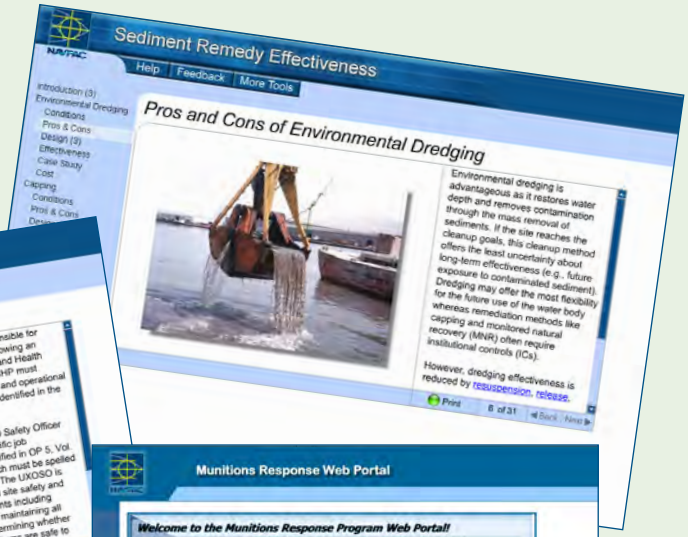


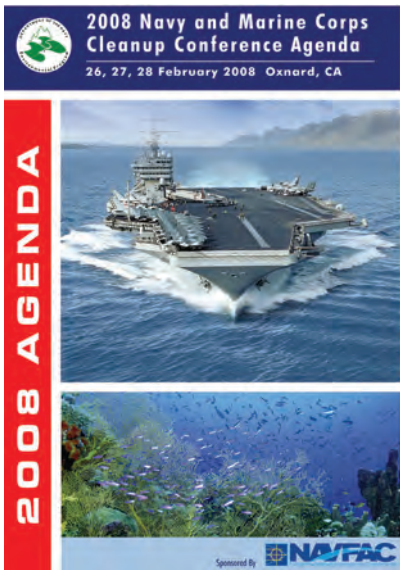
Technology Transfer Website and Training Tools

The Navy also provides a Technology Transfer (T2) website that offers a variety of self-serve training tools that can be accessed at the convenience and interest of the RPMs. The T2 tools address emerging technologies and present case studies from Navy sites where they have been implemented. One of the newest tools under development is the Munitions Response Web Portal, which will provide an overview of the MRP implementation process, case studies, and various other useful resources for RPMs, such as links to the MR workgroup and sample Statements of Work for contractors.

T2 tools can be accessed at: http://www.ert2.org







Environmental Restoration Conference

Annually, NAVFAC sponsors an ER conference where Navy RPMs come together to exchange ideas and share lessons learned from the remediation projects on which they have worked. Conference presentations provide training for project engineers on real-life cleanup situations and implementation. In addition, the conference includes several short subject-specific training sessions.

Successes in Cleanup

Environmental Restoration Program

Time-Critical Removal Action Completed at Building 284 Slope, Ford Island

Pearl Harbor Naval Complex, Oahu, HI

The Building 284 site is located on Ford Island, which is within the Pearl Harbor Naval Complex. Ford Island, located in the middle of Pearl Harbor, is host to several major tenants and commands including housing and recreational facilities for Navy personnel.

The Building 284 Slope site is an unpaved area of about 17,250 square feet at the southwest end of Ford Island. The southern and central portions of the site slope steeply toward the Pearl Harbor shoreline. Previous investigations of the site found exposed and buried concrete and metal, which appeared to be construction debris, and soils contaminated with metals.

To address the metals contamination in soil, a time-critical removal action (TCRA) was conducted from July to September 2006. Close coordination with the stakeholders enabled efficient and successful completion of this TCRA. The removal action included construction of a permeable vegetative cover and a shoreline revetment to minimize direct exposure to human and ecological receptors and prevent erosion of soil into the harbor. The permeable cover was constructed by placing a geotextile layer and a two-foot-thick soil cover layer over the contaminated soil and debris. The soil cover consisted of 18 inches of fill material overlain by a six-inch top soil, vegetative layer. The revetment was constructed with riprap armor stone placed over a geotextile layer along the shoreline. The tops of two existing groundwater monitoring wells were extended upward to ensure that they will be accessible for future use. Two additional monitoring wells were installed for use in future groundwater monitoring activities.

The TCRA was performed in coordination with the U.S. Environmental Protection Agency (EPA), State of Hawaii Department of Health (HDOH), and the community. Close coordination was required with the HDOH Clean Water Branch to address concerns about the discharge of metals-contaminated soil and sediment into Pearl Harbor during the construction activity. To ensure compliance with the Clean Water Act, best management practices were implemented during the construction activity, and a site visit by HDOH allowed the regulators to observe the best management practices directly. Because there were several historic structures at the site, the Navy consulted with the Hawaii State Historic Preservation Office prior to all field activities. In-field changes were made with follow-on consultations and resolved without extended delays in the field schedule. Open coordination and communication between the Navy, HDOH, EPA, and the Remedial Action contractor during all phases of the project allowed for efficient and successful implementation of this TCRA. The Pearl Harbor RAB was kept abreast of this and other remediation projects at Pearl Harbor.

Photos:

Top Left: Building 284 Slope site prior to removal action

Top Middle: Consolidation and preparation of subgrade for installation of cover and shoreline revetment

Top Right: Completed vegetative cover and shoreline revetment

Bottom: Aerial view of Ford Island (site is on left side of the island)

Marine Geophysical Survey Prove-Out Site Installed in Ostrich Bay

Jackson Park Housing Complex, Bremerton, WA

Ostrich Bay is adjacent to the eastern shore of the Jackson Park Housing Complex (JPHC) and Naval Hospital Bremerton (NHB) in Bremerton, WA. During initial evaluations in Ostrich Bay, the Navy recovered over 22,000 munitions and explosives of concern (MEC) from Navy-owned property adjacent to existing and former pier locations for Naval Ammunition Depot Puget Sound. The volume of MEC encountered adjacent to these pier and former pier locations made it impossible to remove all MEC items at that time. As a result, Ostrich Bay was designated as Operable Unit 3M (OU 3M) as part of the National Priorities List (NPL) CERCLA site at JPHC and NHB.

Early in the process of investigating OU 3M, the management team recognized that determining the nature and extent of the MEC contamination posing a potential risk in Ostrich Bay would require use of advanced detection systems to identify potential MEC items in surface and subsurface sediments of the bay. Because the capability of such systems to reliably detect and locate MEC was largely undocumented, the Navy launched a project funded by the Environmental Security Technology Certification Program (ESTCP) to develop a marine geophysical survey prove-out site (MGPOS) in the bay for hosting demonstrations and evaluations of detection systems to determine if available systems could meet the needs of the Navy and regulatory agencies.

One of the most challenging aspects of developing the MGPOS was placement of test items at the site and obtaining accurate location data for these items. Ultimately, the Naval Explosive Ordnance Disposal Technology Division, with the dive support of Explosive Ordnance Detachment Naval Base Kitsap Bangor (EOD Det NBK Bangor), was able to obtain reliable, repeatable location data by meticulously recording differential global positioning system locations of buoys maintained in a vertical position over items placed in the MGPOS. MGPOS installation at Ostrich Bay was successfully completed in June 2006, allowing the Navy to conduct a realistic evaluation of marine geophysical survey equipment using actual site conditions. Approximately 100 test and calibration items were successfully placed at the Ostrich Bay MGPOS. The accuracy and repeatability of the locations of the test area items were within a tolerance of one meter, which was sufficient to support demonstration and testing at the site.

In July 2006, the first demonstration of marine ordnance detection systems occurred at the MGPOS at Ostrich Bay. During the mobilization for the demonstration, one of the contractors collected data from the majority of Ostrich Bay. The results identified more than 600 metallic anomalies in the bay. EOD Det NBK Bangor recovered and identified approximately 100 of the anomalies. These data are being used to support the OU 3M Remedial Investigation/ Feasibility Study in Ostrich Bay.

Photos:

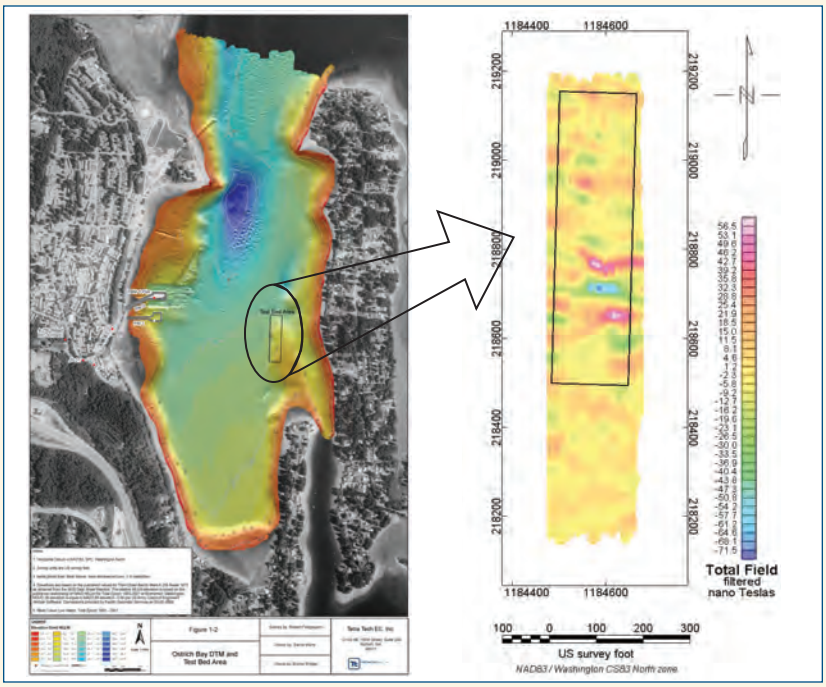
Top Left: ESTCP-funded Marine Magnetic Survey

Top Middle: Marine gradiometer being deployed

Top Right: Five-inch projectile recovered by NAVEODTECHDIV and EOD Det NBK Bangor

Bottom Left: Bathymetric Survey of Ostrich Bay showing MGPOS

Bottom Right: Pre-survey of MGPOS



Public Participation Incorporated Into Wetlands Restoration

Naval Support Facility Carderock, MD

Naval Support Facility (NSF) Carderock is located near Bethesda, MD. Site 1, the Base Landfill at NSF Carderock, was used as the base landfill from 1939 until the 1960s, receiving a variety of industrial and domestic solid wastes. As part of the ER Program, an Interim Removal Action was implemented in 2004 to remove all solid waste from the uncontrolled disposal area in accordance with Maryland Solid Waste Regulations. After excavation and removal of over 20,000 cubic yards of waste and contaminated soil, the site was re-graded rather than being backfilled. This re-grading avoided the effort and expense of purchasing and placing clean fill in the excavated area and also allowed the restoration of the site back to its original condition as a wetland. The incorporation of wetlands into this project provided an opportunity to enhance over five acres of a former landfill; moreover, because the site was located within the 100-year floodplain, the overall area available to the facility for redevelopment was not impacted as a result of the restoration.

The site restoration activities at this site provided a unique "hands-on" opportunity to involve public participation in the ER Program, allowing the RAB and other community members to become involved in restoring the site to its original condition as a wetland. These projects also allowed the facility to improve its relationship with the surrounding community and foster positive interactions. Although installing wetland plants requires specialized equipment, the Navy identified tree and shrub planting as an activity that would be ideal for community participation. During the original plans for site restoration, the RAB recommended that the Navy promote this restoration to the surrounding community and to local associations such as the Boy Scouts. A local Boy Scout Troop and a Cub Scout Pack agreed to participate, and the Navy advertised the tree and shrub planting event in the newspaper to encourage general community involvement. The Navy also invited other government members of the RAB, including the Maryland Department of the Environment (MDE), the National Park Service (NPS), the regional Navy command (Naval District Washington), and the facility employees. On April 29, 2006, the Navy hosted 40 Cub Scouts, Boy Scouts, parents, community members, and government representatives as participants in this community event.

The additional cost to incorporate the public into the site restoration activities was minimal since many of the items used for the public event were already part of the ER process. The benefits gained through this successful community event and the positive message that was conveyed to the community made this an exceptional investment. The significant participation and positive response from the community marked the planting as a successful event where the public could actively participate in the Navy's efforts to restore the environment.

Photos:

Top Left: DON communicates the Navy commitment to environmental stewardship

Top Middle: A young member of the community learns about natural preservation

Top Right: RAB members from MDE and NPS promote positive message and unified action in this remediation project

Bottom: The Navy RPM helps Boy Scouts plant a Maryland native tree

Edible Oil Injected and Subsurface pH Modified to Detoxify Chlorinated Solvents in Groundwater

Naval Weapons Station Charleston, SC

Naval Weapons Station (NWS) Charleston performs fleet, shore, and logistic support for weapons and weapons systems. In the past, an area in the southern part of NWS Charleston referred to as Solid Waste Management Unit (SWMU) 17 was used for disposal of solid and liquid wastes and missile components. Investigations at the site found that groundwater was contaminated with the solvent trichloroethylene (TCE) at concentrations exceeding 119,000 μg/L. A pilot study funded by the Environmental Security Technology Certification Program (ESTCP) was conducted at the site to evaluate the use of an emulsified edible oil to facilitate the breakdown and detoxification of the solvents. Edible oils are relatively inexpensive food-grade compounds such as soybean oil. When injected into groundwater, the oils stay in one area and slowly break down. The oil provides a source of carbon that allows bacteria in the groundwater to break down the solvents into less-toxic compounds through a process referred to as reductive dechlorination. Injection of this oil can provide sufficient carbon to continue the breakdown of solvents for several years, thus lowering operation and maintenance costs when compared with injection of other carbon sources that readily dissolve in water and require multiple injections. Edible oils can be used either in the contaminant source zone or downgradient as a barrier to prevent contaminants from moving away from the site. The SWMU 17 pilot study was designed as a barrier to prevent migration of contamination to a nearby marsh.

One hundred sixty-five gallons of edible oil emulsion concentrate, diluted at a ratio of four parts water to one part oil, was injected into the ground via permanent injection wells and distributed by pumping out groundwater and reinjecting this water into nearby well points to induce flow near the oil. The breakdown of TCE by removing a chlorine atom is referred to as dechlorination and results in an intermediate “daughter” product, 1,2-cis-dichloroethene (DCE). If the breakdown continues, additional chlorine atoms are removed to form vinyl chloride and finally ethene, which is much less toxic than the chlorinated compounds. In the pilot study, breakdown to DCE occurred in all wells in the treated zone. However, the dechlorination process stopped at DCE. This incomplete dechlorination was originally thought to result from an absence of the necessary dechlorinating bacteria at the site. However, monitoring of microbial communities and enzyme activity demonstrated that appropriate bacteria were present; but, specific enzymes necessary for complete dechlorination were not produced at the low pH. After evaluation of various buffers, magnesium oxide was used to raise the groundwater pH to between 6.5 and 7.0. The increased pH allowed dechlorination of the solvents to vinyl chloride and finally to ethene.

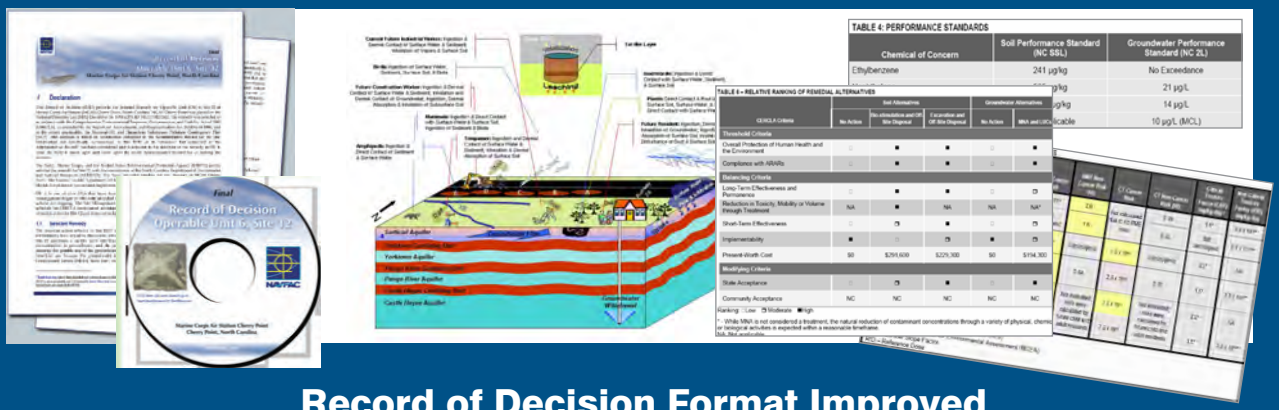
Injection of emulsified edible oil coupled with modification of the groundwater pH allowed for a more effective approach to treating extensive groundwater contamination, and the design can now be scaled up for application at alternate locations on-site. Optimization of this in situ technology avoided more costly technologies (such as pump and treat) and conventional permeable barriers consisting of zero-valent iron-filled trenches. Monitoring microbial enzyme activity provided cause-and-effect information that was used to guide buffering of the water. This pilot study demonstrated that the innovative use of soybean oil emulsion provides a long-term source of carbon and electron donor necessary for microbes to facilitate the breakdown and detoxification of solvents.

Photos:

Top Left: Injection of edible oil

Top Right: Study location

Bottom: Collection of microbiological samples with in-line filters



Record of Decision Format Improved

Marine Corps Air Station Cherry Point, NC

In the CERCLA process, the remedy selected for cleanup of a particular site is presented to the public in a Record of Decision (ROD), which contains extensive background information to support the remedy decision. In an effort to find ways to better implement the CERCLA process, the Marine Corps and Navy teamed up with the other DoD components, the EPA, the Department of Justice (DoJ), and various state regulatory agencies to develop an improved ROD (iROD) format. The interagency partnership had a goal of creating a ROD that was a concise document that provides the full rationale for remedy decision, complies with both CERCLA and the National Contingency Plan (NCP), and follows EPA guidance. Goals of the iROD are to facilitate quick access to referenced information, shorten review times, improve readability, and enhance public understanding.

Marine Corps Air Station (MCAS) Cherry Point Operable Unit (OU) 6 was the first facility to implement an iROD. OU 6 is an area of MCAS Cherry Point that was used as a runway and for crash fire training, aircraft engine checks, and long-term aircraft storage experiments. Environmental investigations indicated that some sites within OU 6 could be closed with no further action, while other sites required remedial action. The selected remedy for OU 6 consisted of removal and off-site disposal of contaminated soil, monitored natural attenuation (MNA) for groundwater remediation, and land use controls to restrict groundwater use. The ROD for OU 6 focused on summarizing the areas that were previously closed and documenting the selected remedy for the remaining area. The challenge was to develop a new ROD format that would present this information in an improved manner.

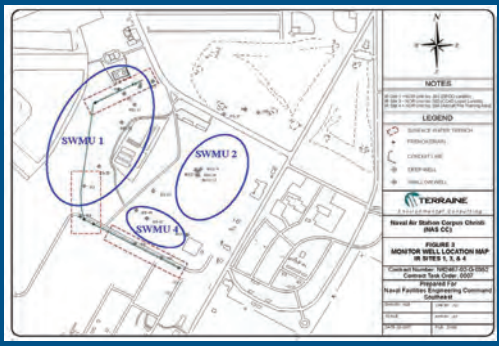
The new format consisted of a succinct hardcopy document with a reference CD-ROM, to bring technical depth to the ROD. The document incorporated visual aids to provide a better understanding of complex information such as the site-specific conceptual site model. Tables were created to present key components of the decision criteria quickly in a reader-friendly manner. The CD-ROM contained an interactive version of the ROD, allowing a user easy access to the referenced documents, enhancing the ability to search and maneuver throughout the document, and providing both options to print all or select sections of the ROD. It also provided valuable links to internet resources such as the Web site for the ER Program. The CD-ROM also allowed the document to become scalable to multiple audiences, from the casual reader interested in the fact sheet summary, to the toxicologist looking for detailed chemical information.

A major effort was made to ensure that the final product reflected a joint effort across the broader environmental community to capture improvements requested by multiple audiences to the maximum extent possible. The iROD was signed by DoD, EPA, and the State of North Carolina in September 2006. The interagency Task Force and the MCAS Cherry Point team have successfully led the iROD initiative to help expedite cleanup under the CERCLA Program.

Photos:

Top: OU 6 ROD package with new format. Summary tables and visual aids such as the site-specific conceptual site model promote better understanding

Bottom: OU 6 location map



Groundwater Remedy Optimized through Assessment and Renegotiation

Naval Air Station Corpus Christi, TX

Naval Air Station Corpus Christi (NASCC), TX, supports pilot training operations of the Naval Air Training Command and houses Corpus Christi Army Depot, which performs overhaul and repair of DoD rotary wing aircraft.

The NASCC partnering team worked to optimize remediation of groundwater by reviewing site conditions and receptors and renegotiating the required protective concentration limit (PCL).

The main Installation Restoration site at NASCC is composed of three SWMUs, including a landfill (SWMU 1), a liquid waste disposal area (SWMU 2), and an aircraft firefighter training area (SWMU 4). The site is surrounded by a man-made drainage ditch that intermittently floods and is heavily vegetated with cattails. An unconfined aquifer of fine-grained to silty/clayey sand underlies the site, and depth to groundwater is less than 10 feet with radial flow. Land use is commercial/industrial, and there is minimal risk to wildlife. Chlorobenzene is the primary indicator contaminant of concern (COC). In 1999, monitored natural attenuation (MNA) was recommended based on natural biological degradation evidence and decrease in contaminant concentrations over time. However, in 2001, an Affected Property Assessment Report (APAR) raised concerns that groundwater was reaching ecological receptors in the drainage ditch before natural attenuation had time to eliminate COCs. In response, a French drain was installed adjacent to the ditch, so that groundwater would collect in the drain rather than discharge as surface water in the ditch. The groundwater collected in the drain was processed through granular activated carbon and discharged to the NASCC sanitary treatment plant. According to the APAR, a surface water ecological chronic PCL of 64 μg/L for chlorobenzene was the appropriate groundwater indicator.

More recently, as part of the Groundwater Compliance Plan, the PCL for chlorobenzene was re-evaluated to determine adjustments based on current site conditions and the latest Texas Commission for Environmental Quality (TCEQ) guidance. After review, the Navy suggested an alternate chlorobenzene PCL because the drainage ditch is not a sustainable fishery and is not classified as a surface water feature. Also, the ditch discharges 1/2 mile from where it exits NASCC, giving chlorobenzene time to aerobically degrade before reaching the nearest classified receptor. In conjunction with the PCL review, United States Geological Survey (USGS) partnered with NAVFAC to determine whether chlorobenzene in groundwater discharges to the drainage ditch and to examine the role of cattails in depleting chlorobenzenes. Samples collected beneath the drainage ditch indicate that dissolved chlorobenzene is present in drainage ditch pore water at low concentrations (16 to 76 μg/L). Studies found that cattails are efficient in uptake of dissolved constituents and can irreversibly bind chlorobenzenes to their roots. In addition, cattails can aerate marsh soils, so there is potential for localized chlorobenzene oxidation, which would reduce the concentration.

In 2007, after evaluating the cleanup goals and site conditions, the NASCC partnering team, including representatives from NAVFAC Southeast, the EPA, TCEQ, and Tetra Tech NUS, Inc., agreed to use the acute surface water eco-risk PCL for chlorobenzenes (1,100 μg/L) in place of the chronic surface water eco-risk PCL (64 μg/L). The team referred to a TCEQ Eco-Risk Guidance recommendation that states, “Benchmarks are intended to be conservative, and generally should not be used as triggers for remediation, or as cleanup goals.” Based on current conditions, the team determined that the acute value is protective of human and ecological health.

The February 2007 groundwater sampling event indicates that chlorobenzene concentrations are below the new PCL. Assuming concentrations remain below the PCL, the team will shut down the French drain and move into MNA in 2008. This action will result in a potential cost avoidance of approximately $800,000 over 30 years.

Photos:

Top Left: USGS Chlorobenzene Study

Top Right: NASCC SWMU 1, 2, and 4 site layout

Lead-Contaminated Soil Remediated and Shoreline Stabilized

Naval Support Facility Dahlgren, VA

Naval Support Facility (NSF) Dahlgren, VA, is located along the Potomac River. The Site 37 Lead Contamination Area consists of approximately 0.6 acre adjacent to the Building 200 Machine Gun Range on the west side of a peninsula that extends into Upper Machodoc Creek. Historical records for the site indicated that sand containing lead, copper, silver, zinc, and other metals had been disposed from a nearby indoor (gun butt) range testing facility. However, the exact location of disposal operations was unknown until September 2003 when the combined winds, storm surge, and four-foot-high waves of Hurricane Isabel eroded the shoreline and uncovered the lead contamination.

Investigations concluded that risks to terrestrial and aquatic receptors were found in soil and sediment, and the Biological and Technical Assistance Group was very concerned about the potential risk presented by this site. Remedial action objectives were developed for the site; and these included protecting ecological receptors from direct exposure to gun butt sands, minimizing copper in surface soil from runoff, and minimizing erosion of soil into surface water. To accomplish these objectives, it was decided that the shoreline would be stabilized using polymeric marine mattresses (PMMs) and soil cover. This remedy reduces ecological risk, provides hurricane protection, and minimizes operational impacts during remediation.

Due to the presence of potential unexploded ordnance (UXO) along the shoreline, the remedy was restricted to very limited excavation, which included small drainage channels, minor grading, and surficial UXO clearance for construction lay-down areas. The remedy was also designed to reduce on-site construction schedules and minimize disruptions to personnel inside Building 200. The remedy consisted of a two-foot-thick soil cover, riprap shoreline stabilization, and 12-inch-thick PMMs. The PMMs, which differentiated this shoreline restoration from others, are rock-filled mattresses that are specifically manufactured for use in the corrosive marine environment. PMMs were selected because they did not require extensive toe excavation and can be placed from a distance from the shoreline. They also can be constructed off-site and, when ready, transported to the site and installed quickly, thus reducing overall schedules. The PMMs provided a toe foundation for the large riprap and were also placed along the flanks of the shoreline.

Using PMMs in lieu of large riprap at the toe of the shoreline avoided potentially high costs from unearthing munitions that could have resulted from excavating at the shoreline toe. Filling the mattresses off-site prevented remediation activities from interfering with Research, Development, Testing and Evaluation activities and worked well with the small construction footprint available at the site. Navy personnel adjusted their work schedules and worked late shifts in order to provide daylight hours to the Navy's remediation contractor. Impacts to Building 200 operation schedules were reduced, since both organizations worked at different times to avoid conflicts. All operations were performed safely and without injury to personnel, facilities, or equipment. The community was briefed during RAB meetings, and the community supported the remedy.

Photos:

Top Left: Shoreline erosion prior to remediation

Top Middle: Gun butt material deposited on the shoreline

Top Right: Crane setting PMMs in place

Bottom Upper Right: PMMs ready for riprap replacement

Bottom Lower Right: Riprap installed over two feet of clean fill. Turbidity curtain in the distance

Latest Technologies Used to Address Ordnance Issues

Naval Support Facility Indian Head, MD

The Navy recently completed a remedial/removal action on a munitions site at the Naval Support Facility Indian Head (NSF-IH), which is located approximately 25 miles southwest of Washington, DC. The scrap yard (UXO 32) contained a variety of scrap metal and ordnance items. There was also potential for materials potentially presenting an explosive hazard (MPPEH).

Throughout the 1990s, investigations at the site had identified polychlorinated biphenyls, polycyclic aromatic hydrocarbons, and metals in soil as contaminants of concern. Prior to starting remediation of these soils in 2002, the base was required to remove all scrap. In the process of removing the scrap, hundreds of unexpected munitions items were discovered, which moved the site into the MRP. The presence of munitions at the site created many problems; however, the most significant was that the large explosive safety quantity distance (ESQD) arc generated by the total net explosive weight of the munitions impacted several critical installation facilities, which could not be evacuated without severely affecting the Navy's mission. To address this problem, the remediation team requested and received an Explosive Safety Submission waiver to evaluate the items with a cutting-edge device known as the PELAN (Pulsed Elemental Analysis with Neutrons), followed by remotely operated water-jet cutting.

The PELAN device was used to determine whether the munitions contained energetic material, providing a safe and quick way to evaluate the actual explosive hazard posed by MPPEH items that could not be verified visually as inert, and was successful in effectively reducing the ESQD arcs. The high-pressure water-jet cutter was operated remotely and outside the remote operation ESQD separation distance. Once an item was cut with the water jet, UXO technicians evaluated the contents to determine whether any energetic material was present. Items determined to be non-explosive were shipped to an off-site recycling facility for smelting. Items containing energetic material and declared safe to move by UXO technicians were transported to a thermal treatment area on the base. More than 300 munitions items were successfully evaluated and demilitarized.

The Indian Head Installation Restoration Team, known as the IHIRT, successfully partnered with U.S. EPA Region 3 and State of Maryland regulators. Community relations were maintained through quarterly meetings of the RAB, whose members included representatives from the Navy, U.S. Fish and Wildlife Service (USFWS), Maryland Department of the Environment, Charles County Health Department, Charles County Planning and Growth Management, Indian Head Waste Water Treatment Plant, and community representatives.

The IHIRT had initially intended to remove all scrap from the site and perform a remedial action to address risks in soil. The discovery of munitions items undoubtedly increased the cost to remediate the site. However, the use of innovative technologies proved to be an effective cost-avoidance measure as base operations were uninterrupted for the duration of the project.

Photos:

Top Left: View of scrap yard showing piles of waste and concrete pad

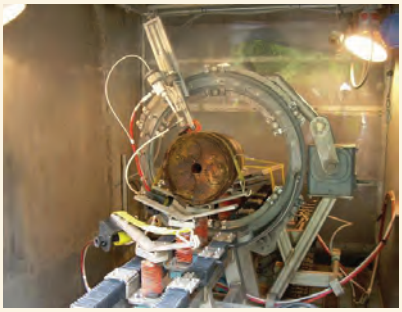
Top Middle: Munitions present at the scrap yard

Top Right: Segregated munitions awaiting PELAN testing

Bottom Left: Munitions undergoing PELAN test

Bottom Middle: High-pressure water-jet cutting action

Bottom Right: View of scrap yard near completion of project



Intertidal Discarded Military Munitions Investigated

Jackson Park Housing Complex, Bremerton, WA

The Jackson Park Housing Complex (JPHC) occupies a portion of the former Naval Ammunition Depot Puget Sound. JPHC is undergoing remedial investigation under CERCLA for discarded military munitions. The site includes a 40-acre intertidal area where approximately 20,000 metallic anomalies were identified during geophysical mapping of the site. Of these, 2,500 required investigation. The original work plan called for excavation of the anomalies by hand or by use of a mini-excavator where the intertidal sediments were firm enough to support the equipment; however, this plan was rejected by EPA based on a concern that a large number of excavations would be abandoned without obtaining necessary data due to the soft sediments filling in and making excavation unsafe. Rejection of this plan required evaluation of alternatives. The alternatives needed to cover 2,500 excavations up to four feet deep in soft saturated sediments over 40 acres of intertidal sediments during low-tide cycles in an area with up to 15 feet of tide swing.

Several excavation approaches were investigated, including using dewatering pumps in concert with coffer dams, barge-mounted excavator, or dredge; advancing custom-built sleeves with a water slurry; or using a floating excavator. Based on alternative evaluation, a floating excavator specifically designed to work in marsh- and swamp-type conditions best met the project requirements. Mobilization of the floating intertidal excavator (or "Marsh Buggy") from Louisiana to Washington was the most cost-effective alternative.

A new work plan was developed over a two-year period, working collaboratively with the stakeholders, which included members of NAVFAC Northwest, Naval Ordnance Safety and Security Activity (NOSSA), the Suquamish Tribe, U.S. EPA, and the Washington State Department of Ecology. Also, several emergency response planning meetings were held with representatives of NAVFAC Northwest, the Navy Family Housing Office, the Explosive Ordnance Disposal Unit located at Naval Base Kitsap at Bangor, and local emergency response agencies. A tabletop emergency response drill was performed to ensure that all potentially impacted organizations understood the response actions and protocol. This detailed planning and rehearsal helped validate the plan and address any weaknesses prior to the start of field activities.

NAVFAC Northwest and NOSSA performed a detailed review of explosive safety risk at the site and established clear procedures to help mitigate safety risks for the site workers, including keeping workers 200 feet away from the intertidal excavator. The 200-foot radius was established based on the hazardous fragment distance for the munitions with the greatest fragmentation distance, the 40-mm projectile. The operator was protected by the placement of two inches of lexan shielding over the front of the equipment cab.

The intertidal excavator was able to safely advance approximately 100 investigations during each day of operations. Because of the very low ground pressure design, the Marsh Buggy was able to traverse sediments that were too soft to support the weight of a person walking across the surface. Due to the Marsh Buggy's ability to float and propel itself like a boat, it was able to maneuver across the water and around a pier to reach otherwise inaccessible areas of the site. This was a key component of the Marsh Buggy's success, since it was critical to quickly access these remote intertidal areas and complete the investigation within a short tidal window.

All required intertidal excavations were successfully completed without a single explosive or human safety concern. The equipment operated effectively, without discharge of any oil or fuel to the marine environment. Production rates for this work were excellent. Through the use of this approach, the intertidal work was completed two weeks ahead of schedule. Perhaps more importantly, use of the Marsh Buggy allowed all anomaly investigations in the intertidal area to be completed. Failure to conduct these anomaly investigations potentially could have resulted in EPA not accepting the investigation as complete.

Photos:

Top: Marsh Buggy allowed access to remote areas only reachable via water while extending time for excavation between tides

Bottom: Identified and excavated anomalies

Interim Removal Action and Wetland Construction at Former Demolition Debris Landfill

Naval Amphibious Base Little Creek, VA

Naval Amphibious Base Little Creek consists of 2,215 acres in the northwestern corner of Virginia Beach, VA, adjacent to the Chesapeake Bay. The facility is primarily industrial, providing logistic facilities and support services to 27 homeported ships and more than 80 tenant commands. Site 8, the Former Demolition Debris Landfill, consisted of approximately 1.2 acres situated adjacent to and within tidal wetlands of Little Creek Cove. An observation deck for wildlife is located in the northeastern corner of the site. Two ponds were located on the eastern portion of the landfill. Primarily inert materials were disposed of at the Demolition Debris Landfill from 1971 to 1979. Thickness of waste varied from a few inches to greater than seven feet below ground surface, including waste present below the water table. An Interim Removal Action was completed in 2001 to remove surface debris in and around the landfill and wetland areas. Small amounts of visible surface debris remained on-site.

In September 2004, the project management team, consisting of the Navy, U.S. EPA, and Virginia Department of Environmental Quality (VDEQ), discussed the results of the Human Health Risk Assessment and Ecological Risk Assessment. The team concluded that no unacceptable human health risks were associated with Site 8 with the exception of landfill waste and ecological risks were low. The Navy, in partnership with the EPA and VDEQ, agreed that removal of the landfill waste and construction of a wetland would mitigate the potential human health risk and further reduce the low potential ecological risk. Reflecting the team's partnering relationship, EPA and VDEQ agreed to the Navy's proposal of a No Further Response Action Planned following the waste removal. This decision helped save time and money by eliminating the need to go beyond Step 3B of an Ecological Risk Assessment, as well as long-term monitoring and performance of a formal CERCLA five-year review.

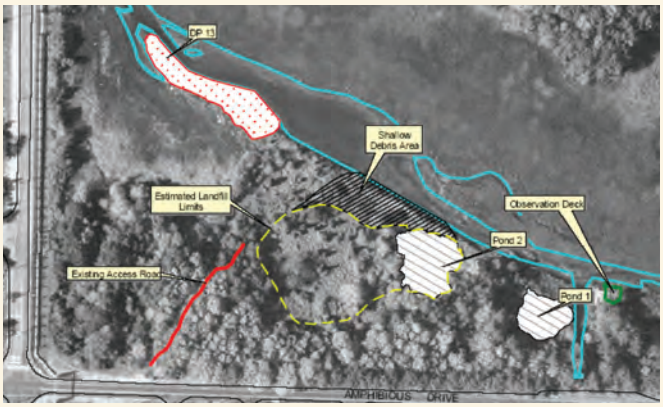
Beginning in September 2005, approximately 29,000 tons of nonhazardous soil and debris were removed from the site and 6,300 cubic yards of clean fill were imported to create the predetermined wetland elevations. Two connecting channels were constructed to allow tidal inundation into the site from Little Creek Cove. Mimicking the neighboring marsh, appropriate plants were then placed along designated elevations to establish tidal wetland vegetation. Removal of the Site 8 Demolition Debris Landfill and construction of the wetland allowed site closure with unrestricted use and unlimited exposure. This wetland was constructed in cooperation with the Navy Chesapeake Bay Program. As part of site restoration, the construction haul road was converted to a walking trail around the constructed wetlands, and two observation decks were built to provide public viewing of the area.

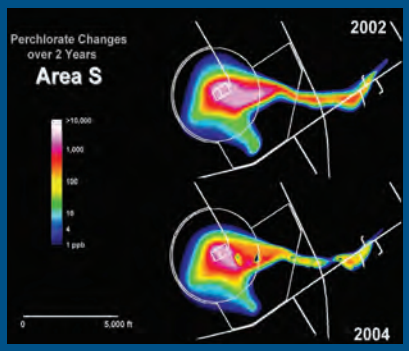
Photos:

Top Left to Right: Project progression. Site prior to, during, and after removal action and wetland creation

Bottom Left: Site map

Bottom Right: View of new planting from Picnic Platform





Cooperation Led to a Ready for Reuse Determination

Former Naval Weapons Industrial Reserve Plant McGregor, TX

"The McGregor remediation and redevelopment project is a powerful demonstration of the Navy's commitment to ensure a safe environment for future generations." Donald R. Schregardus, Deputy Assistant Secretary of the Navy (Environment)

The Naval Weapons Industrial Reserve Plant (NWIRP) McGregor remediation project is an outstanding example of the Navy's environmental restoration accomplishments. NWIRP McGregor remediation team won a prestigious Chief of Naval Operations 2006 Environmental Restoration Installation award as well as an Honorable Mention from the Secretary of Defense. The remediation team was recognized for implementing an aggressive multiphased RCRA Facility Investigation (RFI) and using innovative in situ biological treatment systems to enhance natural attenuation of perchlorate, culminating in the Navy's first Ready for Reuse determination from U.S. EPA. The team was recognized for the exceptional cooperation between the EPA, the Texas Commission on Environmental Quality (TCEQ), the Navy, and its contractors; the cultivation of a trusting relationship with the public; and a progressive regulatory strategy that allowed redevelopment of the site.

Located 20 miles southwest of Waco, TX, NWIRP McGregor was a government-owned, contractor-operated (GOCO) facility used for producing bombs and manufacturing solid-fuel rocket-propulsion systems. In the mid-1990s, the Navy began the process of transferring the property to the City of McGregor. However, in 1998, detection of perchlorate in soil and groundwater delayed the transfer. Subsequent investigations showed that perchlorate had migrated from on-site sources to off-site properties via groundwater plumes covering 2,800 acres and affecting the drinking water of 500,000 residents.

At the time the plume was discovered, no standard technologies existed to treat perchlorate other than expensive ion-exchange systems that were difficult to operate. In just two months, the Navy designed an innovative, cost-effective, and easy-to-operate treatment system consisting of two types of permeable reactive barriers (PRBs). The PRBs are filled with gravel and organic matter using the indigenous bacteria and natural groundwater flow to reduce perchlorate concentrations below detection levels. Since 2002, the Navy has strategically installed approximately three miles of trench PRBs and 1,077 boring PRBs, the world's largest application of PRBs. Two years after the Navy installed the PRBs, more than 50% of the perchlorate mass has been removed from groundwater, and off-site property is expected to be remediated within 15 years. This treatment system avoided $20 million in construction costs and more than $1 million for annual operations and reduced cleanup time by more than 10 years.

Both the Navy and the City of McGregor hoped to accomplish transfer of the 9,700 acres of the NWIRP property to the City as soon as practical. This required regulatory and community involvement. The NWIRP McGregor facility was governed by a RCRA permit that required disposition prior to property transfer. Due to financial issues, the City of McGregor could not assume ownership of the entire permit. Thus, the Navy and the TCEQ searched for alternatives to reduce the size of the permit to a manageable scale for the City. They utilized a Post Closure Order to allow the Navy to retain responsibility for environmental cleanup of the facility and subsequently reduce the area covered by the RCRA permit to 16.4 acres.

Another requirement prior to transfer included obtaining an Operating and Performing Successfully (OPS) determination from the EPA. The Navy supplied detailed reports and backup data to the EPA to confirm that all remediation systems were operating properly and successfully in reducing groundwater contamination to acceptable levels. The partnership between the EPA and the Navy facilitated NWIRP McGregor's receipt of a favorable OPS determination, the first for a facility that is not a Base Realignment and Closure facility. Subsequently, on October 6, 2006, the EPA issued a Ready for Reuse determination that allowed the property to be transferred to the City of McGregor.

The results of the remediation and partnership efforts are now being realized by the community with the creation of over 1,000 jobs. New tenants have invested over $3 million in the facility, and employment continues to increase.

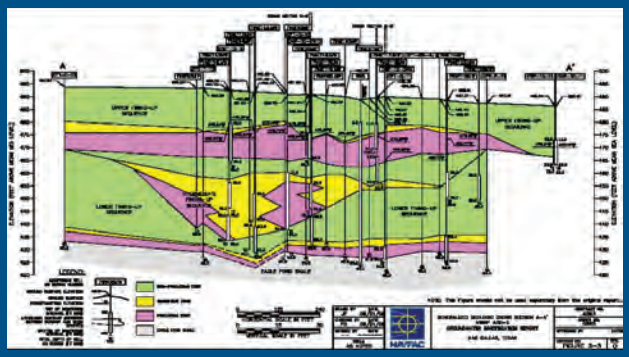
Photos:

Top Left: Fluidized bed reactor – degrades perchlorate concentrations of groundwater

Top Middle: Biowalls were backfilled with compost, wood chips, soybean oil, and limestone aggregate

Top Right: Perchlorate plume shows a two-year reduction in size after biowalls installed

Bottom: NWIRP McGregor Team at the CNO Awards Ceremony



Plume Management Zone to Manage Chlorinated Solvents

Naval Weapons Industrial Reserve Plant Dallas, TX

The Navy overcame technical obstacles and used an on-site plume management zone (PMZ) to reduce costs and accelerate soil cleanup at Naval Weapons Industrial Reserve Plant (NWIRP) Dallas. The PMZ involves use of institutional controls and long-term monitoring to protect human health and the environment at significantly lower costs than more traditional approaches.

NWIRP Dallas is a 314-acre government-owned/contractor-operated facility currently used for production of aircraft. RCRA Facility Investigation at this facility concluded that soil and groundwater were contaminated with volatile organic compounds. The Navy encountered a significant challenge in determining how to address this contamination. The site has very limited potential for natural degradation due to the carbon-poor nature of the aquifers. Technology evaluations and pilot studies conducted by the Navy failed to identify any viable technologies for remediating the groundwater contamination levels to human health protective concentration levels (PCLs). The Navy operated three pump-and-treat systems along the southern and eastern property lines for 11 years; but, despite pumping almost 200 million gallons of groundwater, less than 300 gallons of TCE were removed from the site and no reduction in the lateral extent of affected groundwater was observed.

The Navy decided that an on-site PMZ was the best remedial alternative for both soil and groundwater. In 2004, a soil Response Action Plan (RAP) incorporating the on-site PMZ was submitted to the Texas Commission on Environmental Quality (TCEQ) and EPA. Under a PMZ, soil concentrations are not required to meet soil-to-groundwater PCLs, provided that the soil leachate does not increase contaminants in groundwater. This method of institutional controls uses a deed notice or restrictive land use covenant to specify use restrictions for the affected groundwater, thus limiting human exposure. Because there is no human consumption or incidental contact, the groundwater RAP can target less-stringent cleanup objectives focusing on management of the groundwater-to-air exposures inside the PMZ and protection of groundwater resources outside the PMZ. Establishment of a PMZ requires the continued monitoring of the groundwater over the next 30 years to verify that the plume is not expanding or migrating beyond the PMZ.

The Navy established the PMZ through a robust partnership that includes the EPA, the TCEQ, the Navy, and its contractors. Continual cooperation and open communication among the partners have allowed the restoration program to proceed toward agreement. Additionally, a RAB, co-chaired by the Navy RPM and a community member, meets regularly to monitor cleanup progress, discuss significant issues, and provide input. The PMZ reduced the amount of soil requiring remediation, resulting in significant cost avoidance for the Navy and drastically reducing the impacts to operations and aircraft parts production at the NWIRP Dallas facility.

Photos:

Top Left: Aerial view of NWIRP Dallas

Top Right: Typical cross-section of NWIRP Dallas Lithology

Bottom: Site-wide TCE plume

Phytoextraction Treatability Study

Pearl City Fuel Annex, Pearl Harbor, HI

Phytoextraction is a cleanup process using plants to extract contaminants from soil. In 2005, the Navy initiated a six-month Phytoextraction Pilot Study at Site 44 of the Fleet and Industrial Supply Center Pearl Harbor, located on Pearl City Peninsula, to evaluate the feasibility of phytoextraction for remediating soil impacted with antimony, arsenic, and lead.

Historically, the site was used to receive, store, and issue bulk fuels. In 2001, the site ceased operations; all structures, tanks, and associated pipelines were cleaned and removed, with the exception of a few facilities that will remain on-site. The site is considered an area of risk due to elevated concentrations of lead, arsenic, and antimony in the surface soil and the proximity of the site to residential housing on the Pearl City Peninsula.

This pilot study had three principal objectives: to identify plant species capable of removing metals from the soil, to determine whether the metals are chemically available for plant uptake, and to obtain data to evaluate the cleanup effectiveness of phytoextraction. Four test cells were constructed, each measuring approximately 10 feet by 100 feet. The ground surface was cleared of vegetation, and liners were installed below the test cells to capture the irrigation and rain water. The bottom of the test cells were filled with gravel to provide drainage for overlying soil. Then, approximately 18 inches of impacted surface soil from the surrounding Tank Areas was placed on top of the gravel to serve as the plant root zone.

Selection of the correct plant species to survive at the site and most effectively phytoextract was a challenge. The plan was to use two plants that performed well at other phytoextraction sites, Cretan brake ferns and common sunflowers. In addition, researchers tested four types of site grasses and a selected California grass for the pilot study.

The test cells containing sunflowers and ferns showed little reduction in the metals concentrations in the soil. However, the test cell with the California grass showed a significant reduction in average arsenic, antimony, and lead concentrations. Data revealed that the decreases in soil metals concentrations occurred early in the study period with maximum observed reduction occurring within two to three months of planting. The greatest metals concentrations were found in the roots of the plants. Based on the study observations, the entire plant (including the roots) should be harvested in three-month growth cycles for best results. Projections were made to estimate the duration to achieve regulatory cleanup goals for the surface soil on-site using phytoextraction.

Although the results of the study were favorable for California grass phytoextraction, it is not known whether the observed trends of decreasing metals in soil would continue with additional grass crops. Equilibrium or bioavailability limits may be reached when concentrations of the contaminants achieve a specific level. An additional pilot study of four cycles (12 months) is needed to determine whether the technology is capable of remediating the soils to the cleanup goal and to provide a better projection on the time frame to achieve this. The findings of this study are significant and may contribute to development of a cost-effective remedial option.

Photos:

Top Left: Shade structure

Top Middle: Newly planted ferns

Top Right: Cell 4, grass after one month

Bottom Left: Site photo of phytoextraction cells 1 and 2

Bottom Upper Right: Sunflowers in full bloom, first planting

Bottom Lower Right: Harvesting sunflowers

Time-Critical Removal Action of Surface Munitions, Live Impact Area

Former Vieques Naval Training Range, PR

The former Vieques Naval Training Range (VNTR) is located on the island of Vieques, PR, approximately eight miles east of the Puerto Rican mainland. From the mid-1970s through 2003, naval gunfire and air-to-ground bombing were practiced at the former bombing range, known as the Live Impact Area (LIA). As a result of these activities, the entire 900 acres of the LIA have been impacted by munitions and explosives of concern (MEC). On April 30, 2003, the 14,600-acre VNTR was transferred to the Department of the Interior to be operated and managed as a National Wildlife Refuge. The LIA will be managed as a Wilderness Area, where public access is prohibited.

In July 2005, a Time-Critical Removal Action (TCRA) of surface munitions was initiated at the LIA to reduce the imminent explosive safety risk to recreational boaters, who periodically trespass on the site. The TCRA was initiated rapidly to reduce the explosive safety risks within the LIA by removing all MEC exposed at the ground surface. The project is currently a multimillion-dollar-per- year program with more than 130 workers on-site. To date, the TCRA has contributed over $4.0 million to the local Vieques economy.

One of the challenges of the TCRA was addressing the risk and liability of off-site transportation of munitions demolition debris that may potentially contain explosives residue. To address this issue, a Central Processing Center was set up to process the munitions debris and range-related debris that remain following in-place detonations of munitions. The processed debris is certified as free of explosives, ensuring that this material is safe to handle. This approach avoids the potential liability of transporting explosive materials off-site, as well as enhancing the value of the scrap in the recycle market. Proceeds from this recycling are re-allocated to the TCRA. More than $22,000 of recycling revenue has been re-allocated toward the cleanup so far.

Another challenge to this effort was the lack of a skilled munitions removal labor force in Puerto Rico. To address this challenge, the Navy provided unexploded ordnance (UXO) Technician I training classes and 40-hour Occupational Safety and Health Administration UXO awareness training classes to the local residents. These trained personnel were hired by the munitions removal contractors and assist in the cleanup by removing vegetation, collecting munitions-related debris, and assisting in demolition activities. Using these local workers reduces the mobilization and per-diem costs for personnel from the continental United States. Eighty-one local residents of Vieques have been trained and are employed in the cleanup of the munitions from the LIA, which has resulted in a cost avoidance of $2.1 million per year. The workers also promote the success of the program by providing positive feedback in the local community.

Since July 2005, more than 10,310 MEC items, including 2,975 bombs, have been detonated, demilitarized, and removed from the LIA. To date, 513 acres of the LIA have been surface cleared of munitions to minimize safety risk to the public and to allow U.S. Fish and Wildlife Service to initiate the management of the natural resources within the LIA. More than 5,990 tons of munitions-related scrap metal have been processed on-site to be free of explosives and then shipped off-site for recycling. The TCRA is anticipated to be completed in FY 2009.

Photos:

Top Left: UXO is prepared for detonation

Top Middle: Inert bombs are sheared at Central Processing Center

Top Right: UXO is detonated on-site prior to transport to the Central Processing Center

Bottom: Local Vieques residents have been trained and hired to assist in the cleanup of munitions

Agreement on Work Plans for Munitions Investigation of Jackson Park Housing Complex

Bremerton, WA (Former Naval Ammunition Depot Puget Sound)

The Jackson Park Housing Complex (JPHC) was formerly part of Naval Ammunition Depot (NAD) Puget Sound. As a result of past munitions storage, handling, transportation, and disposal activities conducted at NAD Puget Sound, various areas of JPHC are suspected of being contaminated with discarded military munitions (DMM). In 2004, the Navy and EPA entered into an interagency agreement to conduct investigation and cleanup of former NAD Puget Sound under the CERCLA framework.

Due largely to the lack of guidance or precedence for dealing with explosive safety hazards in a CERCLA framework, significant obstacles to agreeing on the investigation approach to determine the nature and extent of DMM soon developed. Because regulatory guidance under CERCLA was developed with the intent to assess threats to human health and the environment from chemical contaminants (as opposed to explosive hazards associated with DMM), guidance for development of the investigative approach to be used for JPHC was lacking.

The Navy believed that extensive existing data supported a conclusion that the site posed a relatively low degree of explosive safety hazard and, therefore, proposed excavation of a reduced number of anomaly locations at the site compared with the level of investigation advocated by EPA. Over the course of two years, the Navy and EPA were unable to come to an agreement on the remedial investigation (RI) work plans and this lack of agreement led to a formal dispute between the Navy and EPA.

Ultimately, in April 2007, EPA and NAVFAC Northwest agreed and a final version of the Phase 2 RI work plan for OU 3 Terrestrial (OU 3T) at JPHC was approved. Field activities for the RI began in May 2007.

During dispute resolution, one of the primary concerns expressed by the Navy was the need for clearly defined decision-making criteria, or decision rules, to allow the project team to identify areas of the site that did not require further investigation or cleanup. Because of the Navy's insistence on including such decision rules in the approved Phase 2 OU 3T JPHC RI work plans, it has been possible for the Navy to eliminate much of the site from consideration for cleanup based on results of the field investigation work conducted to date. As of September 2007:

- Over 6,400 anomaly locations investigated (67% complete).
- Only two DMM items containing high explosives encountered to date.
- 178 of the 183 grids investigated (97%) are expected to require no further removal or remedial actions beyond maintaining existing land use controls, based on finding no DMM items during the intrusive investigation field work.

Successfully identifying those areas of the site that will not require cleanup actions removes much of the uncertainty concerning cleanup costs for the site. Prior to execution of the Phase 2 RI, this uncertainty contributed to a cost-to-complete estimate for remediation of the site of approximately $20 million. By eliminating substantial areas of the site from possible cleanup requirements, the cost-to-complete budget for the site will be significantly reduced.

Photos:
Top Left: Anomalies marked for excavation
Top Right: Density of excavated anomalies
Bottom: Excavating anomalies

Long-Term Monitoring and Operation and Maintenance

Naval Air Station Whidbey Island, WA

The Naval Air Station Whidbey Island (NASWI) is an active installation located on Whidbey Island at the northern end of Puget Sound. The NASWI was listed on the NPL in 1990 after which numerous remedial investigations (RIs) were conducted. Following an RI on the active Area 6 landfill, the landfill was closed and capped; and a groundwater extraction, treatment, and recharge (GETR) system was constructed. The GETR system has been in continuous operation since 1995, treating approximately 240,000 gallons of water each day. The system has nine recharge wells that pump chlorinated solvent-contaminated water to a central treatment plant, where the water is stripped of contaminants using air stripper technology, and then is discharged back to the ground to maintain the aquifer. Because the water pumped from the ground at this site contains high iron and other inorganic components, scaling and biofouling create a continual need for maintenance.

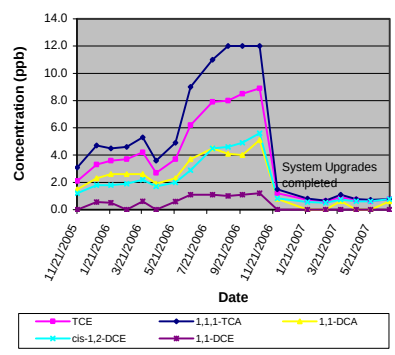
During 2006 and 2007, the Navy completed a thorough review of the equipment needing replacement and implemented system upgrades that will ensure the plant remains state of the art well into the next decade, including:

- Upgrade of operating system software to a state-of-the-art system.
- Replacement of over 500 cubic feet of stripper media and rejuvenation of the treatment plant conveyance pumps and piping.
- Cleanout and removal of several tons of sludge from the 40,000-gallon equalization tank.
- Chemical treatment and/or mechanical cleaning of each extraction well pump, combined with chemical well-screen cleaning, which improved extraction rates by 25%.
- Mechanical cleaning of the plant discharge line, which increased plant discharge from a degraded 137 gallons per minute (GPM) to over 200 GPM.

Results of these aggressive operation and maintenance (O&M) activities significantly increased the total volume of water treated on a daily basis as well as significantly reduced contaminant levels in the treated water discharged from the plant. During the first quarter of 2007, the plant effectively removed over 28 pounds of trichloroethene (TCE) and 1,1,1-trichloroethane (TCA).

In addition to system upgrades, the Navy integrated cost avoidance measures at all of the active treatment sites located at NASWI. Significant cost avoidance resulted at Area 6 through the use of a statistical trend analysis at all sampling locations. The sampling requirements were reduced from 49 locations monitored quarterly to just over 20 locations monitored either semiannually or annually. These reductions were approved by EPA and will result in a cost avoidance of $150,000 annually. Also, the Navy negotiated for cessation of fuel recovery and/or soil treatment at three sites. Suspension of treatment, with EPA approval, and reliance on natural attenuation to achieve “No Further Action” will result in a $400,000 annual cost avoidance. By maintaining an effective review program that continually seeks to reduce both monitoring and O&M costs through the use of innovative, cost-saving measures, the Navy has been able to reduce costs while ensuring the environmental objectives for the site are met.

Through the implementation of aggressive actions, the Navy has achieved an outstanding record of environmental restoration stewardship at NASWI. This stewardship resulted in a significant reduction in monitoring and treatment/recovery efforts. The Area 6 treatment plant underwent major improvements, which resulted in more efficient plant operations, higher volumes of water treated, and reduced contaminants in the plant discharge. Further, the Navy involved both the community and regulators in the upfront planning during all Installation Restoration activities, ensuring an outstanding relationship with the City of Oak Harbor, adjacent homeowners, and other state and federal agencies.



Photos:

Top Left: Sampling activities at Area 6

Top Middle: Contaminated media in air stripper before replacement

Top Right: Biofouling of discharge pipe

Bottom: Graph showing upgrades effectively reduced contaminant levels

Environmental Restoration in the Future

The mission of the Department of the Navy (DON) is to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom. A critical aspect of ensuring the long-term sustainability of installations and ranges is to demonstrate that the DON is conscientiously managing resources in an environmentally sound manner. Correspondingly, knowledge and awareness of operational requirements to support the mission of the DON while carrying out the Environmental Restoration (ER) Program's Installation Restoration Program (IRP) and Munitions Response Program (MRP) are paramount. The DON will continue progressing toward the goal of a clean, healthy environment that supports the fleet mission.

The DON provides continual improvements to the IRP and MRP, fostering innovative investigation and cleanup decisions through technical workgroups, educational opportunities, and annual conferences that bring restoration staff together to share lessons learned. In addition, the DON wants to inspire stakeholders' confidence in the Navy's IRP and MRP through open communication while promoting understanding of total DON readiness issues. It is people and partnerships that make efficient and effective environmental restoration possible. Through the ER Program, the DON will continue program implementation to achieve Remedy in Place or Response Complete at all IRP sites by the end of 2014 and MRP sites by the end of 2020.

Appendices

Appendix A – Installation Restoration Program (IRP) Status

This appendix presents IRP phase data by state and under each state, by installation.

Appendix B – Munitions Response Program (MRP) Status

This appendix presents MRP phase data by state and under each state, by installation.

Appendix C – Environmental Restoration Totals

This appendix presents a summary of the total number of sites in various phases of environmental restoration under the IRP and MRP.

Appendix D – Installation Summaries

This appendix presents details of the cleanup plans by individual installation for the Navy and Marine Corps bases organized by state. It includes both IRP and MRP sites.

Appendix E – Installations with Assessment Complete and No Sites Identified

This appendix lists the Navy and Marine Corps installations for which a Preliminary Assessment (or an Initial Assessment Study) was completed and no sites were identified that required further study or cleanup.

Appendix F – Installations with All Completed Actions at All IRP Sites

This appendix provides a list of all installations where cleanup (RIP/RC achieved) of IRP sites is 100% complete.

Appendices are organized alphabetically by state and under each state alphabetically by installation.

Acronym List for Appendices

These are the primary acronyms used in Appendices A, B, and C.

C	Completed, number of sites with the phase completed
C (ACT)	Completed, number of sites with IRAs completed (number of interim actions completed at the sites)
CA	RCRA Corrective Action program
CAP	Corrective Action Plan (RCRA Underground Storage Tank program)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CMI	Corrective Measures Implementation (RCRA Corrective Action program)
CMO	Corrective Measures Operation (RCRA Corrective Action program)
CMS	Corrective Measures Study (RCRA Corrective Action program)
DES	Design (RCRA Corrective Action and UST program)
ER,N	Environmental Restoration, Navy funding
F	Future, number of sites with phase to be started in the future
FS	Feasibility Study (CERCLA program)
IMO	Implementation Operation (RCRA UST program)
IMP	Implementation (RCRA Underground Storage Tank program)
IRA	Interim Remedial Action (CERCLA program) also includes removal actions
LTM	Long-Term Management
NPL	National Priorities List
Non-NPL	Sites that are not listed on the National Priorities List
PA	Preliminary Assessment (CERCLA program)
RAC	Remedial Action Construction (CERCLA program)
RAO	Remedial Action Operation (CERCLA program)
RC	Response Complete, all cleanup actions completed
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design (CERCLA program)
RFA	RCRA Facility Assessment (RCRA Corrective Action program)
RFI	RCRA Facility Investigation (RCRA Corrective Action program)
RI	Remedial Investigation (CERCLA program)
SA	Site Assessment (RCRA UST program)
SI	Site Inspection (CERCLA program)
U	Underway, number of sites with phase underway
U (ACT)	Underway, number of sites with IRA underway (number of interim actions underway at the sites)
UST	RCRA Underground Storage Tank program

Names of installations are abbreviated in Appendix A and B. Complete names are provided in Appendix D.

A

APPENDIX A – Installation Restoration Program Status

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
ALASKA																									
Amchitka FSSC Det 1	11		11			4	2				4			7			5							1	9
Cape Prince of Wales NCCOSC	3		3				3							3			3					3(4)			3
Point Barrow NARL	13		13			1	12			2	5			10			5		4			7(8)			8
St. Lawrence NCCOSC	4		4				4							4			4					4(4)			4
Tin City NCCOSC	1		1				1							1			1					1(4)			1
TOTAL	**32**		**32**			**5**	**22**			**2**	**9**			**25**			**18**		**4**			**15(20)**		**1**	**25**
ARIZONA																									
Flagstaff NOS	2		2			2																			2
Sentinel NCCOSC	3		3			2	1							1			1					1(1)			3
Yuma MCAS	25	Yes	25				24			12	3			11			5	3	1		3	1(1)			20
TOTAL	**30**		**30**			**4**	**25**			**12**	**3**			**12**			**6**	**3**	**1**		**3**	**2(2)**			**25**
CALIFORNIA																									
Alameda NMCRC	2		1				1	1						1						1					
Azusa NCCOSC Morris Dam Facility	2		1	1		1																1(1)	1(1)		1
Barstow MCLB	42	Yes	41				41			30	8		1	10		1	2		2			9(9)		5	32
Bridgeport MCMWTC	18		18				14			3	8			9			1	3	2		1	5(5)		4	5
Camp Pendleton MCB	208	Yes	117	8	72	23	65	3	3	25	8	6	67	17	9	81	6	3	6	11	1	9(9)		9	55
Centerville Beach NAVFAC	10		10			3	6			3				1				1				3(13)			6
China Lake NAWS	89		74	3	11	4	22	2	11		9	1	15	14		16		8	10	4	1	6(6)	1(1)	4	5
Chocolate Mountain AGR	7		7			6								1			1					2(3)			7
Concord NWS	53	Yes	40	1	1		44	8	1			1	8	10	1	9		9		9		5(5)		7	
Corona NOC NWAD	2		2				1																		
Coronado NAB	6		5	1		1		4								2				1					1
Daly City EFA West	1		1			1																1(1)			1
Dixon NRTF	4		4				4															1(1)			
El Centro NAF	22		20	1		14	4		4		3		2	3	1	3			2			13(13)	1(1)		14
Fallbrook NOC, Pac Div Det	12		4	3	5	1	1		1				1			1				1					1
Imperial Beach OLF	5		3	2				1	3				3			3				3					
Lemoore NAS	19		16				15	4		10	4	2		3	2		1	1		1	1	4(14)		4	12
Long Beach NS San Pedro	3			3																					
Miramar MCAS	18		14	4		7	2		2					4	2	1	4		1	1		5(5)	1(1)		11
Monterey NPGS	3		3				1				1			1			1					1(1)			1
North Island NADEP	1		1											1											
North Island NAS	24		23			2	9	5	3	3		1	3	1	2	5			1	5		8(19)	1(1)	7	5

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
CALIFORNIA, continued																									
Pasadena MCRC	1		1																						
Pico Rivera MCRTC	1		1																						
Point Sur NAVFAC	1		1				1							1											
Pomona NIROP	3		3			3																			3
San Clemente Island NALF	18		4	1	13				9				6			7				3					
San Diego FASWTC Pac	6		6			6																			6
San Diego FCTC Pac	1		1				1				1			1								1(1)			
San Diego FISC	5		4	1		3	1			1												1(1)	1(1)		4
San Diego MCRD	8		8			3	1							1				1			1	1(1)		1	4
San Diego NAVMEDCTR	1		1																						
San Diego NCCOSC	12		8		4	2	4	2						2			1			2		2(2)	3(3)		3
San Diego NCTS	2		2			1																			1
San Diego NISE West	10		9	1			6	1					2			2			1	8			5(5)		
San Diego NS	23		18	1		4	7	8		3	1		2	1		2		4	1	2	4	5(5)	1(1)		11
San Diego NSB	9		6	1	2	6	1															1(1)			6
San Diego NTC	3		3			2	1				1								1						2
San Diego SPASURFLDSTA	1		1			1																1(1)			1
San Nicolas Island OLF	15		15			6	2			1				7			7								14
Seal Beach NWS	78		76	2		36	18	1	1	12	2			5		1		2	1			16(17)	1(1)	4	48
Skaggs Island NSGA	13		12			1	4	2			2			6			2					10(17)	1(1)		3
Stockton NCS	76		34			29	45			1	5			46			29	10				10(11)			59
Sunnyvale NIROP	16		16				5																		
Twentynine Palms MCAGCC	64		64			22	2			1	1			4			3	7	1	1	5	11(13)		2	31
Ventura County NB Point Mugu	37		28	4	1	17	10	3	2		3			6		2			8	1		5(5)		1	17
Ventura County NB Port Hueneme	28		19	2	2	6	4	12	2		1			4	2	10			2	2		3(3)			6
Warner Springs SERE Camp	1		1											1				1			1				1
TOTAL	**984**		**747**	**40**	**111**	**211**	**343**	**57**	**42**	**93**	**58**	**11**	**110**	**161**	**19**	**146**	**58**	**50**	**39**	**56**	**15**	**140(183)**	**17(17)**	**48**	**377**
COLORADO																									
Lowry AFB ARMFORAITC	5						5																		
TOTAL	**5**						**5**																		
CONNECTICUT																									
Bloomfield NWIRP	8		8				6				1	1	1			3				1		1(1)			
East Lyme NUWC	1		1						1				1			1				1					
New London NSB	29	Yes	28				23		2		8		9	10		9		2	2	9		8(10)		4	
New London NUWC Det	1		1																						
TOTAL	**39**		**38**				**29**		**3**		**9**	**1**	**11**	**10**		**13**		**2**	**2**	**11**		**9(11)**		**4**	

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
DISTRICT OF COLUMBIA																									
Anacostia NS	6		4	1			4	1			1			2				1						1	
Washington NAVOBSY	1		1											1				1				1(1)		1	
Washington NAVSECSTA	3		3				3															2(2)			
Washington Navy Yard	31	Yes	25				15	9	4	3	3			7		2	1	2		2		11(19)	2(2)		4
Washington NRL	3		3				2															2(3)			
TOTAL	**44**		**36**	**1**			**24**	**10**	**4**	**3**	**4**			**10**		**2**	**1**	**4**		**2**		**16(25)**	**2(2)**	**2**	**4**
FLORIDA																									
Jacksonville FISC	2		2				2			1	1			1				1			1				2
Jacksonville NAS	80	Yes	79			24	31		6	11	8		3	15		4	1	8	11	4	5	24(29)		3	41
Key West NAS	20		20			2	9			4	2			9			5	2	3		2	6(6)		8	13
Mayport NS	37		36			1	35			6	7			10				10	5	1	4	12(18)		12	11
Panama City CSS	20		18			6	13			6	3			2				2	6		1	7(7)		2	13
Pensacola NAS	61	Yes	59			4	43	4	4	22	21		4	5	1	16	2	1	12	18	1	17(20)		1	29
Pensacola NTTC Corry Station	4		4				1	3																	
Pensacola PWC	1		1																						
Saufley Field NAS	6		2		1			1	4		1		3		1	3				4					
Whiting Field NAS	46	Yes	41			2	44			22	4		1	5	1		1		6			13(13)		4	25
TOTAL	**277**		**262**		**1**	**39**	**178**	**8**	**14**	**72**	**47**		**11**	**47**	**3**	**23**	**9**	**24**	**43**	**27**	**14**	**79(93)**		**30**	**134**
GEORGIA																									
Albany MCLB	32	Yes	27			11	20			6	11			13	1		6	3	4	1	1	12(17)		2	24
Athens NAVSCSCOL	1		1				1				1			1				1				1(1)			
Atlanta NMCRC	1		1				1							1											
Kings Bay NSB	17		16				4			3	1			2					1			2(2)			3
TOTAL	**51**		**45**			**11**	**26**			**9**	**13**			**17**	**1**		**6**	**4**	**5**	**1**	**1**	**15(20)**		**2**	**27**
GUAM																									
Guam FISC	6		5			3	2		1		1			1				1				2(2)		1	3
Guam NAVACTS	26		26			8	17	1		8	6			7			6		1			10(12)		3	22
Guam NAVFAC	2		2				1			1												1(1)			1
Guam NAVREGDENCEN	1		1				1			1												1(1)			1
Guam NCTAMS WESTPAC	9		9			8			1																8
Guam NSRF	3		3				2		1	1										1		2(2)			1
Guam PWC	12		12			1	5	5		1	2			2			1	3	1		1	7(10)	5(5)	1	4
TOTAL	**59**		**58**			**20**	**28**	**6**	**3**	**12**	**9**			**10**			**7**	**4**	**2**	**1**	**1**	**23(28)**	**5(5)**	**5**	**40**

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
HAWAII																									
Barbers Point NAS	12		8	3		4	1		2		1			1								5(5)	2(2)	2	4
Barking Sands PMRF	5		4	1		2	2		1	2			1			1				1					4
Camp H.M. Smith Oahu	2		2				1												2			2(2)		1	
Kaneohe Bay MCB	26		18	3	5	2		1	5				1			1				4			1(1)	1	2
Lualualei NAVMAG	25		16	1		9	4	1	7	1	1		8			8		1	4	2	1	11(11)		1	11
Pearl Harbor FISC	14	Yes	12				10	3	1	6			3			3			4	2		5(8)	1(1)		6
Pearl Harbor INACTSHIPDET	1	Yes	1			1																			1
Pearl Harbor NS	28	Yes	15		4	5	14	2	7	3	2		6	2		6		1	8	3		15(15)		1	8
Pearl Harbor NSB	7	Yes	7			1	4		2	2			2			2			1			1(1)			3
Pearl Harbor NSY	26	Yes	21	2	1	8	8	1	6	5			3			3			4	2		6(10)		1	13
Pearl Harbor PWC	17	Yes	14	2	1	5	4	4	4	2	1		5			7			1	5		5(11)	2(2)		7
Wahiawa NCTAMS EASTPAC	30	Yes	24	4	1		14	6	9	10	3		7	2		12	2		2			8(11)	3(3)	1	12
TOTAL	**193**		**142**	**16**	**12**	**37**	**62**	**18**	**44**	**31**	**8**		**36**	**5**		**43**	**2**	**2**	**26**	**19**	**1**	**58(74)**	**9(9)**	**8**	**71**
IDAHO																									
Bayview NSWC	1		1				1																		
TOTAL	**1**		**1**				**1**																		
ILLINOIS																									
Great Lakes NTC	33		20	2	6	1	7	4	10		4		12	9		11		1	2		1	7(8)		2	2
TOTAL	**33**		**20**	**2**	**6**	**1**	**7**	**4**	**10**		**4**		**12**	**9**		**11**		**1**	**2**		**1**	**7(8)**		**2**	**2**
INDIANA																									
Crane NSWC	35		33		1	3	15	4	11	5	8		6	4	1	8			1	4		16(24)	4(4)	4	8
TOTAL	**35**		**33**		**1**	**3**	**15**	**4**	**11**	**5**	**8**		**6**	**4**	**1**	**8**			**1**	**4**		**16(24)**	**4(4)**	**4**	**8**
LOUISIANA																									
New Orleans NAS	15		14			4	8			7				2										1	11
New Orleans NSA	5		2				5																		
TOTAL	**20**		**16**			**4**	**13**			**7**				**2**										**1**	**11**
MAINE																									
Brunswick NAS	15	Yes	15				10				7			8				2				5(5)			
Cutler NCTS	4		3				2	2			1		1	1		1				3		3(3)	1(1)	1	
Portsmouth NSY Kittery	34	Yes	33	1			11	5	1			1	3	2	1	4			1	3		5(6)	3(3)		
TOTAL	**53**		**51**	**1**			**23**	**7**	**1**		**8**	**1**	**4**	**11**	**1**	**5**		**2**	**1**	**6**		**13(14)**	**4(4)**	**1**	

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
MARYLAND																									
Annapolis NS	2		2				1	1			1			1		1						1(1)			
Annapolis U.S. Naval Academy	8		7				4				1			1	1							2(3)			
Bainbridge NTC	5		5				3			2				1								5(9)		2	2
Baltimore NRC	1		1																			1(2)			
Bethesda NAVMEDCOM NATCAPREG	8		8					1					1			1						1(1)			
Carderock NSWC	9		5			2	7			7												4(5)			9
Cheltenham NCTC	4		4																			3(3)			
Chesapeake Bay Det NRL	8		8																						
Indian Head NSWC	68	Yes	63	1	1	23	33	4	7	11	17	2	9	10	2	13	8	1		9	1	7(12)	3(4)	2	43
Patuxent River NAS	62	Yes	39		3	21	21	4	8	5	8		11	9	2	12	5	3		2	2	9(9)		3	33
Pomonkey Test Range NRL	1		1																						
Solomons NAVRECCEN	1		1			1																			1
St. Inigoes NISE East Coast Det	2		1	1			2				2			1	1										
Waldorf NRL	1		1																			1(1)			
TOTAL	**180**		**146**	**2**	**4**	**47**	**71**	**10**	**15**	**25**	**29**	**2**	**21**	**23**	**6**	**27**	**13**	**4**		**11**	**3**	**34(46)**	**3(4)**	**7**	**88**
MASSACHUSETTS																									
Bedford NWIRP	4	Yes	4				2	2					1			2				2		2(5)	1(1)		
Quincy NRC	1		1				1																		
TOTAL	**5**		**5**				**3**	**2**					**1**			**2**				**2**		**2(5)**	**1(1)**		
MINNESOTA																									
Fridley NIROP	5	Yes	4				5				1			1					1			4(6)			
St. Paul NIROP	2		2																						
TOTAL	**7**		**6**				**5**				**1**			**1**					**1**			**4(6)**			
MISSISSIPPI																									
Gulfport NCBC	10		10			1	4	3	2			2	4		2	6			1	4		5(6)			1
Meridian NAS	7		7				5	2		1	1			1				1				3(3)		2	1
TOTAL	**17**		**17**			**1**	**9**	**5**	**2**	**1**	**1**	**2**	**4**	**1**	**2**	**6**		**1**	**1**	**4**		**8(9)**		**2**	**2**
MISSOURI																									
Kansas City MC Regional CO	1		1																					1	
TOTAL	**1**		**1**																					**1**	
MONTANA																									
Butte NRF	1		1																						
TOTAL	**1**		**1**																						

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
NEBRASKA																									
Lincoln NRC	2		2																						
TOTAL	**2**		**2**																						
NEVADA																									
Fallon NAS	29		23				27	2		20	6	1	1	2	3	2			1	6		6(6)	2(2)	6	20
TOTAL	**29**		**23**				**27**	**2**		**20**	**6**	**1**	**1**	**2**	**3**	**2**			**1**	**6**		**6(6)**	**2(2)**	**6**	**20**
NEW JERSEY																									
Earle NWS	69	Yes	69				51				13	1		16		2		5	4	2		14(15)		9	
Lakehurst NAWCAD	45	Yes	45				45				8			12				2	9			25(35)			
TOTAL	**114**		**114**				**96**				**21**	**1**		**28**		**2**		**7**	**13**	**2**		**39(50)**		**9**	
NEW YORK																									
Bethpage NWIRP	4		4				3	1			2			2	1					1		4(10)			
Binghamton NRC	1		1				1							1											
Calverton NWIRP	13		13				3	3			2	1	2	2		3			1	3		4(10)	1(1)		
Fishers Island NUSC	1		1				1																		
Floyd Bennett Field NMCRC	1		1				1															1(1)			
Syracuse MCRTC	1		1											1											
Watertown NRC	1		1				1																		
TOTAL	**22**		**22**				**10**	**4**			**4**	**1**	**2**	**6**	**1**	**3**			**1**	**4**		**9(21)**	**1(1)**		
NORTH CAROLINA																									
Camp Lejeune MCB	177	Yes	173				74	5			34	5	1	33	2	5		22	23	6		23(23)	2(2)	3	
Cherry Point MCAS	97	Yes	85			1	57	3		1	30			29	2			13	28	2	2	25(29)	2(2)	4	4
Wilmington NRC	1		1				1							1								1(1)			
TOTAL	**275**		**259**			**1**	**132**	**8**		**1**	**64**	**5**	**1**	**63**	**4**	**5**		**35**	**51**	**8**	**2**	**49(53)**	**4(4)**	**7**	**4**
OHIO																									
Toledo NWIRP	1						1				1			1										1	
TOTAL	**1**						**1**				**1**			**1**										**1**	
OKLAHOMA																									
Broken Arrow NMCRC	1		1				1							1											
TOTAL	**1**		**1**				**1**							**1**											

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
OREGON																									
Coos Bay NAV Ocean Processing FAC	1		1				1							1											
Portland NMCRRC	1		1											1				1				1(1)			
Salem NMCRC	1		1											1											
TOTAL	**3**		**3**				**1**							**3**				**1**				**1(1)**			
PENNSYLVANIA																									
Mechanicsburg SPCC	15	Yes	14			3	7	3		5	2	1	1	4		2	3		1	1		3(3)	1(1)	1	11
Philadelphia ASO	1		1				1							1					1					1	
Philadelphia NSWC-CD	10		9				8				2			3	1		1							1	1
Willow Grove NAS	9	Yes	9				2				1			4				1				3(3)			
Wyoming MCRC	2		2											2								1(1)			
TOTAL	**37**		**35**			**3**	**18**	**3**		**5**	**5**	**1**	**1**	**14**	**1**	**2**	**4**	**1**	**2**	**1**		**7(7)**	**1(1)**	**3**	**12**
PUERTO RICO																									
Roosevelt Roads Camp Garcia	12	Yes					1	11					5			5				1			1(1)		
Roosevelt Roads NS	59		41				36				1			2				2							
Sabana Seca NSGA	8		8				8				1			1								3(6)			
San Juan SUPSHIP	3		3																						
Vieques West	16	Yes					11	5			1			1	1				1			1(1)	3(3)	1	
TOTAL	**98**		**52**				**56**	**16**			**3**		**5**	**4**	**1**	**5**		**2**	**1**	**1**		**4(7)**	**4(4)**	**1**	
RHODE ISLAND																									
Newport NETC	29	Yes	26			7	8	12	1		3	1	9	7		11			2	6		8(10)	5(5)	1	7
TOTAL	**29**		**26**			**7**	**8**	**12**	**1**		**3**	**1**	**9**	**7**		**11**			**2**	**6**		**8(10)**	**5(5)**	**1**	**7**
SOUTH CAROLINA																									
Beaufort MCAS	44		37	1		18	12	2	7	1	3		1	5		2	1	1	6	2		2(2)		1	20
Charleston NWS	68		62			18	31	4	13	15	2			8			2	3	3		1	12(12)		5	36
Parris Island MCRD	25	Yes	24			6	7	5	3	1	3			5		1	3	2			1	7(7)	4(4)	4	11
TOTAL	**137**		**123**	**1**		**42**	**50**	**11**	**23**	**17**	**8**		**1**	**18**		**3**	**6**	**6**	**9**	**2**	**2**	**21(21)**	**4(4)**	**10**	**67**
TENNESSEE																									
Bristol NWIRP	9		8			4	5															4(5)		4	4
Knoxville NMCRC	1						1				1			1											
Mid-South NSA	42		41				27							3					3			13(13)			
TOTAL	**52**		**49**			**4**	**33**				**1**			**4**					**3**			**17(18)**		**4**	**4**

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
TEXAS																									
Corpus Christi NAS	21		21			11	10			2	4			2					5			1(1)			13
Dallas NWIRP	23		22			1	21			8	1			3	2					2		1(1)	1(1)		9
Kingsville NAS	20		20				13			1				6			4		1						5
Lubbock NMCRC	1		1				1							1											
McGregor NWIRP	19		17			9	9			2	2			4			1		5			3(3)			12
TOTAL	**84**		**81**			**21**	**54**			**13**	**7**			**16**	**2**		**5**		**11**	**2**		**5(5)**	**1(1)**		**39**
UTAH																									
Magna NIROP	16		16			3	13			13	1														16
TOTAL	**16**		**16**			**3**	**13**			**13**	**1**														**16**
VIRGINIA																									
Arlington Headquarters Battalion	1		1																			1(1)			
Arlington Service Center	3		3				3				2			2				1							
Chesapeake NSGA NWEST	4		4				4				1			1					1			1(1)			
Craney Island FISC	20		19				11				8			8			2	3	5		2	4(4)			4
Dahlgren NSWC	68	Yes	63	3		18	21	1	1	6	13			9	1	1	4		1	1		29(29)	3(3)	8	28
Dam Neck FCTC Atlantic	11		11				4			2												1(1)			2
Little Creek NAB	39	Yes	34			13	18	3			9		2	9	1	4	1	3	5	5		6(6)		1	14
Norfolk NB	62	Yes	57			7	37			1	11			19	1		1	7	7	3	1	18(18)	1(1)	3	10
Norfolk NSY	31	Yes	25			10	20	1		6	6			1		1		1	1		1	4(4)	1(1)		17
Oceana NAS	39		38				37			7	15			14			4	5	10		1	15(15)			12
Portsmouth NAVMEDCTR	2		2																			2(2)			
Quantico MCB	102	Yes	91	1		68	25	1		20	4	1		3		2	2			2		15(17)		1	90
St. Juliens Creek Annex	15	Yes	13			1	4	3			2		2	2		2			1	2		2(2)	1(1)		1
Yorktown FISC Fuels Division	21		21				3				2			2					1			1(1)			
Yorktown NWS	48	Yes	45			2	32	4	2	7	9		3	14	1	2		4		3		10(10)	3(3)	3	9
Yorktown NWS Cheatham Annex	17	Yes	8		1	5	3	4	4	1	1	1	3		1	3				1		1(1)	1(1)		6
TOTAL	**483**		**435**	**4**	**1**	**124**	**222**	**17**	**7**	**50**	**83**	**2**	**10**	**84**	**5**	**15**	**14**	**24**	**32**	**17**	**5**	**110(112)**	**10(10)**	**16**	**193**
WASHINGTON																									
Bangor NSB	42	Yes	40				25				17			27				6	6			14(25)			
Everett NRC	1		1											1											
Jim Creek NAVRADSTA	10		10				6			1				4								1(1)			1
Keyport NUWC	13	Yes	12				13			1	2			7			2		3			3(6)			3
Indian Island Naval Magazine	18		18				17			4	6			11			4	2			1	10(10)		1	9
Puget Sound FISC Bremerton	1	Yes	1				1				1			1					1						

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
WASHINGTON, continued																									
Puget Sound FISC Manchester	4		4				4				1			4				2			1	1(1)		1	1
Puget Sound NAVHOSP Bremerton	1	Yes	1																						
Puget Sound NS Everett	4		4				2							2											
Puget Sound NSY	34	Yes	34				24	1			16			30	2			3	7	1		26(26)			
Seattle NAVRESREDCEN	1		1				1							1											
Spokane NMCRC	1		1																						
Tacoma NMCRC	1		1											1								1(1)			
Whidbey Island NAS	91	Yes	90				54				25			61			6	2	8			57(68)		2	6
TOTAL	**222**		**218**				**147**	**1**		**6**	**68**			**150**	**2**		**12**	**15**	**25**	**1**	**2**	**113(138)**		**4**	**20**
WEST VIRGINIA																									
Allegany Ballistics Laboratory	41	Yes	36			5	27	7		15	2			3		4	1		3	1		11(11)	1(1)		21
Sugar Grove NSGA	3		3																						
TOTAL	**44**		**39**			**5**	**27**	**7**		**15**	**2**			**3**		**4**	**1**		**3**	**1**		**11(11)**	**1(1)**		**21**
GRAND TOTAL	**3716**		**3185**	**67**	**136**	**593**	**1785**	**212**	**180**	**412**	**488**	**29**	**246**	**752**	**52**	**338**	**162**	**192**	**282**	**195**	**50**	**841(1028)**	**78(79)**	**180**	**1217**

B

APPENDIX B – Munitions Response Program Status

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
ARIZONA																									
Yuma MCAS	7	Yes	2	2	3	2			5							4									2
TOTAL	**7**		**2**	**2**	**3**	**2**			**5**							**4**									**2**
CALIFORNIA																									
China Lake NAWS	2		1	1					2							2									
Concord NWS	4	Yes	1	1		1			3				3			3									1
Coronado NAB	1			1					1																
El Centro NAF	3			3					3							3									
Fallbrook NOC, Pac Div Det	7		2	3	2				7																
Miramar MCAS	14		5	9		5			7							7									5
North Island NAS	1				1				1				1			1				1					
San Clemente Island NALF	1		1											1			1								1
San Diego NS	2		1	1				1	1							1									
San Diego SPASURFLDSTA	1		1			1																			1
Seal Beach NWS	5		3		2	3																			3
Stockton NCS	1		1			1																			1
Ventura County NB Point Mugu	4			4					3							3									
Ventura County NB Port Hueneme	2			2					2							2									
TOTAL	**48**		**16**	**25**	**5**	**11**		**1**	**30**				**4**	**1**		**22**	**1**			**1**					**12**
COLORADO																									
Lowry AFB ARMFORAITC	1						1									1									
TOTAL	**1**						**1**									**1**									
DISTRICT OF COLUMBIA																									
Anacostia NS	2		2																						
Washington Navy Yard	1	Yes		1																					
Washington NRL	5				5				5																
TOTAL	**8**		**2**	**1**	**5**				**5**																
FLORIDA																									
Jacksonville NAS	1	Yes		1					1											1					
Whiting Field NAS	1	Yes		1					1							1									
TOTAL	**2**			**2**					**2**							**1**				**1**					

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
GUAM																									
Guam NAVACTS	1			1																					
Guam COMNAVMARIANAS	1			1					1							1									
TOTAL	**2**			**2**					**1**							**1**									
HAWAII																									
Barking Sands PMRF	1			1					1																
Camp H.M. Smith Oahu	3		1	2					3																
Kaneohe Bay MCB	6			6					6											1					
Lualualei NAVMAG	10		1	9		1			8							3						1(1)			1
Pearl Harbor NS	1	Yes	1																			1(1)		1	
TOTAL	**21**		**3**	**18**		**1**			**18**							**3**				**1**		**2(2)**		**1**	**1**
ILLINOIS																									
Great Lakes NTC	5		4	1		3										1									3
TOTAL	**5**		**4**	**1**		**3**										**1**									**3**
INDIANA																									
Crane NSWC	6		1	5		1			3																1
TOTAL	**6**		**1**	**5**		**1**			**3**																**1**
LOUISIANA																									
New Orleans NAS	1			1																		1(1)			
TOTAL	**1**			**1**																		**1(1)**			
MAINE																									
Portsmouth NSY Kittery	1	Yes	1																						
TOTAL	**1**		**1**																						
MARYLAND																									
Carderock NSWC	5		5			5																			5
Chesapeake Bay Det NRL	3			3												2									
Indian Head NSWC	32	Yes	6	26		3	1		15				3		1	14								1	3
Solomons NAVRECCEN	5		2	2				1															(2)2		
TOTAL	**45**		**13**	**31**		**8**	**1**	**1**	**15**				**3**		**1**	**16**							**(2)2**	**1**	**8**

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
NEW JERSEY																									
Earle NWS	1	Yes	1																						
Lakehurst NAWCAD	6	Yes	5	1			1		5				2			3									
TOTAL	**7**		**6**	**1**			**1**		**5**				**2**			**3**									
NORTH CAROLINA																									
Camp Lejeune MCB	14	Yes		7	7				14				1			14									
Cherry Point MCAS	3	Yes		3					3				3			3				3					
TOTAL	**17**			**10**	**7**				**17**				**4**			**17**				**3**					
PENNSYLVANIA																									
Mechanicsburg NICP	1	Yes							1																
TOTAL	**1**								**1**																
PUERTO RICO																									
Roosevelt Roads NS	1		1																						
Vieques East	1	Yes		1					1				1		1										
Vieques West	1	Yes			1			1				1				1								1	
TOTAL	**3**		**1**	**1**	**1**			**1**	**1**			**1**	**1**		**1**	**1**								**1**	
RHODE ISLAND																									
Newport NETC	2	Yes	1	1					1				1			1									
TOTAL	**2**		**1**	**1**					**1**				**1**			**1**									
SOUTH CAROLINA																									
Beaufort MCAS	5		2	3		2			3							3									2
Charleston NWS	7		2	3	2			1	6																
Parris Island MCRD	8	Yes		8					8							8									
TOTAL	**20**		**4**	**14**	**2**	**2**		**1**	**17**							**11**									**2**
TENNESSEE																									
Mid-South NSA	1			1					1				1			1				1					
TOTAL	**1**			**1**					**1**				**1**			**1**				**1**					
TEXAS																									
Corpus Christi NAS	3		1	2					2				2			2									
TOTAL	**3**		**1**	**2**					**2**				**2**			**2**									

	Total # of Sites	On NPL	PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
			C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
VIRGINIA																									
Chesapeake NSGA NWEST	1			1																					
Little Creek NAB	1	Yes			1				1																
Oceana NAS	1			1					1																
Quantico MCB	23	Yes		23					14							14									
Yorktown NWS	1	Yes	1						1							1									
Yorktown NWS Cheatham Annex	1	Yes	1						1							1									
TOTAL	**28**		**2**	**25**	**1**				**18**							**16**									
WASHINGTON																									
Bangor NSB	1	Yes	1				1								1										
Jim Creek NAVRADSTA	1		1			1																			1
Indian Island Naval Magazine	1		1			1																			1
Puget Sound NAVHOSP Bremerton	1	Yes	1					1				1				1						1(1)			
Puget Sound NSY	2	Yes	2					2					1		1	1				1		1(1)			
Whidbey Island NAS	4	Yes		4					4							3									
TOTAL	**10**		**6**	**4**		**2**	**1**	**3**	**4**			**1**	**1**		**2**	**5**				**1**		**2(2)**			**2**
GRAND TOTAL	**239**		**63**	**147**	**24**	**30**	**4**	**7**	**146**			**2**	**19**	**1**	**4**	**106**	**1**			**8**		**5(5)**	**2(2)**	**3**	**31**

C APPENDIX C – Environmental Restoration Totals

Installation Restoration Program Totals

	Total # of Sites	C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
		PA/SI				RI/FS				RD			RAC				RAO				IRA		TOTAL	
IRP REGULATION																								
CERCLA	2376	2027	55	52	463	1077	177	130	293	288	27	151	399	36	219	114	73	145	155	15	563(702)	67(68)	108	885
		RFA				RFI/CMS				DES			CMI				CMO				IRA		TOTAL	
RCRA CA	682	554	7	72	77	336	29	32	103	59	2	79	70	8	95	24	21	42	24	9	132(167)	11(11)	42	213
		SA				CAP				DES			IMP				IMO				IRA		TOTAL	
UST	658	604	5	12	53	372	6	18	16	141	0	16	283	8	24	24	98	95	16	26	146(159)	0(0)	30	119
TOTAL	**3716**	**3185**	**67**	**136**	**593**	**1785**	**212**	**180**	**412**	**488**	**29**	**246**	**752**	**52**	**338**	**162**	**192**	**282**	**195**	**50**	**841(1028)**	**78(79)**	**180**	**1217**

	Total # of Sites	C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
		PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
IRP NPL																								
NPL	1532	1345	17	15	236	834	119	70	230	252	20	103	289	24	149	58	51	122	102	12	406(489)	43(44)	63	536
Non-NPL	2184	1840	50	121	357	951	93	110	182	236	9	143	463	28	189	104	141	160	93	38	435(539)	35(35)	117	681
TOTAL	**3716**	**3185**	**67**	**136**	**593**	**1785**	**212**	**180**	**412**	**488**	**29**	**246**	**752**	**52**	**338**	**162**	**192**	**282**	**195**	**50**	**841(1028)**	**78(79)**	**180**	**1217**

Munitions Response Program Totals

	Total # of Sites	C	U	F	RC	C	U	F	RC	C	U	F	C	U	F	RC	C	U	F	RC	C(ACT)	U(ACT)	LTM	RC
		PA/SI/RFA/SA				RI/FS/RFI/CMS/CAP				RD/DES			RAC/CMI/IMP				RAO/CMO/IMO				IRA		TOTAL	
MRP NPL																								
NPL	116	24	77	12	7	3	4	76	0	0	2	15	0	4	71	0	0	0	4	0	2(2)	0(0)	2	7
Non-NPL	123	39	70	12	23	1	3	70	0	0	0	4	1	0	35	1	0	0	4	0	3(3)	2(2)	1	24
TOTAL	**239**	**63**	**147**	**24**	**30**	**4**	**7**	**146**	**0**	**0**	**2**	**19**	**1**	**4**	**106**	**1**	**0**	**0**	**8**	**0**	**5(5)**	**2(2)**	**3**	**31**

All Sites

GRAND TOTAL	**3955**	**3248**	**214**	**160**	**623**	**1789**	**219**	**326**	**412**	**488**	**31**	**265**	**753**	**56**	**444**	**163**	**192**	**282**	**203**	**50**	**846(1033)**	**80(81)**	**183**	**1248**

D APPENDIX D – Installation Summaries

Appendix D presents the details of projected cleanup plans for individual Navy and Marine Corps installations with sites in the Installation Restoration Program (IRP) and Munitions Response Program (MRP). This information is presented in tabular form with the installations organized by state. The states are presented in alphabetical order, with the installations in alphabetical order under them.

For each installation, a brief description of the mission of the particular installation is provided along with an icon depicting the type of mission. In some instances, the installation has a secondary mission and will have two icons, one for the primary mission and one for the secondary mission. An explanatory legend for the icons is given on page D-2.

An explanation of each of the columns in the table is provided below.

NPL

The EPA's National Priorities List (NPL) includes installations receiving an EPA Hazard Ranking System score greater than 28.5. The NPL column indicates whether or not the installation is listed on the NPL.

RAB

Restoration Advisory Boards (RABs) are an important community outreach and public participation tool. RABs have been formed at all major installations undergoing cleanup where there is sufficient and sustained community interest. The RAB column indicates whether or not a RAB was established for that installation. The RAB may or may not be active at present.

IRP

The IRP column indicates the number of sites that the installation has in the Installation Restoration Program.

MRP

The MRP column indicates the number of sites that the installation has in the Munitions Response Program.

Sites with Remedy in Place in Place or Response Complete #(%)

These columns show the cumulative number of sites (and percent of sites) that will reach Remedy in Place (RIP) or Response Complete (RC) status by the end of each year. RIP status indicates that construction of the final remedy has been completed and it is operating as designed. RC status indicates that all cleanup actions for the site have been completed. All IRP sites are expected to achieve RIP/RC by the year 2014.

Future MRP-RIP/RC

The Future MRP-RIP/RC column indicates the projected year that all sites at the installation will be RIP/RC for those sites that have projected completion beyond 2014. Only MRP sites have projected RIP/RC beyond 2014.

Funding to Date

The Funding to Date amounts reflect the total amount of money spent on study and cleanup at each installation through September 2007.

Cost to Complete

The Cost to Complete funding amount reflects the total amount of money estimated to be needed to complete all cleanup work at the installation beginning with the year FY00.

Phase

These columns present the number of sites at each installation in various program phases. The Study phase includes the preliminary assessment (PA), site inspection (SI), and remedial investigation/feasibility study (RI/FS) phases. The Cleanup phase includes sites in the remedial design (RD) and remedial action (RA) phases as well as sites that have their final remedy in place (RIP). The Response Complete (RC) phase includes a count of all sites where all cleanup actions have been completed.

Explanation of Mission Icons

Aircraft
Installations whose main mission is operating Naval or Marine Corps aircraft.

Amphibious
Installations whose main mission is operating amphibious equipment and forces.

Communications
Installations whose main mission is operating communications-type equipment.

Helicopter
Installations whose main mission is operating Navy or Marine Corps helicopters.

Housing
Installations whose main mission is providing housing for Navy and Marine Corps personnel and their families.

Medical
Installations whose main mission is operating medical or dental facilities.

Research
Installations whose main mission is research, development, test and evaluation.

Reserves/Recruits
Installations whose main mission is supporting and training reserve units and new recruits.

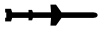
Service/Supply/Support
Installations whose main mission is providing supplies, services and support to the fleet and operating forces.

Ships
Installations whose main mission is operating surface ships.

Submarines
Installations whose main mission is operating submarines.

Ships/Submarines
Installations whose main mission is operating both ships and submarines.

Training
Installations whose main mission is training.



Weapons - General
Installations whose main mission is operating a facility for producing, developing, testing or operating general weapons systems.

Weapons - Aircraft
Installations whose main mission is operating a facility for producing, developing, testing or operating aircraft weapons systems.

Weapons - Ship/Surface
Installations whose main mission is operating a facility for producing, developing, testing or operating ships weapons systems.

Weapons - Submarine
Installations whose main mission is operating a facility for producing, developing, testing or operating submarine weapons systems.

D APPENDIX D – Installation Summaries

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
ALASKA																		
Amchitka Fleet Surveillance Support Command Detachment 1 Previously provided wide area air surveillance using relocatable, over-the-horizon radar; radar facilities were moved to Chesapeake, VA.																		
	No	No	11	0	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	N/A	$8,813,000	$179,000	0	2	9
Cape Prince of Wales Naval Command Control and Ocean Surveillance Center Conducts Arctic experiments and gathers weather information.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$5,886,000	$0	0	0	3
Point Barrow Naval Arctic Research Laboratory Conducts Arctic Research.																		
	No	Yes	13	0	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	N/A	$46,947,000	$1,840,000	0	5	8
St. Lawrence Naval Command Control and Ocean Surveillance Center Provided telecommunications link to desolate parts of Alaska; currently inactive.																		
	No	No	4	0	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	N/A	$5,998,000	$0	0	0	4
Tin City Naval Command Control and Ocean Surveillance Center Provided telecommunications link to desolate parts of Alaska; currently inactive.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$1,269,000	$0	0	0	1
ARIZONA																		
Flagstaff Naval Observatory Station Provides, analyzes, and interprets astrometric and photometric dark sky observations, data for navigation, positioning and communications; conducts research to improve observational methods and accuracy of astronomical data required by the Navy and DoD.																		
	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$0	$0	0	0	2
Sentinel Naval Command Control and Ocean Surveillance Center Supports wave propagation projects and surveys; plans, designs, and constructs very low frequency antennas for communication with satellites.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$196,000	$0	0	0	3
Yuma Marine Corps Air Station Provides aerial weapons training and tactical aircrew combat training for the Atlantic and Pacific Fleet Marine Forces and Navy, and aviation base for Marine Corps.																		
	Yes	Yes	25	7	27 84%	27 84%	27 84%	27 84%	27 84%	27 84%	27 84%	27 84%	2017	$50,833,000	$14,121,000	5	5	22

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA																		
Alameda Naval and Marine Corps Reserve Center Closed; NAVFAC is caretaker until transfer. Previously maintained and operated facilities and provided services and material support operations for Naval aviation activities and operating forces.																		
	No	No	2	0	1 50%	1 50%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$1,135,000	$1,043,000	1	1	0
Azusa Naval Command Control and Ocean Surveillance Center, Morris Dam Facility Tests and evaluates torpedoes and torpedo components.																		
	No	No	2	0	1 50%	1 50%	1 50%	1 50%	2 100%	2 100%	2 100%	2 100%	N/A	$5,037,000	$4,465,000	1	0	1
Barstow Marine Corps Logistics Base Originally conducted industrial operations; currently provides logistics support for Marine Corps forces in the western U.S. and Asia/Pacific arena; maintains, repairs, rebuilds, stores, and distributes supplies and equipment.																		
	Yes	No	42	0	41 98%	41 98%	41 98%	41 98%	42 100%	42 100%	42 100%	42 100%	N/A	$105,787,000	$35,208,000	0	10	32
Bridgeport Marine Corps Mountain Warfare Training Center Provides training and limited logistics support to deploying Marine Corps forces; develops, tests, and evaluates equipment for cold weather and mountain operations.																		
	No	No	18	0	18 100%	18 100%	18 100%	18 100%	18 100%	18 100%	18 100%	18 100%	N/A	$17,680,000	$1,944,000	0	13	5
Camp Pendleton Marine Corps Base Provides training facilities, logistical support and administrative support, and housing to Fleet Marine Corps Units, both active-duty and reserves, as well as Army and Navy units; national, state, and local agencies.																		
	Yes	No	208	0	114 55%	116 56%	118 57%	120 58%	129 62%	132 63%	135 65%	208 100%	N/A	$182,363,000	$105,746,000	82	71	55
Centerville Beach Naval Facility Commissioned in 1958 for oceanographic research.																		
	No	No	10	0	10 100%	10 100%	10 100%	10 100%	10 100%	10 100%	10 100%	10 100%	N/A	$6,765,000	$58,000	0	4	6
China Lake Naval Air Weapons Station Provides integrated warfare systems and life-cycle support; performs RDT&E, logistics, and in-service support for guided missiles, free-fall weapons, targets, support equipment, crew systems, and electronic warfare; integrates weapons and avionics on tactical aircraft; operates land and sea range test and evaluation complex.																		
	No	Yes	89	2	58 64%	58 64%	60 66%	61 67%	65 71%	67 74%	73 80%	90 99%	2015	$95,880,000	$59,376,000	28	58	5
Chocolate Mountain Aerial Gunnery Range Provides MCAS Yuma with a large and diversified assortment of ground targets for live-fire aerial gunnery, air-to-ground bombing and strafing training by Marine Corps and Navy pilots. The SEAL Camp is used for desert training and readiness operations.																		
	No	No	7	0	7 100%	7 100%	7 100%	7 100%	7 100%	7 100%	7 100%	7 100%	N/A	$126,000	$0	0	0	7

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA, continued																		
Concord Naval Weapons Station Major Navy ammunition transshipment port of the West Coast; ships, receives, inspects, and classifies munitions (tidal area); serves as munitions storage and weapons maintenance, inspection, and testing facility (inland area).																		
	Yes	Yes	53	4	44 77%	45 79%	46 81%	49 86%	50 88%	52 91%	54 95%	54 95%	2018	$68,201,000	$118,201,000	12	44	1
Corona Naval Ordnance Center Naval Warfare Assessment Division Provides materials and services to support ordnance systems.																		
	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$0	$0	0	2	0
Coronado Naval Amphibious Base Provides facilities and services for support of amphibious, unconventional, in-shore, riverine, maritime special operations forces, and special warfare.																		
	No	Yes	6	1	1 14%	1 14%	2 29%	2 29%	6 86%	6 86%	7 100%	7 100%	N/A	$9,065,000	$16,001,000	6	0	1
Daly City Engineering Field Division West Closed and transferred San Bruno Property; previously provided engineering and support services to Naval facilities within area of cognizance.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$53,000	$0	0	0	1
Dixon Naval Radio Transmitting Facility Provides transmitter support for Naval Communication Station, Stockton.																		
	No	No	4	0	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	N/A	$2,130,000	$0	0	4	0
El Centro Naval Air Facility Maintains and operates aviation facilities for gunnery, bombing, carrier landings, and air combat training; provides services and material to support operations of aviation activities, operation forces, and other activities.																		
	No	No	22	3	17 68%	17 68%	17 68%	17 68%	18 72%	18 72%	20 80%	23 92%	2016	$38,010,000	$23,120,000	7	4	14
Fallbrook Naval Ordnance Center, Pacific Division Detachment Stores fleet and Marine Corps missiles and conventional ammunition; maintains facilities of air-launched missiles.																		
	No	No	12	7	3 16%	3 16%	4 21%	5 26%	8 42%	8 42%	9 47%	14 74%	2017	$2,937,000	$15,090,000	16	2	1
Imperial Beach Outlying Landing Field Provides facilities and maintenance in support of helicopter training in conjunction with NAS North Island.																		
	No	No	5	0	0 0%	0 0%	0 0%	0 0%	2 40%	3 60%	3 60%	5 100%	N/A	$1,258,000	$11,643,000	5	0	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA, continued																		
Lemoore Naval Air Station Maintains and operates facilities and provides services and materials to support operations of aviation activities.																		
	No	No	19	0	15 79%	18 95%	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	N/A	$30,735,000	$5,516,000	4	3	12
Long Beach Naval Station San Pedro Closed; NAVFAC is caretaker until transfer. Previously provided support and housing.																		
	No	Yes	3	0	0 0%	0 0%	0 0%	1 33%	1 33%	1 33%	1 33%	3 100%	N/A	$4,863,000	$5,672,000	3	0	0
Miramar Marine Corps Air Station Miramar MCAS provides facilities, services, and materials to support operations of aviation units of the Fleet Marine Forces, and other Naval aviation units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.																		
	No	Yes	18	14	17 53%	17 53%	17 53%	21 66%	24 75%	25 78%	25 78%	25 78%	2017	$14,104,000	$25,796,000	13	3	16
Monterey Naval Post Graduate School Enhance security through graduate and professional education programs focusing on the unique needs of the military officer, increase combat effectiveness of U.S. armed forces, and contribute to fundamental scientific, engineering, policy, and operational advances of the Navy, DoD, and other national security agencies.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$1,390,000	$0	0	2	1
North Island Naval Air Station Maintains and operates facilities and provides services and materials to support operations of aviation activities, homeport for 3 aircraft carriers and the Deep Submergence Rescue Vehicles.																		
	No	Yes	24	1	14 56%	15 60%	15 60%	16 64%	20 80%	22 88%	23 92%	25 100%	N/A	$158,303,000	$65,847,000	9	11	5
North Island Naval Aviation Depot Refurbishes Naval aircraft and components for the U.S. Navy and other governments; maintains capability to test, disassemble, repair, manufacture, rebuild, and calibrate much of the U.S. Navy's inventory of aircraft and components.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
Pasadena Marine Corps Reserve Center Provides training, administrative, and mobilization support for Marine Corps Reserves.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$191,000	$0	0	1	0
Pico Rivera Marine Corps Reserve Training Center Provides training and administrative support for Marine Corps Reserve Units.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$58,000	$0	0	1	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA, continued																		
Point Sur Naval Facility Operates automated data gathering equipment.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$172,000	$0	0	1	0
Pomona Naval Industrial Reserve Ordnance Plant Government-Owned Contractor-Operated (GOCO) facility provides development, design, engineering, test, production, and depot-level support of tactical, non-nuclear, surface and air launched weapons for the Naval Sea Systems Command.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$0	$0	0	0	3
San Clemente Island Naval Auxiliary Landing Field Shore bombardment area for Pacific Fleet operations and training; research, development, testing, and evaluation of missiles and missile systems; Navy and Marine training.																		
	No	No	18	1	3 16%	3 16%	6 32%	7 37%	10 53%	11 58%	13 68%	19 100%	N/A	$12,250,000	$18,054,000	16	2	1
San Diego Fleet and Industrial Supply Center Provides logistics, business, and support services to fleet, shore, and industrial commands of the Navy, Coast Guard, and Military Sealift Command; combat capability supply chain management, procurement, contracting and transportation services, technical/customer support, defense fuel products.																		
	No	No	5	0	4 80%	4 80%	4 80%	4 80%	4 80%	5 100%	5 100%	5 100%	N/A	$3,927,000	$11,620,000	1	0	4
San Diego Fleet Antisubmarine Warfare Training Center Pacific Provides tactical, technical, and military training in antisubmarine warfare.																		
	No	No	6	0	6 100%	6 100%	6 100%	6 100%	6 100%	6 100%	6 100%	6 100%	N/A	$1,164,000	$0	0	0	6
San Diego Fleet Combat Training Center Pacific Provides training in aviation maintenance administration, acoustic analysis, Survival Evasion Resistance and Escape training; antisubmarine warfare/electronic warfare training in systems, equipment, and tactics; also provides audiovisual and graphic services.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$7,933,000	$0	0	1	0
San Diego Marine Corps Recruit Depot Provides recruiting, basic training, and support for Marine Corps recruits.																		
	No	Yes	8	0	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	N/A	$1,632,000	$52,000	0	4	4
San Diego Naval Command Control and Ocean Surveillance Center Principal Navy Research, Development, Test and Evaluation (RDT&E) center for command control, communications, ocean surveillance, surface and air launched undersea weapons systems.																		
	No	No	12	0	5 42%	5 42%	7 58%	7 58%	7 58%	7 58%	9 75%	12 100%	N/A	$23,557,000	$5,969,000	6	3	3

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA, continued																		
San Diego Naval Computer and Telecommunications Station Provides support to fleet and shore commands through rapid, reliable, and secure communications, information technology, and cryptology services.																		
	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$208,000	$0	0	1	1
San Diego Naval In-Service Engineering West Communications and electronic systems support to Fleet.																		
	No	No	10	0	1 10%	1 10%	2 20%	9 90%	9 90%	9 90%	9 90%	10 100%	N/A	$5,714,000	$8,537,000	2	8	0
San Diego Naval Medical Center Provides general and specialized hospital and cleanup services in support of the Armed Forces and maintains medical readiness.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
San Diego Naval Station Provides logistical and personnel support to 25 major tenant commands, provides berthing and port services for ships, provides shore based training and shore activities for all ship crews.																		
	No	Yes	23	2	14 56%	14 56%	15 60%	19 76%	21 84%	21 84%	23 92%	24 96%	2017	$105,460,000	$39,856,000	11	3	11
San Diego Naval Submarine Base Operates shore facilities in support of the submarine force, U.S. Pacific Fleet and is home port for two submarine squadrons.																		
	No	No	9	0	6 67%	6 67%	6 67%	6 67%	6 67%	6 67%	7 78%	9 100%	N/A	$1,106,000	$2,860,000	3	0	6
San Diego Naval Training Center Closed; NAVFAC is caretaker until transfer. Previously provided recruit training for enlisted personnel and primary, advanced, and specialized training for officers and enlisted personnel.																		
	No	Yes	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$8,643,000	$649,000	0	1	2
San Diego Space Surveillance Field Station Operates antennas to receive signals reflected off satellites.																		
	No	No	1	1	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$228,000	$0	0	0	2
San Nicolas Island, Outlying Landing Field Serves as launch platform for short and medium range missile testing, and observation for missile testing and diverse test and research functions.																		
	No	Yes	15	0	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	N/A	$6,599,000	$0	0	1	14

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
CALIFORNIA, continued																		
Seal Beach Naval Weapons Station Receives, stores, maintains, and issues conventional ammunition and surface and air launched guided missiles; maintains and operates ordnance systems component rework facility; distributes, maintains, stores, and issues materials.																		
	No	Yes	78	5	78 94%	78 94%	78 94%	82 99%	82 99%	82 99%	82 99%	83 100%	N/A	$72,692,000	$33,257,000	5	27	51
Skaggs Island Naval Security Group Activity Provides receiving facilities for point-to-point, ship to shore, local harbor and inter/intra-district communicators; provides high frequency direction finding for use in search and rescue operations and provides communications support.																		
	No	No	13	0	11 85%	12 92%	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	N/A	$9,676,000	$81,000	2	8	3
Stockton Naval Communications Station Closed by Major Claimant; managed, operated, and maintained facilities, equipment, and devices necessary to provide communications for the Department of the Navy.																		
	No	Yes	76	1	77 100%	77 100%	77 100%	77 100%	77 100%	77 100%	77 100%	77 100%	N/A	$55,560,000	$7,570,000	0	17	60
Sunnyvale Naval Industrial Reserve Ordnance Plant Government Owned-Contractor Operated (GOCO) facility operated by Lockheed Missiles and Space Company, Inc.; manufactures Naval Fleet Ballistic Missiles and provides assembly and testing of components.																		
	No	No	16	0	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	N/A	$147,000	$0	0	16	0
Twentynine Palms Marine Corps Air to Ground Combat Center Provides support to Marine Corps Air Ground Task Forces and Marine Corps tenant activities; administers the Marine Corps Air Ground Combined Arms Training Program; provides training in communications and electronics.																		
	No	No	64	0	63 98%	64 100%	64 100%	64 100%	64 100%	64 100%	64 100%	64 100%	N/A	$32,937,000	$1,239,000	0	33	31
Ventura County Naval Base Point Mugu Performs development, test and evaluation, and follow-on engineering, logistic and training support for Naval weapons systems; provides major range and technical support for fleet users. Formerly Point Mugu Naval Air Weapons Station.																		
	No	Yes	37	4	28 68%	28 68%	29 71%	30 73%	33 80%	33 80%	36 88%	39 95%	2015	$52,212,000	$23,089,000	13	11	17
Ventura County Naval Base Port Hueneme Provides support to Naval Construction Force, fleet units, and assigned organizational elements. Formerly Port Hueneme Naval Construction Battalion Center; Navy Civil Engineering Laboratory sites closed and transferred under BRAC III.																		
	No	Yes	28	2	10 33%	10 33%	10 33%	10 33%	19 63%	20 67%	24 80%	29 97%	2015	$56,180,000	$22,945,000	19	5	6
Warner Springs Survival, Evasion, Resistance and Escape Camp Provides training in survival, evasion, resistance, and escape for Pacific fleet Naval Aviators (AIRPAC) and other personnel.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$1,081,000	$0	0	0	1

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
COLORADO																		
Lowry Air Force Base Armed Forces Air Intelligence Training Center Formerly an ordnance/explosives research site operated by the University of Denver under contract to federal agencies; now leased to the Navy by the state of Colorado.	No	No	5	1	5 83%	5 83%	5 83%	5 83%	5 83%	5 83%	5 83%	5 83%	2016	$470,000	$6,385,000	0	6	0
CONNECTICUT																		
Bloomfield Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) facility provides design, test and manufacture helicopter and aerospace products; tests and evaluates helicopters.	No	No	8	0	5 63%	5 63%	5 63%	6 75%	7 88%	8 100%	8 100%	8 100%	N/A	$4,923,000	$12,182,000	0	8	0
East Lyme Naval Undersea Warfare Center Provides RDT&E of new underwater acoustic test equipment and methodology; open water test site for underwater electroacoustic devices.	No	No	1	0	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	N/A	$90,000	$4,153,000	1	0	0
New London Naval Submarine Base Homeports submarines, provides submarine intermediate maintenance and repairs, submarine training, submarine medical research.	Yes	Yes	29	0	20 69%	20 69%	21 72%	26 90%	28 97%	28 97%	28 97%	29 100%	N/A	$62,880,000	$32,190,000	2	27	0
New London Naval Underwater Warfare Center Detachment Research and development of submarine sonar, combat fire control, weapons, torpedo systems, and electromagnetic systems.	No	Yes	1	1	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$195,000	$0	0	1	0
DISTRICT OF COLUMBIA																		
Anacostia Naval Station Provides services and material for support of Navy military personnel and functions, including air operations, communications, armories, photographic and imaging media center, and research laboratories.	No	Yes	6	2	7 88%	7 88%	7 88%	7 88%	7 88%	8 100%	8 100%	8 100%	N/A	$3,451,000	$535,000	1	7	0
Washington Naval Observatory Performs astrometry, supports navigation and astronomical research; determines and distributes timing and astronomical data required for accurate navigation and fundamental astronomy; serves as the official source of time for DoD and for the United States.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$579,000	$49,000	0	1	0
Washington Naval Research Laboratory As Navy's corporate laboratory, conducts a broadly based, multidisciplinary program of scientific research and advanced technological development directed toward maritime applications of new and improved materials, techniques, equipment, system, and ocean, atmospheric, and space sciences and related technologies.	No	No	3	5	3 38%	3 38%	3 38%	3 38%	3 38%	8 100%	8 100%	8 100%	N/A	$22,000	$1,920,000	5	3	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
DISTRICT OF COLUMBIA, continued																		
Washington Naval Security Station Provides Naval communication services.																		
	No	Yes	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$3,978,000	$0	0	3	0
Washington Navy Yard Provides supply and administration services.																		
	Yes	Yes	31	1	18 56%	23 72%	25 78%	27 84%	31 97%	32 100%	32 100%	32 100%	N/A	$29,974,000	$7,893,000	14	14	4
FLORIDA																		
Jacksonville Fleet and Industrial Supply Center Provides supply support services to Fleet Units and activities of the Atlantic Fleet and others; logistic support to Navy Reserve; defense fuel support point for DLA-owned bulk petroleum products in support of assigned units, maintain a fuel testing laboratory for Quality Control of Bulk Petroleum Products.																		
	No	Yes	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$2,736,000	$0	0	0	2
Jacksonville Naval Air Station Provides services and support operations for aviation activities and aircraft overhaul. The complex houses a Naval aviation depot, a Naval supply center, and several air squadrons.																		
	Yes	Yes	80	1	73 90%	73 90%	74 91%	76 94%	78 96%	79 98%	79 98%	81 100%	N/A	$92,844,000	$18,866,000	7	33	41
Key West Naval Air Station Maintains and operates facilities and provides services and materials to support operations of aviation activities; Partial closure under BRAC IV.																		
	No	Yes	20	0	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	N/A	$31,819,000	$6,738,000	0	7	13
Mayport Naval Station Major Surface and Air Warfare organization, provides ship and on-shore maintenance for 34 ships, harbor and airfield facilities, and operations and training for antisubmarine warfare.																		
	No	Yes	37	0	36 97%	36 97%	37 100%	37 100%	37 100%	37 100%	37 100%	37 100%	N/A	$36,157,000	$4,001,000	0	26	11
Panama City Coastal Systems Station Serves as a major research, development, testing and evaluation laboratory and in-service support for amphibious warfare, diving, maritime special operations, mine warfare, and other Naval coastal region missions.																		
	No	Yes	20	0	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	N/A	$14,054,000	$1,514,000	0	7	13
Pensacola Naval Air Station Provides flight training (fixed-wing and rotary), provides maintenance as a Naval Aviation Depot (NADEP), and support to tenants and other customers.																		
	Yes	Yes	61	0	43 70%	43 70%	45 74%	52 85%	57 93%	57 93%	58 95%	61 100%	N/A	$73,312,000	$44,018,000	8	24	29

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FLORIDA, continued																		
Pensacola Naval Technical Training Center, Corry Station Previously an active airfield and training command; added cryptology, electronic warfare, and instrumentation training.	No	No	4	0	1 25%	1 25%	1 25%	2 50%	2 50%	3 75%	3 75%	4 100%	N/A	$166,000	$2,189,000	3	1	0
Pensacola Public Works Center Provides supplies, services, and public works support for fleet units and ships.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
Saufley Field Naval Air Station Provides basic training for Naval aviators; an outlying airfield for NAS Whiting Field pilot training; became Naval Education and Training Professional Development and Technology Center (NETPDTC) in 1996.	No	No	6	0	0 0%	1 17%	1 17%	2 33%	3 50%	3 50%	5 83%	6 100%	N/A	$1,909,000	$6,199,000	5	1	0
Whiting Field Naval Air Station Provides Naval aviators training in basic instruments, formation and tactic phases of fixed-wing and propeller-driven aircraft; basic and advanced helicopter training.	Yes	Yes	46	1	45 96%	45 96%	46 98%	47 100%	47 100%	47 100%	47 100%	47 100%	N/A	$36,039,000	$21,807,000	1	21	25
GEORGIA																		
Albany Marine Corps Logistics Base Acquires, maintains, repairs, rebuilds, distributes, and stores supplies and equipment to sustain combat readiness of world-wide Marine Corps forces; provides Quality Assurance Program, conducts training.	Yes	Yes	32	0	31 97%	32 100%	32 100%	32 100%	32 100%	32 100%	32 100%	32 100%	N/A	$42,597,000	$8,843,000	0	8	24
Athens Navy Supply Corps Officer School Provides basic and advanced training in supply, transportation, maintenance, and other ashore and afloat logistics services for DoD personnel and international personnel, and other functions as assigned.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$3,836,000	$0	0	1	0
Atlanta Naval and Marine Corps Reserve Readiness Center Provides training and support for Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 10%	1 100%	N/A	$245,000	$0	0	1	0
Kings Bay Naval Submarine Base Atlantic Fleet homeport of ballistic submarines, provides a full service submarine base including maintenance, repair, weapons, and crew support; supports the Navy's submarine-launched ballistic missile program.	No	Yes	17	0	17 100%	17 100%	17 100%	17 100%	17 100%	17 100%	17 100%	17 100%	N/A	$14,373,000	$1,427,000	0	14	3

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GUAM																		
Guam Commander Navy Pacific Fleet Marianas Provides administrative, personnel, and logistics support to Navy and Marine Corps in the Pacific arena.	No	No	0	1	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	2015	$383,000	$0	1	0	0
Guam Fleet and Industrial Supply Center Previously provided supplies and services for fleet units and ships.	No	Yes	6	0	5 83%	5 83%	5 83%	5 83%	6 100%	6 100%	6 100%	6 100%	N/A	$3,863,000	$2,034,000	1	2	3
Guam Naval Activities Previously provided supplies and services for fleet units and ships.	No	Yes	26	1	25 93%	25 93%	26 96%	26 96%	27 100%	27 100%	27 100%	27 100%	N/A	$30,882,000	$25,921,000	2	3	22
Guam Naval Communications Area Master Station Western Pacific Operates and maintains computer and communication facilities and equipment for Naval Shore Installations and fleet units in the eastern Pacific area.	No	Yes	9	0	8 89%	8 89%	8 89%	8 89%	8 89%	8 89%	8 89%	9 100%	N/A	$1,395,000	$10,779,000	1	0	8
Guam Naval Facility Conducts oceanographic observations in the Pacific Ocean.	No	Yes	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$803,000	$0	0	1	1
Guam Naval Regional Dental Center Previously provided general and specialized dental and clinic services.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	0	1
Guam Naval Ship Repair Facility Previously provided supplies, services, dry docking, and emergency repair for fleet ships.	No	Yes	3	0	2 67%	2 67%	2 67%	2 67%	2 67%	2 67%	2 67%	3 100%	N/A	$2,791,000	$26,784,000	1	1	1
Guam Public Works Center Previously provided public works services to fleet units and ships.	No	Yes	12	0	7 58%	7 58%	7 58%	7 58%	12 100%	12 100%	12 100%	12 100%	N/A	$64,234,000	$12,383,000	5	3	4

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HAWAII																		
Barbers Point Naval Air Station Closed; previously homeport for Navy aircraft and Coast Guard aircraft, provide air patrol, combat training, facilities, services, logistics, and supply support for aviation activities; Coast Guard Air Station operations continue..																		
	No	Yes	12	0	7 58%	7 58%	9 75%	10 83%	11 92%	11 92%	12 100%	12 100%	N/A	$7,278,000	$2,658,000	5	3	4
Barking Sands Pacific Missile Range Facility Provides integrated range services in modern, multithreat, multidimensional environment, fully instrumented missile ranges, operational and base support facilities for fleet underwater, surface, and air training exercises; Navy operational and technical Test & Evaluation.																		
	No	Yes	5	1	4 67%	4 67%	4 67%	4 67%	4 67%	4 67%	4 67%	6 100%	N/A	$5,403,000	$31,074,000	2	0	4
Camp H.M. Smith Oahu Provides administrative services, support and training for Marine Corps personnel, and is the headquarters for Commander Marine Forces Pacific.																		
	No	Yes	2	3	2 40%	2 40%	2 40%	2 40%	2 40%	2 40%	2 40%	2 40%	2018	$4,107,000	$41,000	3	2	0
Kaneohe Bay Marine Corps Base Maintains operations, training, and support facilities and provides services for the readiness and global projection of ground combat forces and aviation units operations of a Marine Corps brigade.																		
	No	Yes	26	6	15 47%	15 47%	16 50%	16 50%	17 53%	17 53%	22 69%	26 81%	2018	$2,954,000	$54,385,000	17	13	2
Lualualei Naval Magazine Receives, renovates, maintains, stores, and issues ammunition, explosives, expendable ordnance items, weapons, and technical ordnance material.																		
	No	Yes	25	10	18 51%	18 51%	19 54%	19 54%	22 63%	22 63%	22 63%	31 89%	2016	$16,002,000	$69,394,000	17	6	12
Pearl Harbor Fleet and Industrial Supply Center Provides supplies and services for fleet units and ships of the Navy, Marine Corps, Joint and Allied Forces.																		
	Yes	Yes	14	0	10 71%	10 71%	11 79%	12 86%	14 100%	14 100%	14 100%	14 100%	N/A	$34,640,000	$8,200,000	4	4	6
Pearl Harbor Inactive Ship Maintenance Detachment Provides supplies, services, dry docking, and emergency repair for fleet ships.																		
	Yes	Yes	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	0	1
Pearl Harbor Naval Shipyard Provides maintenance on submarines and surface craft, including vessel inspection, repairs, alterations, modernizations; calibration center for entire Pacific Fleet.																		
	Yes	Yes	26	0	19 73%	19 73%	19 73%	23 88%	23 88%	23 88%	23 88%	26 100%	N/A	$25,000,000	$14,780,000	7	6	13

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HAWAII, continued																		
Pearl Harbor Naval Station Provides services and materials in support of operating forces and shore activities of the Pacific Fleet.																		
	Yes	Yes	28	1	20 69%	20 69%	20 69%	20 69%	24 83%	24 83%	26 90%	29 100%	N/A	$64,662,000	$75,023,000	9	12	8
Pearl Harbor Naval Submarine Base Homeports Navy submarines, provides support services, supplies, maintenance, and repair for submarines.																		
	Yes	Yes	7	0	5 71%	5 71%	5 71%	5 71%	7 100%	7 100%	7 100%	7 100%	N/A	$7,097,000	$3,387,000	2	2	3
Pearl Harbor Public Works Center Provides facilities, engineering, and public works support for the Navy and Marine Corps, DoD, and other federal agencies.																		
	Yes	Yes	17	0	9 53%	9 53%	10 59%	10 59%	12 71%	12 71%	13 76%	17 100%	N/A	$48,571,000	$69,496,000	8	2	7
Wahiawa Naval Computer and Telecommunications Area Master Station Eastern Pacific Operates and maintains communications facilities and equipment for Naval shore installations and fleet units in the Eastern Pacific.																		
	Yes	Yes	30	0	14 47%	16 53%	16 53%	17 57%	26 87%	26 87%	29 97%	30 100%	N/A	$23,250,000	$37,999,000	16	2	12
IDAHO																		
Bayview Naval Surface Warfare Center, Acoustic Research Detachment Deep water laboratory facility for research and development projects to demonstrate submarine sonar and stealth technologies.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$257,000	$0	0	1	0
ILLINOIS																		
Great Lakes Naval Training Center Provides basic training for enlisted personnel, and initial skill, advanced, and other specialized training for Navy and Reserve officers and enlisted personnel.																		
	No	No	33	5	20 53%	22 58%	22 58%	24 63%	26 68%	27 71%	28 74%	38 100%	N/A	$15,350,000	$18,815,000	17	16	5
INDIANA																		
Crane Naval Surface Warfare Center Provides acquisition, logistics, engineering, testing and technical material to support fleet weapons and electronic surface combat systems, small arms, ordnance, microelectric technology, microwave warfare acoustical sensors, and pyrotechnics.																		
	No	Yes	35	6	17 41%	20 49%	22 54%	25 61%	28 68%	33 80%	35 85%	41 100%	N/A	$70,990,000	$26,481,000	21	11	9

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
LOUISIANA																		
New Orleans Naval Air Station Provides training and logistics support to Naval, Marine, Air Force, Louisiana Air National Guard Reserve Units and Coast Guard; now a Joint Reserve Base (JRB).	No	No	15	1	15 94%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	N/A	$3,575,000	$24,000	1	4	11
New Orleans Naval Support Activity Provides appropriate logistic support for activities and commands assigned by CNO including performing host functions for tenant commands.	No	No	5	0	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	N/A	$283,000	$0	0	5	0
MAINE																		
Brunswick Naval Air Station Provides operations for DoD's primary military air station in the Northeast U.S. in support of U.S. and allied operational forces, support services to AEGIS Destroyer shipbuilding program, and the Navy's only cold weather survival school.	Yes	Yes	15	0	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	15 100%	N/A	$64,199,000	$0	0	15	0
Cutler Naval Computer and Telecommunications Station Provides communications and electronic systems support to Fleet.	No	No	4	0	1 25%	2 50%	2 50%	2 50%	3 75%	4 100%	4 100%	4 100%	N/A	$13,849,000	$11,308,000	2	2	0
Portsmouth Naval Shipyard, Kittery Maintains, repairs, and overhauls Navy ships, including nuclear-powered vessels; research and testing of deep-diving vessels and systems.	Yes	Yes	34	1	27 77%	27 77%	27 77%	28 80%	31 89%	32 91%	34 97%	35 100%	N/A	$53,216,000	$29,738,000	7	28	0
MARYLAND																		
Annapolis Naval Station Provides general support for training of Naval Academy Midshipmen, including underway seamanship and sail training, navigation, and small arms weapons; and other support as assigned.	No	No	2	0	1 50%	1 50%	1 50%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$4,586,000	$4,347,000	1	1	0
Annapolis U.S. Naval Academy Provides educational, social, moral, physical, and military training for Navy Midshipmen with graduates prepared for a Naval service career.	No	No	8	0	7 88%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	N/A	$3,640,000	$286,000	0	8	0
Bainbridge Naval Training Center Closed since 1976; provided military training in firefighting, nuclear power (classroom only), radioman school, also served as recruit training, Naval Academy Preparatory School, Women Accepted for Volunteer Emergency Service (WAVES), and Naval Reserve Center.	No	No	5	0	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	N/A	$24,482,000	$392,000	0	3	2

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MARYLAND, continued																		
Baltimore Naval Reserve Center Maintains, trains, and mobilizes 20 assigned Reserve Units attached to the Readiness Center; COMNAVDIST WASHINGTON representative for casualty assistance calls for Baltimore port ship visit coordination.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$126,000	$0	0	1	0
Bethesda Naval Medical Command National Capital Region Provides health care services throughout the assigned geographical and mission-identified areas of responsibility and acts as the central authority for cooperation with military and civilian authorities for public health, disasters, and other emergencies.																		
	No	No	8	0	7 88%	7 88%	7 88%	8 100%	8 100%	8 100%	8 100%	8 100%	N/A	$3,458,000	$1,486,000	1	7	0
Carderock Naval Surface Warfare Center Performs Research, Development, Testing and Evaluation (RDT&E) in naval architecture, marine engineering, ship concepts, vehicle technology and survivability under the effect of weapons; fleet support, and in-service engineering for surface and undersea vehicle systems.																		
	No	Yes	9	5	14 100%	14 100%	14 100%	14 100%	14 100%	14 100%	14 100%	14 100%	N/A	$10,733,000	$0	0	0	14
Cheltenham Naval Computer and Telecommunications Center Manages, operates, and maintains facilities of the Defense Communications System.																		
	No	No	4	0	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	N/A	$1,040,000	$0	0	4	0
Chesapeake Bay Detachment Naval Research Laboratory Testing and developing of radar, radio, optical, and fire control equipment.																		
	No	No	8	3	8 73%	9 82%	9 82%	11 100%	11 100%	11 100%	11 100%	11 100%	N/A	$1,699,000	$87,000	3	8	0
Indian Head Naval Surface Warfare Center Conducts research, development, and production of rocket and torpedo propellants and explosives; including energetics research, weapons development, strategic systems, detonation science, underwater warheads, chemical processing, high-energy propellants, extruded products, cartridge/propellant-actuated devices, ordnance test and evaluation, weapon simulation.																		
	Yes	Yes	68	32	55 55%	57 57%	65 65%	74 74%	76 76%	80 80%	87 87%	89 89%	2016	$43,678,000	$62,669,000	38	16	46
Patuxent River Naval Air Station Maintains and operates facilities and provides services and materials to support operations of the Naval Air Warfare Center Aircraft Division and other activities and units; supports testing and evaluating Naval aircraft systems.																		
	Yes	Yes	62	0	47 76%	50 81%	51 82%	55 89%	57 92%	60 97%	62 100%	62 100%	N/A	$55,323,000	$29,439,000	12	17	33
Pomonkey Test Range Naval Research Laboratory Conducts multidisciplinary scientific research and advanced technological development for maritime applications of new and improved materials, techniques, equipment, system, and ocean, atmospheric, and space sciences and related technologies; tracks and analyzes satellite telemetry data.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$52,000	$0	0	1	0

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MARYLAND, continued																		
Solomons Naval Recreation Center Provides recreational services to military and civilian personnel.	No	No	1	5	3 50%	3 50%	6 100%	6 100%	6 100%	6 100%	6 100%	6 100%	N/A	$3,455,000	$10,000	3	2	1
St. Inigoes Naval Command Control and Ocean Surveillance Center In-Service Engineering – East Coast Detachment Provides electronics material support of systems and equipment.	No	No	2	0	1 50%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$2,026,000	$0	1	1	0
Waldorf Naval Research Laboratory Conducts microwave space research; stores equipment and supplies.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$1,582,000	$0	0	1	0
MASSACHUSETTS																		
Bedford Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) facility whose mission is to design, fabricate, and test prototype weapons equipment such as missile guidance and control systems.	Yes	Yes	4	0	2 50%	2 50%	2 50%	2 50%	3 75%	3 75%	4 100%	4 100%	N/A	$21,709,000	$35,964,000	2	2	0
Quincy Naval Reserve Center Provides training and administrative support for Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$212,000	$0	0	1	0
MINNESOTA																		
Fridley Naval Industrial Reserve Ordnance Plant Government-Owned Contractor-Operated (GOCO) facility designs and manufactures advanced weapons systems.	Yes	Yes	5	0	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	N/A	$36,722,000	$8,519,000	0	5	0
St. Paul Naval Industrial Reserve Ordnance Plant Government-Owned Contractor-Operated (GOCO) facility provides computer combat systems testing and support.	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$0	$0	0	2	0

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MISSISSIPPI																		
Gulfport Naval Construction Battalion Center Provides construction force support and training of construction battalion personnel; homeport, mobilization base, and logistics support center for the Atlantic Fleet "Sea-Bees" Construction Battalion.	No	Yes	10	0	2 20%	3 30%	6 60%	8 80%	9 90%	9 90%	9 90%	10 100%	N/A	$18,028,000	$10,842,000	5	4	1
Meridian Naval Air Station Maintains and operates facilities and provides material to support operations of aviation activities.	No	No	7	0	5 71%	5 71%	7 100%	7 100%	7 100%	7 100%	7 100%	7 100%	N/A	$8,701,000	$472,000	2	4	1
MISSOURI																		
Kansas City Marine Corps Regional Contracting Office Provides contracting support for Marine Corps forces.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$42,000	$410,000	0	1	0
MONTANA																		
Butte Naval Reserve Facility Provides training and administration support and mobilizes Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
NEBRASKA																		
Lincoln Naval Reserve Center Provides training, administration, and mobilization for Naval Reserve Units; currently inactive.	No	Yes	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$195,000	$0	0	2	0
NEVADA																		
Fallon Naval Air Station Provides integrated air warfare training, including air to ground bombing, rocket strafing and electronic warfare, to carrier air wings, Marine air groups, tenant commands, and individual units; upgrades and maintains the Fallon range complex, the airfield, aviation support facilities.	No	Yes	29	0	23 79%	25 86%	26 90%	27 93%	29 100%	29 100%	29 100%	29 100%	N/A	$26,870,000	$8,124,000	2	7	20
NEW JERSEY																		
Earle Naval Weapons Station Provides handling, storage, renovations, and transshipment of munitions. Formerly listed as Colts Neck Naval Weapons Station Earle.	Yes	Yes	69	1	68 97%	69 99%	70 100%	70 100%	70 100%	70 100%	70 100%	70 100%	N/A	$28,645,000	$8,438,000	0	70	0

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NEW JERSEY, continued																		
Lakehurst Naval Air Warfare Center Aircraft Division Technology development, engineering, developmental evaluation and verification, systems integration, manufacturing, procurement, integrated logistics support management, and fleet engineering support for Aircraft Platform Interface Systems.	Yes	Yes	45	6	46 90%	46 90%	46 90%	48 94%	48 94%	48 94%	50 98%	50 98%	2018	$58,383,000	$59,942,000	5	46	0
NEW YORK																		
Bethpage Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) production facility develops and produces military weapons.	No	Yes	4	0	2 50%	3 75%	3 75%	3 75%	3 75%	3 75%	4 100%	4 100%	N/A	$32,778,000	$26,962,000	1	3	0
Binghamton Naval Reserve Center Formerly provided administrative and training facilities for Naval Reserve Units; currently unoccupied.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$1,328,000	$0	0	1	0
Calverton Naval Weapons Industrial Reserve Plant Closed; previously a Government-Owned, Contractor-Operated (GOCO) facility for the manufacture, assembly, and testing of aircraft and aircraft components.	No	Yes	13	0	10 77%	10 77%	11 85%	12 92%	12 92%	12 92%	12 92%	13 100%	N/A	$24,256,000	$20,971,000	3	10	0
Fishers Island Naval Underwater Systems Center Annex Provides Research, Development, Test and Evaluation (RDT&E) center for underwater surveillance, communications, and navigation systems.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$200,000	$0	0	1	0
Floyd Bennett Field Naval and Marine Corps Reserve Center Provides training and administrative support to Navy, Marine Corps, and Army Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
Syracuse Marine Corps Reserve Training Center Provides training and administrative support and mobilizes Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	13 100%	1 100%	1 100%	1 100%	1 100%	N/A	$222,000	$0	0	1	0
Watertown Naval Reserve Center Provides training and administrative support for Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$91,000	$0	0	1	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
NORTH CAROLINA																		
Camp Lejeune Marine Corps Base Provides training facilities, logistical and administrative support, and certain administrative supplies for Fleet Marine Corps Units and other assigned units; conducts specialized training in combat, amphibious, urban, riverine, and special operations, and international training exercises.	Yes	Yes	177	14	170 89%	171 90%	172 90%	174 91%	175 92%	177 93%	177 93%	177 93%	2017	$152,681,000	$137,219,000	19	172	0
Cherry Point Marine Corps Air Station Maintains and operates support facility and provides services and materials for Marine Corps aircraft wing.	Yes	Yes	97	3	94 94%	95 95%	95 95%	97 97%	97 197%	97 97%	97 97%	97 97%	2017	$83,094,000	$87,047,000	6	90	4
Wilmington Naval Reserve Center Provides training support for administrative, logistics, and mobilization of Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$61,000	$0	0	1	0
OHIO																		
Toledo Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) production facility providing research and development, design engineering, and testing of advanced weapons systems.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$1,327,000	$0	0	1	0
OKLAHOMA																		
Broken Arrow Naval and Marine Corps Reserve Center Provides training and reserve center support to the Navy, Marine Corps, and Army Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$69,000	$0	0	1	0
OREGON																		
Coos Bay Naval Ocean Processing Facility Processing facility.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$311,000	$0	0	1	0
Portland Naval and Marine Corps Reserve Readiness Center Provides training, education, and administration support and mobilizes Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$103,000	$0	0	1	0
Salem Naval and Marine Corps Reserve Center Provides training and administrative support to Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
PENNSYLVANIA																		
Mechanicsburg Naval Inventory Control Point Provides logistics support to the Navy Fleet, inventory management of parts for ships, submarines, aircraft, and weapons systems.	Yes	Yes	15	1	12 75%	13 81%	13 81%	13 81%	15 94%	15 94%	15 94%	16 100%	N/A	$32,006,000	$14,084,000	4	1	11
Philadelphia Naval Aviation Supply Office Provides program and supply support for Naval weapons systems, aircraft, and fleet activities.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$790,000	$194,000	0	1	0
Philadelphia Naval Surface Warfare Center, Carderock Division Ensures operational readiness of U.S. and Allied Forces by providing full spectrum technical capabilities necessary to rapidly transition and Energetics product from concept through product to operational employment.	No	Yes	10	0	9 90%	9 90%	9 90%	9 90%	10 100%	10 100%	10 100%	10 100%	N/A	$16,656,000	$800,000	0	9	1
Willow Grove Naval Air Station Provides training for aviation activities; runway shared by Navy, Marine Corps, Air Force, and Army Reservists, Pennsylvania Air National Guard; training with the latest warfare technologies, Reservists are tasked with missions and operate in direct support of their active duty fleet counterparts to meet any national contingency.	Yes	Yes	9	0	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	N/A	$7,777,000	$0	0	9	0
Wyoming Marine Corps Reserve Center Provides training and support to Marine Corps Reserve Units, and maintains heavy equipment.	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$0	$0	0	2	0
PUERTO RICO																		
Roosevelt Roads Camp Garcia Marine Corps Training Facility Former Roosevelt Roads Camp Garcia previously supported the Air to Ground, and Sea to Ground combat training for Navy and Marine Corps exercises at Atlantic Fleet Weapons Training Facility.	Yes	Yes	12	0	0 0%	0 0%	6 50%	9 75%	11 92%	11 92%	11 92%	12 100%	N/A	$3,717,000	$14,668,000	11	1	0
Roosevelt Roads Naval Station Provides full support for Atlantic Fleet Weapons training and development activities.	No	Yes	59	1	60 100%	60 100%	60 100%	60 100%	60 100%	60 100%	60 100%	60 100%	N/A	$22,459,000	$0	0	60	0
Sabana Seca Naval Security Group Activity Operates high frequency direction finding facility, provides communications and related services, and manpower assistance to Department of the Navy and other DoD missions.	No	Yes	8	0	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	8 100%	N/A	$3,470,000	$0	0	8	0

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PUERTO RICO, continued																		
San Juan Puerto Rico Supervisor of Shipbuilding Former base for support of Naval Aircraft and Operations in Caribbean, now leased to Puerto Rico government, and Puerto Rico Dry Dock and Marine terminal; vessel servicing and repair.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$0	$0	0	3	0
Vieques East Former Vieques Naval Training Range (VNTR)/Atlantic Fleet Weapons Training Facility (AFWTF) use for combat readiness training including air-to-ground, ship-to-shore, small arms, artillery, ground, and amphibious weapons.																		
	Yes	Yes	0	1	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	2018	$53,738,000	$251,078,000	1	0	0
Vieques West Former Vieques Naval Ammunition Support Detachment previously was used as an ammunition storage facility supporting the Atlantic Fleet Weapons Training Facility on the eastern end of Vieques.																		
	Yes	Yes	16	1	10 59%	14 82%	15 88%	15 88%	15 88%	16 94%	16 94%	16 94%	2016	$17,096,000	$11,258,000	6	11	0
RHODE ISLAND																		
Newport Naval Education and Training Center Provides training and logistics; prepares military, civilian, and international military members to successfully carry out their duties with or in support of combat ready Naval forces.																		
	Yes	Yes	29	2	17 55%	17 55%	18 58%	19 61%	19 61%	20 65%	27 87%	31 100%	N/A	$96,410,000	$45,565,000	14	10	7
SOUTH CAROLINA																		
Beaufort Marine Corps Air Station Provides fighter-aircraft assets, aircraft operations, logistics, and administrative support to the Fleet, Marine Corps, and tenant units.																		
	No	No	44	5	36 73%	37 76%	39 80%	43 88%	44 90%	45 92%	45 92%	46 94%	2015	$10,081,000	$13,269,000	12	15	22
Charleston Naval Weapons Station Provides assigned weapons and weapons systems; supports fleet and shore activities with guided missiles, conventional ammunition, torpedoes, and other underwater weapons.																		
	No	No	68	7	51 68%	51 68%	53 71%	55 73%	59 79%	64 85%	68 91%	75 100%	N/A	$33,275,000	$35,615,000	24	15	36
Parris Island Marine Corps Recruit Depot Provides basic and combat training of enlisted personnel upon their first entry into the Marine Corps.																		
	Yes	Yes	25	8	16 48%	17 52%	18 55%	23 70%	25 76%	26 79%	26 79%	27 82%	2016	$20,292,000	$17,498,000	16	6	11

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TENNESSEE																		
Bristol Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) production facility providing research and development, design engineering, and testing of advanced weapons systems.	No	No	9	0	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	9 100%	N/A	$11,005,000	$118,000	0	5	4
Knoxville Naval and Marine Corps Reserve Center Provides training support for administrative, logistics, and mobilization of Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$833,000	$0	0	1	0
Mid-South Naval Support Activity Maintains and operates facilities and provides services and material to support operations of aviation activities. Formerly Memphis Naval Air Station, it was realigned under BRAC 1993.	No	Yes	42	1	42 98%	42 98%	42 98%	42 98%	42 98%	42 98%	42 98%	43 100%	N/A	$11,801,000	$6,737,000	1	42	0
TEXAS																		
Corpus Christi Naval Air Station Provides pilot training; provides facilities operation, maintenance, and logistical support of aviation activities.	No	No	21	3	21 88%	21 88%	21 88%	22 92%	22 92%	22 92%	23 96%	24 100%	N/A	$11,704,000	$5,898,000	3	8	13
Dallas Naval Weapons Industrial Reserve Plant Government-Owned, Contractor-Operated (GOCO) facility, produces Naval weapons systems; provides and maintains a reserve industrial facility.	No	Yes	23	0	21 91%	21 91%	22 96%	22 96%	22 96%	22 96%	22 96%	23 100%	N/A	$32,690,000	$32,513,000	0	14	9
Kingsville Naval Air Station Maintains and operates aviation and bombing range facilities and provides services and materials to support operations of aviation activities; trains tactical jet pilots for the Navy and Marine Corps.	No	No	20	0	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	N/A	$9,012,000	$3,147,000	0	15	5
Lubbock Naval and Marine Corps Reserve Center Provides training and support services for Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$101,000	$0	0	1	0
McGregor Naval Weapons Industrial Reserve Plant Government-Owned Contractor-Operated (GOCO) facility operated by Hercules, Inc., formerly operated as aircraft bomb loading plant which produced solid propellant rocket motors.	No	Yes	19	0	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	N/A	$46,390,000	$16,800,000	0	7	12

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UTAH																		
Magna Naval Industrial Reserve Ordnance Plant Government-Owned Contractor-Operated (GOCO) facility operated by Hercules, Inc., for production of rocket motors.																		
	No	No	16	0	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	16 100%	N/A	$0	$0	0	0	16
VIRGINIA																		
Arlington Headquarters Battalion Provides administrative, personnel, and logistics support to active and retired Marine Corps personnel.																		
	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$44,000	$0	0	1	0
Arlington Service Center Provides DoD communications support.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$2,100,000	$0	0	3	0
Chesapeake Naval Security Group Activity Northwest Disestablished on 01 October 2001; provided communications and intelligence support to the Atlantic Fleet.																		
	No	No	4	1	4 80%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	5 100%	N/A	$2,551,000	$285,000	1	4	0
Craney Island Fleet and Industrial Supply Center Operates and maintains a primary fuel terminal; receives, stores, and issues fuels.																		
	No	Yes	20	0	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	20 100%	N/A	$22,623,000	$1,896,000	0	16	4
Dahlgren Naval Surface Warfare Center Provides research, development, test and evaluation, engineering, and fleet support for surface warfare; surface ship combat systems; ordnance; strategic systems; mines; amphibious warfare systems; mine countermeasures; special warfare systems; proof and test weapons.																		
	Yes	Yes	68	0	62 91%	65 96%	67 99%	68 100%	68 100%	68 100%	68 100%	68 100%	N/A	$63,446,000	$8,793,000	5	35	28
Dam Neck Fleet Combat Training Center Atlantic Provides training in operation, maintenance, and employment of specified tactical combat direction and control systems typical to naval warfare; and facilities, logistical, maintenance, and personnel support to tenant commands.																		
	No	Yes	11	0	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	N/A	$754,000	$0	0	9	2
Little Creek Naval Amphibious Base Provides support and services to operating forces and shore commands, including amphibious warfare support; on-base logistics facilities and related support facilities.																		
	Yes	Yes	39	1	34 85%	35 88%	37 93%	37 93%	39 98%	39 98%	40 100%	40 100%	N/A	$29,328,000	$26,342,000	4	22	14

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VIRGINIA, continued																		
Norfolk Naval Base Principal operating base of U.S. Atlantic Fleet; headquarters; docks; Fleet and Industrial Supply Center, Naval Aviation Depot, Naval Air Station, Naval Station and Public Works Center.	Yes	Yes	62	0	59 95%	60 97%	62 100%	62 100%	62 100%	62 100%	62 100%	62 100%	N/A	$96,495,000	$18,907,000	0	52	10
Norfolk Naval Shipyard Provides logistic support for ships, submarines, and service craft; performs construction, dry docking, conversion, overhaul, repair, alteration, modernization, and outfitting of vessels; research, development, test and evaluation of shipboard systems.	Yes	Yes	31	0	30 97%	30 97%	30 97%	30 97%	31 100%	31 100%	31 100%	31 100%	N/A	$28,549,000	$9,608,000	1	13	17
Oceana Naval Air Station Maintains and operates facilities and provides services and materials to support Naval aviation year-round as a master jet base; provides support to Pacific and Atlantic Aircraft Carriers, Search and Rescue, and other agencies.	No	Yes	39	1	39 98%	39 98%	39 98%	39 98%	39 98%	39 98%	40 100%	40 100%	N/A	$20,416,000	$7,676,000	1	27	12
Portsmouth Naval Medical Command Provides general and clinical hospitalization services for active duty Navy and Marine Corps personnel.	No	No	2	0	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	2 100%	N/A	$42,000	$0	0	2	0
Quantico Marine Corps Base Supports research, development, testing and evaluation of military hardware and military training.	Yes	No	102	23	98 78%	100 80%	108 86%	110 88%	111 89%	112 90%	112 90%	113 90%	2017	$61,870,000	$37,742,000	25	10	90
St. Juliens Creek Annex Provides supplies, equipment, and support services to fleet activities.	Yes	Yes	15	0	12 80%	13 87%	13 87%	13 87%	14 93%	14 93%	14 93%	15 100%	N/A	$16,059,000	$17,135,000	3	11	1
Yorktown Fleet and Industrial Supply Center Fuels Division Transfers and stores fuel oils.	No	No	21	0	21 100%	21 100%	21 100%	21 100%	21 100%	21 100%	21 100%	21 100%	N/A	$37,873,000	$12,125,000	0	21	0
Yorktown Naval Weapons Station Provides ordnance logistics, maintenance, modifications, production, loading/off-loading and storage for Atlantic Fleet.	Yes	Yes	48	1	41 84%	41 84%	41 84%	46 94%	48 98%	48 98%	48 98%	48 98%	2015	$53,503,000	$20,133,000	7	33	9

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VIRGINIA, continued																		
Yorktown Naval Weapons Station Cheatham Annex Receiving, storing, packaging, and shipping of materials to federal facilities on the East Coast and major distribution centers in Europe; previously Williamsburg Fleet Industrial Supply Center Cheatham Annex.	Yes	Yes	17	1	7 39%	8 44%	9 50%	11 61%	14 78%	15 83%	16 89%	17 94%	2015	$9,461,000	$19,168,000	10	2	6
WASHINGTON																		
Bangor Naval Submarine Base Provides support base for Trident submarines; Trident launched ballistic missile system; administration, logistics, and personnel support services.	Yes	Yes	42	1	42 98%	42 98%	42 98%	43 100%	43 100%	43 100%	43 100%	43 100%	N/A	$87,698,000	$34,724,000	0	43	0
Everett Naval Reserve Center Provides training and administrative support and mobilizes Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$310,000	$0	0	1	0
Indian Island Naval Magazine Receives, stores, maintains, and issues ordnance. Formerly listed as Port Hadlock Naval Ordnance Center Pacific Division Detachment.	No	Yes	18	1	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	19 100%	N/A	$9,275,000	$232,000	0	9	10
Jim Creek Naval Radio Station Manages, operates, and maintains a very low frequency (VLF) radio transmitting system, an electronic courier circuit for the receipt and delivery of messages and maintains the associated control circuits.	No	No	10	1	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	11 100%	N/A	$900,000	$0	0	9	2
Keyport Naval Undersea Warfare Center Originally tested torpedoes; now provides test and evaluation; in-service engineering, maintenance, and repair; Fleet readiness, and industrial-base support for undersea warfare systems, countermeasures, and sonar systems.	Yes	Yes	13	0	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	13 100%	N/A	$33,628,000	$9,726,000	0	10	3
Puget Sound Fleet and Industrial Supply Center Bremerton Procures equipment and services for Naval activities.	Yes	Yes	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$21,150,000	$2,799,000	0	1	0

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%) 2007	2008	2009	2010	2011	2012	2013	2014	Future MRP RIP/RC	Funding to Date	Cost to Complete	Phase Study	Cleanup	RC
WASHINGTON, continued																		
Pugent Sound Fleet and Industrial Supply Center Manchester Provides bulk fuel and lubricant support to fleet and shore activities, and other Puget Sound Area U.S. military activities.	No	No	4	0	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	N/A	$526,000	$0	0	3	1
Puget Sound Naval Hospital Bremerton Provides clinic and hospital services for active duty Navy and Marine Corps personnel; originally used for ammunition storage and ordnance demilitarization.	Yes	Yes	1	1	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	1 50%	2 100%	N/A	$3,882,000	$6,021,000	1	1	0
Puget Sound Naval Shipyard Provides logistic support for assigned ships and service craft; performs construction, overhaul, and repair on all Navy vessels; ship recycling; homeports nuclear aircraft carrier, cruisers, and fleet support ships.	Yes	Yes	34	2	32 89%	32 89%	32 89%	32 89%	32 89%	33 92%	33 92%	36 100%	N/A	$162,928,000	$78,842,000	3	33	0
Puget Sound Naval Station Everett Maintains and operates facilities and provides essential maintenance, operational, and material support to a seven-ship carrier battle group, operating forces and tenant activities.	No	No	4	0	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	4 100%	N/A	$1,036,000	$0	0	4	0
Seattle Naval Reserve Readiness Center Provides training and administrative support for Navy Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$887,000	$0	0	1	0
Spokane Naval and Marine Corps Reserve Center Provides training, administrative, and mobilization support for Navy and Marine Corps Reserves.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
Tacoma Naval and Marine Corps Reserve Center Provides training, education, and administrative support and mobilizes Navy and Marine Corps Reserve Units.	No	No	1	0	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	N/A	$0	$0	0	1	0
Whidbey Island Naval Air Station Provides facilities, services, training, and operations to the Naval aviation community and all organizations utilizing the Naval Air Station on Whidbey Island; serves as center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest.	Yes	Yes	91	4	91 96%	91 96%	91 96%	91 96%	91 96%	94 99%	95 100%	95 100%	N/A	$95,186,000	$37,066,000	4	85	6

	NPL	RAB	IRP	MRP	Sites with Remedy in Place or Response Complete #(%)								Future MRP	Funding to Date	Cost to Complete	Phase		
					2007	2008	2009	2010	2011	2012	2013	2014	RIP/RC			Study	Cleanup	RC
WEST VIRGINIA																		
Allegany Ballistics Laboratory Government-Owned, Contractor-Operated (GOCO) research, development, testing, and production facility for solid propellants and rocket motors for DoD and NASA; communications and armaments for the Navy.																		
	Yes	Yes	41	0	34 83%	35 85%	37 90%	38 93%	40 98%	40 98%	40 98%	41 100%	N/A	$34,042,000	$34,605,000	7	13	21
Sugar Grove Naval Security Group Activity Provides communications support for operations in the Atlantic Ocean.																		
	No	No	3	0	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	3 100%	N/A	$0	$0	0	3	0

E APPENDIX E – Installations With Assessment Complete and No Sites Identified

CALIFORNIA
Chollas Heights Radio Transmitter
Imperial Beach Singer Education Division
San Diego Naval Undersea Warfare Engineering Station, Southern California Detachment
Tupman Naval Petroleum Reserve Number 1

COLORADO
Anvil Points Facility, Naval Petroleum Reserve

CONNECTICUT
New London Naval Underwater Systems Center

DELAWARE
Lewes Naval Reserve Facility

DISTRICT OF COLUMBIA
Washington DC Naval Air Facility

FLORIDA
Fort Lauderdale Naval Underwater Systems Center
Homestead Naval Security Group Activity
Richmond Naval Air Station
West Palm Beach Naval Underwater Systems Center

GUAM
Guam Navy Publishing and Printing Services Office

HAWAII
Pearl Harbor Fleet Training Group Activity

INDIANA
Gary Naval and Marine Corps Reserve Center

MAINE
Corea Naval Security Group Activity
Winter Harbor Naval Security Group Activity

MARYLAND
Bloodsworth Archipelago Bombardment Range
Suitland Naval Technical Intelligence Center

MASSACHUSETTS
Boston Naval Shipyard
Pittsfield Naval Industrial Reserve Ordnance Plant

MINNESOTA
Rosemount Navy Astronautics Group Detachment Bravo

APPENDIX E, continued

MISSOURI

St. Louis Naval and Marine Corps Reserve Center
St. Louis Naval Plant Representative Office

NEBRASKA

Omaha Naval and Marine Corps Reserve Center

NEW YORK

Fort Schuyler Naval and Marine Corps Reserve Center
Glens Falls Naval Reserve Center
New York Naval Station Stapleton
Rochester Naval Industrial Reserve Ordnance Plant
Scotia Naval Administration Unit

PUERTO RICO

Roosevelt Roads Naval Radio Transmitting Facility, Isabella

RHODE ISLAND

Charlestown Naval Air Station
Providence Armed Forces Reserve Center
Quonset Point Naval Air Station

VIRGINIA

Alexandria Naval Facilities Engineering Command
Norfolk Atlantic Division Naval Facilities Engineering Command
Roanoke Naval and Marine Corps Reserve Center
Williamsburg Armed Forces Experimental Training Activity, Camp Peary

F APPENDIX F – Installations With All Completed Actions at All IRP Sites*

ALASKA
Amchitka Fleet Surveillance Support Command Detachment 1
Cape Prince of Wales Naval Command Control and Ocean Surveillance Center
Point Barrow Naval Arctic Research Laboratory
St. Lawrence Naval Command Control and Ocean Surveillance Center
Tin City Naval Command Control and Ocean Surveillance Center

ARIZONA
Flagstaff Naval Observatory Station
Sentinel Naval Command Control and Ocean Surveillance Center
Yuma Marine Corps Air Station

CALIFORNIA
Bridgeport Marine Corps Mountain Warfare Training Center
Centerville Beach Naval Facility
Chocolate Mountain Aerial Gunnery Range
Corona Naval Ordnance Center Naval Warfare Assessment Division
Daly City Engineering Field Activity West
Dixon Naval Radio Transmitting Facility
Monterey Naval Post Graduate School
North Island Naval Aviation Depot
Pasadena Marine Corps Reserve Center
Pico Rivera Marine Corps Reserve Training Center
Point Sur Naval Facility
Pomona Naval Industrial Reserve Ordnance Plant
San Diego Fleet Antisubmarine Warfare Training Center Pacific
San Diego Fleet Combat Training Center Pacific
San Diego Marine Corps Recruit Depot
San Diego Naval Computer and Telecommunications Station
San Diego Naval Medical Center
San Diego Naval Training Center
San Diego Space Surveillance Field Station
San Nicolas Island, Outlying Landing Field
Stockton Naval Communication Station
Sunnyvale Naval Industrial Reserve Ordnance Plant
Warner Springs Survival, Evasion, Resistance and Escape Camp

COLORADO
Lowry Air Force Base Armed Forces Air Intelligence Training Center

CONNECTICUT
New London Naval Underwater Warfare Center Detachment

DISTRICT OF COLUMBIA
Washington Naval Observatory
Washington Naval Research Laboratory
Washington Naval Security Station

APPENDIX F, continued

FLORIDA
Jacksonville Fleet and Industrial Supply Center
Key West Naval Air Station
Panama City Coastal Systems Station
Pensacola Public Works Center

GEORGIA
Athens Navy Supply Corps Officer School
Atlanta Naval and Marine Corps Reserve Readiness Center
Kings Bay Naval Submarine Base

GUAM
Guam Naval Facility
Guam Naval Regional Dental Center

HAWAII
Camp H.M. Smith Oahu
Pearl Harbor Inactive Ship Maintenance Detachment

IDAHO
Bayview Naval Surface Warfare Center, Acoustic Research Detachment

LOUISIANA
New Orleans Naval Air Station
New Orleans Naval Support Activity

MAINE
Brunswick Naval Air Station

MARYLAND
Bainbridge Naval Training Center
Baltimore Naval Reserve Center
Carderock Naval Surface Warfare Center
Cheltenham Naval Computer and Telecommunications Center
Chesapeake Bay Detachment Naval Research Laboratory
Pomonkey Test Range Naval Research Laboratory
Solomons Naval Recreation Center
Waldorf Naval Research Laboratory

MASSACHUSETTS
Quincy Naval Reserve Center

MINNESOTA
Fridley Naval Industrial Reserve Ordnance Plant
St. Paul Naval Industrial Reserve Ordnance Plant

MISSOURI
Kansas City Marine Corps Regional Contracting Office

MONTANA
Butte Naval Reserve Facility

NEBRASKA
Lincoln Naval Reserve Center

APPENDIX F, continued

NEW JERSEY
Lakehurst Naval Air Warfare Center Aircraft Division

NEW YORK
Binghamton Naval Reserve Center
Fishers Island Naval Underwater Systems Center Annex
Floyd Bennett Field Naval and Marine Corps Reserve Center
Syracuse Marine Corps Reserve Training Center
Watertown Naval Reserve Center

NORTH CAROLINA
Wilmington Naval Reserve Center

OHIO
Toledo Naval Weapons Industrial Reserve Plant

OKLAHOMA
Broken Arrow Naval and Marine Corps Reserve Center

OREGON
Coos Bay Naval Ocean Processing Facility
Portland Naval and Marine Corps Reserve Readiness Center
Salem Naval and Marine Corps Reserve Center

PENNSYLVANIA
Philadelphia Naval Aviation Supply Office
Willow Grove Naval Air Station
Wyoming Marine Corps Reserve Center

PUERTO RICO
Roosevelt Roads Naval Station
Sabana Seca Naval Security Group Activity
San Juan Puerto Rico Supervisor of Shipbuilding

TENNESSEE
Bristol Naval Weapons Industrial Reserve Plant
Knoxville Naval and Marine Corps Reserve Center
Mid-South Naval Support Activity

TEXAS
Corpus Christi Naval Air Station
Kingsville Naval Air Station
Lubbock Naval and Marine Corps Reserve Center
McGregor Naval Weapons Industrial Reserve Plant

UTAH
Magna Naval Industrial Reserve Ordnance Plant

VIRGINIA
Arlington Headquarters Battalion
Arlington Service Center
Chesapeake Naval Security Group Activity Northwest
Craney Island Fleet and Industrial Supply Center
Dam Neck Fleet Combat Training Center Atlantic
Oceana Naval Air Station
Portsmouth Naval Medical Command
Yorktown Fleet and Industrial Supply Center Fuels Division

APPENDIX F, continued

WASHINGTON

Bangor Naval Submarine Base
Everett Naval Reserve Center
Indian Island Naval Magazine
Jim Creek Naval Radio Station
Keyport Naval Undersea Warfare Center
Puget Sound Fleet and Industrial Supply Center Bremerton
Puget Sound Fleet and Industrial Supply Center Manchester
Puget Sound Naval Hospital Bremerton
Puget Sound Naval Station Everett
Seattle Naval Reserve Readiness Center
Spokane Naval and Marine Corps Reserve Center
Tacoma Naval and Marine Corps Reserve Center
Whidbey Island Naval Air Station

WEST VIRGINIA

Sugar Grove Naval Security Group Activity

* All IRP sites at these installations have achieved RIP/RC status.

Chief of Naval Operations

Environmental Readiness Division