WINTER 2012

NESDI NEWS

Highlights & Happenings

Welcome

This quarterly update provides a glimpse into program operations, significant accomplishments, and future focus areas for the Navy Environmental Sustainability Development to Integration (NESDI) program.

We hope you will find these insights useful and that they encourage you to participate (or increase your involvement) in the program over the coming months.

The NESDI Program: Integrating Green Technologies Into the Fleet

From the **Program Manager's Desk**

Welcome to the Winter 2012 issue of *NESDI News: Highlights & Happenings*—part of our ongoing effort to keep you informed about the NESDI program.

The next significant milestone on the NESDI program schedule is the submission of full proposals. The program has already collected pre-proposals to address 19 highly ranked needs collected during our FY12 solicitation. Of the 25 pre-proposals that were received, we are asking for more detailed, full proposals to address the fourteen projects listed on the following page.

Personnel from the responsible commands listed are invited to develop and submit a full technical proposal which should include the following components:

- A detailed description of the need
- Proposed solution(s)
- Technical approach and objectives
- Success criteria
- User endorsement of the project
- Stakeholder endorsement of the project
- Approval authority endorsement of the project
- Potential benefits
- Scheduled tasks and milestones
- Anticipated products
- A transition strategy
- A proposed budget

The full proposal will define quantifiable performance metrics to evaluate the ultimate success of the project and present baseline data for later comparison to post-integration conditions.

Leslie A. Karr

Leslie Karr, P.E.
NESDI Program Manager

For more information about submitting a full proposal, download the Full Proposal Submission Template (FullProposalTemplate.doc) available from the "Downloads" section on our web site, contact your Technology Development Working Group (TDWG) representative, or read the "Using Our Web Site" section in this issue of *NESDI News.*

No.	Pre-Proposal ID	Need to be Addressed	Pre-Proposal Title	Responsible Command
1.	128	N-0799-12: Emerging Drinking Water Constituents of Concerns and Marginal Drinking Water Quality at Navy Bases	Use of Boron-Doped Diamond Electrodes for Water Treatment	NAVFAC
2.	130	N-0814-12: Non-Hazardous Solid Waste Diversion	Improving Non-Hazardous Solid Waste Diversion	NAVFAC
3.	132	N-0802-12: Demonstrate and Validate Alternatives to Methylene Chloride-based Chemical Paint Stripper	Demonstrate/Validate Alternatives to Methylene Chloride-based Chemical Paint Strippers	NAVAIR
4.	134	N-0827-12: The Effects of Copper on the Behavior of Estuarine Fishes for Effective Management of Sensitive Coastal Species	Application of the Marine Biotic Ligand Model for Copper to Evaluate Risks Associated with Olfactory Responses in Salmonids and Forage Fish	SPAWAR
5.	137	N-0824-12: Air Emissions Guidance Tool	Air Emissions Guidance Tool	NAVFAC
6.	138	N-0828-12: Improve Oily Water Treatment System (OWTS) processes for compliance with National Pollutant Discharge Elimination System (NPDES) Permit's Discharge Standards	Remove Copper and Other Heavy Metals from OWTS Discharge for Compliance with NPDES Discharge Standards	NAVFAC
7.	139	N-0826-12: Non-explosive Venting of Full Scale Non-explosive Practice Munitions	Bandsaw Cutting to Vent Full Scale Non-Explosive	NAVFAC
8.	140	N-0840-12: Environmental, Cost and Liability Reduction for Onsite Utilization of "Transportable Field Melter" Shared Between Pine Castle and Fallon Bombing Ranges for Recycling of Bombing Range Material Potentially Presenting An Explosive Hazard (MPPEH)	Transportable Field Melter for Recycling of Bombing Range MPPEH	NAVFAC
9.	143	N-0834-12: Demonstrate/Validate proposed MIL-P-85891 Type VIII Magic Media for Paint Removal of Aircraft Exteriors	Qualification of Proposed MIL-P-85891 Type 8 Plastic Media Blast (PMB) as a Replacement for Chemical-based Strippers and Existing Type 5/7 PMB	NAVAIR
10.	145	N-0829-12: Replacement of Film Radiography with Computed Radiography	Replacement of Film Radiography with Computed Radiography	NAVAIR
11.	146	N-0799-12: Emerging Drinking Water Constituents of Concerns and Marginal Drinking Water Quality at Navy Bases	Demonstration of Hybrid Ceramic Ultra-Filtration Technology to Address Emerging Drinking Water Constituents of Concern and Marginal Drinking Water at Navy Bases	NAVFAC
12.	147	N-0798-12: Vapor Intrusion Tool	Development of a Comprehensive Decision Framework for Assessing Vapor Intrusion at Navy Industrial Sites and Buildings	NAVFAC
13.	149	N-0795-12: Aircraft Wash Rack Oil/Water Separation	Aircraft Wash Rack Oil/Water Separation	NAVFAC
14.	152	N-0839-12: Request Review of Alternate Processes or Technologies to Aid in Reducing the Amount of Excess Paints that Becomes Waste	Excess Paint Reduction	NAVFAC

New Projects

The NESDI program has approved for funding the following 12 "new start" projects in FY12:

No.	ID	Title
1.	464	Tertiary Treatment and Recycling of Waste Water
2.	465	Demonstration of Passive Samplers for Assessing Environmentally Realistic Concentrations of Munitions Constituents at Underwater Unexploded Ordnance (UXO) Sites
3.	466	Separation, Detection and Removal of MEC/UXO rom Dredged Sediment Using Physical Separation
4.	467	Methodology to Assess Essential Fish Habitat for Navy Coastal Properties
5.	468	Low Cost Selective Polymer and Laser Interferometer Real Time Sensors for Detection of Solvents in Contaminated Groundwater Plumes
6.	469	Validation of a Low Tech Storm Water Procedural Best Management Practice
7.	470	Cyanide Waste Reduction of Electroplating and Stripping Process
8.	471	Site Analysis for the Detection and Classification of Munitions and Explosives of Concern in Shallow Highly Dynamic Underwater Environments
9.	472	Lead-Free Electric Primers for Medium Caliber Ammunition (ESTCP leveraged)
10.	473	Dynamic Mixing Zone Modeling
11.	474	Toxicity Associated with Polyaromatic Hydrocarbons Used in Clay Targets
12.	475	Mobile Pier and Facility Waste Water Treatment System

Who We Are

The NESDI program is the Navy's environmental research and development demonstration and validation (6.4) program, sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command.

The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials, and filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Fleet readiness.

Paint Overspray Enclosure & Blast Media for Delicate Substrates

Two more of our projects—an effort to demonstrate and integrate a low-cost, modular device that captures paint overspray and an alternative stripping method using corn hybrid polymer for coating removal and selective stripping of delicate substrates—are heading toward successful integration across the fleet. Both of these efforts are headed by Jim Howell (profiled in this issue of *NESDI News*) and described below.

Motion Assisted Environmental Enclosure for Capturing Paint Overspray in Dry Docks (#441)

Navy ships and submarines are subjected to harsh operating conditions. For this reason, ship hulls require antifouling coatings—some containing heavy metals such as copper and zinc. Although these coatings are critical to the preservation of ship hulls and even contribute to greater fuel efficiency, the heavy metals in the coatings are considered a hazardous material that must be carefully managed.

Current commercial spray painting methods can result in greater than 30 percent (by weight) of the applied paint going to waste through overspray. This overspray can settle onto dry dock floors and surrounding areas, where it may be incorporated in dry dock industrial operations or discharges associated with flooding or storm water runoff into nearby waterways.

In an effort to address these challenges, NESDI sponsored a project by the Naval Surface Warfare Center, Carderock Division (NSWCCD), in conjunction with Concurrent Technologies Corporation (CTC) and NORX, LLC, to develop a prototype Motion Assisted Environmental Enclosure (MAEE) designed to capture paint overspray.

The MAEE is a portable, lightweight enclosure that allows a painter to manually or semi-autonomously apply coatings with conventional spray equipment, on a boom lift or man lift with little or no overspray. The containment unit, or shroud, covers a small portion of the hull, allows operator access to the painting surface, draws and circulates air from within the enclosure to contain the overspray, and generates a positive, contact-free seal with the hull to prevent the overspray from escaping. The seal around the shroud is a pressurized zone created by a flow of air similar to an air curtain. Blowers on each side of the operator window clear paint overspray and fumes away from the painter and deposit them into the enclosure's filters.

Over the past three years, MAEE enclosure technology has been tested and evaluated during four shipyard operational assessments conducted under representative painting conditions. Following each test, prototype modifications and refinements were made based upon recommendations from painters or operators trained on the system and management personnel. Capture efficiency assessments conducted to date indicate that efficiencies on the order of 90 percent were achieved. The targeted goal is to capture more than 95 percent of the paint overspray.

MAEE technology is ready for transition to the Office of Naval Research's MANTECH program to further develop and refine the system design. The ultimate goal is to produce production-ready MAEE enclosures that are available to all Navy and commercial shipyards by either purchase or lease agreement.

The MAEE can be assembled on a conventional boom lift in approximately one hour.

The control system's micro-computer converts the operator's instructions into precise commands that follow along the ship's hull.

Integrating Technologies
(continued)

Evaluation of Corn Hybrid Polymer (CHP) Blast Media for Coatings Removal (#449)

This project was initiated in response to a need to develop an alternative stripping method for coating removal and selective stripping of delicate substrates (NESDI need N-0355-06). Federal, state, and local environmental, health, and safety laws, restrictions, and regulations have placed stringent emission and waste management requirements on Department of Defense (DoD) industrial operations involving coatings removal from military assets. As a result, prevailing manufacturing, repair, and rework practices have become increasingly difficult, less efficient, and more costly. DoD industrial facilities are therefore trying to reduce or eliminate emissions and waste associated with routine manufacturing, repair, and overhaul activities including coatings removal and selective stripping.

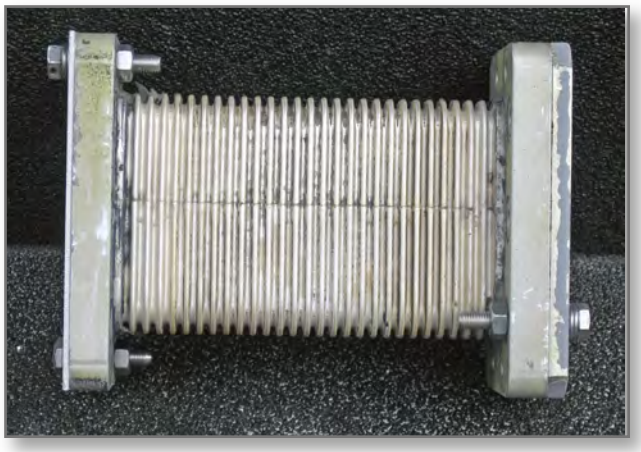
Delicate substrates, such as fiberglass, thin aluminum alloys, carbon fiber, graphite and Kevlar, can be easily damaged during the coatings removal process. These damaged substrates require rework, impede the performance of military equipment and vehicles, and result in reduced service life and increased equipment down time. In order to prevent damage while removing coatings, chemical strippers and manual coatings removal methods, such as pneumatic hand sanding, are utilized. These methods can release solvent vapors into the atmosphere, generate hazardous waste, and expose workers to potentially unsafe working conditions.

To address these issues, the NESDI program sponsored this project to:

1. Provide an effective, environmentally preferred media to remove coatings from difficult, high-value, Naval Sea Systems Command (NAVSEA) and Naval Air Systems Command (NAVAIR) delicate substrates
2 Introduce the media to facilities where it is not currently in use
3. Implement the use of CHP media on a broader and larger scale

Throughout the project, successful demonstrations were completed at three Navy shipyards with test specimens from other facilities including:

1. Norfolk Naval Shipyard
2. Naval Undersea Warfare Center Keyport
3. Naval Station Kitsap
4. Naval Air Station Whidbey Island
5. Puget Sound Naval Shipyard
6. Pearl Harbor Naval Shipyard
7. Naval Air Warfare Center (NAWC) Lakehurst



Aluminum antenna waveguide from Norfolk Naval Shipyard after being stripped with CHP.

Accomplishments to date include the following:

- NAWC Lakehurst has received formal NAVAIR approval to utilize CHP as a qualified Type VII media in their blasting processes, and added media-specific information into the Support Equipment Cleaning, Preservation, and Corrosion Control (17-1-125) manual.
- The Puget Sound Naval Shipyard and Intermediate Maintenance Facility is converting one of their blasting booths and a glove box/ cabinet blaster to CHP blast media.
- Portsmouth Naval Shipyard was impressed with the results documented by the Northwest regional and east coast demonstrations and are preparing a new shipyard blast booth for CHP use.
- Norfolk Naval Shipyard is considering the conversion of a glove box blaster to CHP for small delicate substrate items (i.e. waveguides).
- The Corpus Christi Army Depot has approved CHP for use on H-60 helicopter components (rotor blades) which includes Army, Navy and Marine Corps assets.
- Florida, Tennessee, North Carolina, Missouri, Mississippi, Kansas, Oklahoma, Utah, Texas and California are among the states that have already approved CHP for bio-based media recycling.

As a result of these efforts, manufacturing, repair and rework processes will become easier, more efficient, and less costly for the end user, thereby reducing health and safety risks compared to current hand sanding and chemical stripping methods of coatings removal.

These demonstrations confirmed that CHP media caused no damage to these substrates during coatings removal processes due to the nature of the media and the lower blast pressures used. CHP can be used in standard, light abrasive blast equipment and as a "drop-in" replacement for many plastic media blasting systems. The media can be re-used numerous (12 to 15) times, and can be recycled through an approved Treatment, Storage and Disposal Facility.

Overall, the project has provided Navy and other DoD facilities a more effective, environmentally preferred media to remove coatings from difficult, high-value, delicate substrates, including fiberglass, aluminum, carbon fiber, graphite and Kevlar.

For more information about these projects, contact Jim Howell at james.e.howell1@navy.mil. Jim is profiled in this issue of *NESDI News.*

The NESDI program is always looking for demonstration sites for our ongoing projects and sites where we can implement our finished products. Contact the NESDI Program Manager or your TDWG representative if you think your installation might benefit from one of the NESDI program's demonstrated technologies.

The Press & The Public Eye

On 17 January 2012, Joey Trotsky and his colleagues from our project **Operational Range Clearance—Alternative Green Targets (#289)** were awarded a patent for an "alternative steel and concrete target." U.S. Patent number 8,096,808 recognizes Trotsky and his fellow inventors—Jeff Karrh, Joseph Saenz, Leslie Karr (NESDI program manager), Luis Malvar, and James Tancreto—for "an alternative steel and concrete target (which) … is used as a hard target for training on high explosives bombing ranges." *Congratulations to Joey and his team.*

Results from our **Abiotic Treatment of 1,2,3-Trichloropropane to Protect Drinking Water Resources project (#434)** were included in a presentation at the 25th Symposium of the Groundwater Resources Association of California Series on Groundwater Contaminants. The presentation, entitled "Recent Advances in Remediation Technologies for 1,2,3-Trichloropropane," was given by Dr. Eric Suchomel from Geosyntec Consultants on 8 February 2012 in Concord, CA. Dr. Nancy Ruiz, the project's Principal Investigator, served as moderator for this session.

Ruiz has also submitted a paper entitled, **"Evaluation of Zerovalent Zinc for Treatment of 1,2,3-Trichloropropane Contaminated Groundwater: Laboratory and Field Assessment,"** to Ground Water Monitoring and Remediation for their review and consideration.

Names & Faces:
NESDI Profiles

In this issue of *NESDI News*, we are profiling Jim Howell — the Principal Investigator for our efforts to demonstrate and integrate a low-cost, modular device that combines semi-autonomous motion with portable containment to maximize operator productivity while capturing paint overspray. Jim is also heading up a project to develop an alternative stripping method using corn hybrid polymer for coating removal and selective stripping of delicate substrates.

Jim Howell

Organization
Naval Surface Warfare Center—
Carderock Division

Education
- B.S., Electrical Engineering,
  Johns Hopkins University

Experience
After eight years in the U.S. Air Force as a Calibration Technician, I spent 25 years as a Navy contractor at the Naval Surface Warfare Center (NSWC) in Annapolis, MD as a Calibration Laboratory Supervisor and Electrical Engineer. My last five years have been with NSWC—Carderock Division as an Engineer/Scientist in the Environmental Quality Division working on ship-to-shore research and development, test and evaluation related projects.

Role
My work with the NESDI program started as Principal Investigator for the Evaluation of Corn Hybrid Polymer Blast Media (project # 449) which provides an effective, environmentally preferred media to remove coatings from high-value delicate substrates and the Motion Assisted Environmental Enclosure (project # 441) which captures paint overspray during dry dock hull painting operations. In addition, I am the Principal Investigator on NESDI projects to develop dry dock surface cleaning and mobile pier waste water treatment technologies for Navy shipyards.

Connections
In addition to the NESDI program, I participate in other science and technology development efforts including ONR's science and technology program, the Environmental Security Technology Certification Program, the Strategic Environmental Research and Development Program, and the National Shipbuilding Research Program to help address a diverse range of environmental and productivity objectives. I accomplish this through daily collaboration with the Naval Sea Systems Command headquarters offices, shipyard industrial and environmental representatives, DoD program offices, private industry, and academia.

Perspective
The NESDI program is a valuable asset which helps identify challenging Navy environmental problems and their causes, and provides a means to develop and transition innovative technologies to remedy those problems.

For more information about Jim's projects or his role in the NESDI program, read the Integrating Technologies section or contact him directly at 301-227-5178 and james.e.howell1@navy.mil.

More Insights into Minimizing the Use of Hexavalent Chromium

On 22 December 2011, Mr. Sean Stackley, Assistant Secretary of the Navy for Research, Development and Acquisition, issued a memorandum on the Department of the Navy Hexavalent Chromium Authorization Process. In his memo, Mr. Stackley underscored the significance of an 8 April 2009 memo issued by the Under Secretary of Defense for Acquisition, Technology, and Logistics entitled "Minimizing the Use of Hexavalent Chromium (Cr6+)." This 2009 document recognized the environmental and human health risks associated with the use of Cr6+ and directed all military departments to take actions toward minimizing the use of Cr6+ where qualified alternatives are available. The Department of Defense further strengthened its commitment to the reduction of this hazardous material with the 5 May 2011 release of Defense Federal Acquisition Regulation Supplement (DFARS) 223.7303, "Minimizing the Use of Hexavalent Chromium (Cr6+)." The document attached to Mr. Stackley's memo outlines the Navy's authorization process for the use of hexavalent chromium, and "shall be used by Department of the Navy and all programs to be in full compliance with the DFARS regulation, while continuing to develop and field assets that meet mission-essential performance requirements."

As we mentioned in the summer-11 issue of *NESDI News*, the NESDI program is already taking steps to minimize the use of hexavalent chromium in the operation and maintentance of naval aircraft. The program is sponsoring a few projects where the primary objective is to reduce the use of hexavalent chromium including:

- **Advanced Non-Chromate Primers & Coatings (project #458).** This project is looking for a non-chromate coating system that will receive approval for use by the Naval Air Systems Command.
- **Navy Demonstration of Cadmium and Hexavalent Chromium Free Electrical Connectors (project #451).** This NESDI project will perform field testing of new protective finishes that do not contain cadmium or hexavalent chromium for use on military electrical connectors.
- **Nanocrystalline Cobalt Phosphorous (nCoP) Electroplating as a Hard Chrome Alternative (project #348).** This NESDI project will validate nCoP alloy electroplating as a drop-in replacement for hard chromium plating. The project will evaluate both Line-of-Sight as well as Non-Line-of-Sight applications and identify Navy requirements in support of acquisition systems integration.

The Naval Facilities Engineering Service Center provides a free Weekly Federal Regulatory Summary that DoD personnel or contractors supporting DoD may receive by e-mail. To subscribe, contact NFESCRegulatorySupportDesk@navy.mil or 805-982-2640.

January 2012 In-Progress Review Addresses Stormwater Management Issues

In an effort to address the emerging requirements associated with the ongoing challenges of effectively managing stormwater at Navy facilities, the NESDI program convened a meeting of stormwater end users, researchers and policymakers in San Diego on 10-11 January 2012. Communication, communication and more communication was the overriding theme of this two-day In-Progress Review (IPR)—better and more frequent communication among program personnel, Principal Investigators and end users who share in the responsibility to ensure that NESDI projects are efficiently executed and results are successfully transitioned.

Nearly three dozen participants from across the Navy gathered to hear briefings about ongoing projects, provide valuable feedback to Principal Investigators, and brainstorm on a roadmap for future program stormwater investments. In addition to personnel from the program's resource sponsor organization (CNO N45), end users from Naval Base San Diego, NAVFAC Southwest, NAVFAC Northwest, NAVFAC Hawaii, and NAVFAC Mid-Atlantic joined NESDI personnel in person and over the phone to ensure existing projects and future investments are properly focused.

Follow-on tasks include a stormwater investment strategy (roadmap) and other IPRs to be held in other Navy regions to bring more end users into the fold. For more information, contact Cindy Webber at cynthia.webber@navy.mil and 760-939-2060.

PROGRAM SCHEDULE

In this section of *NESDI News*, we provide insights into our annual program schedule. For the next few months, the program will concentrate its efforts on collecting and evaluating full proposals. Check our web site for the latest version of our program schedule.

No.	What	When
1.	**Collect Full Proposals**	**23 February 2012**
2.	**Collect Functional Working Group Comments on Full Proposals**	**9 March 2012**
3.	**Collect TDWG Comments on Full Proposals**	**21 March 2012**
4.	**Screen Full Proposals**	**26-30 March 2012**
5.	**Evaluate Full Proposals**	**18-22 June 2012**
6.	**Obtain Sponsor Review & Approval of Full Proposals**	**9-23 July 2012**
7.	Conduct In-Progress Reviews	West: 7-11 May 2012 East: 18-22 June 2012
8.	Announce New Starts	30 July 2012
9.	Quarterly Status Reports Due (all Fridays)	13 April 2012 13 July 2012 19 October 2012 18 January 2013
10.	Conduct N45 Programmatic Review	TBD January 2013
11.	Announce FY13 Needs Solicitation	01 June 2012
12.	Close FY13 Needs Solicitation	01 August 2012
13.	Screen Needs	13-17 August 2012
14.	Evaluate & Rank Needs	10-14 September 2012
15.	Obtain Sponsor Review & Approval of Needs	24 September – 5 October 2012
16.	Request Pre-proposals	12 October 2012
17.	Close Pre-proposal Collection	14 November 2012
18.	Collect TDWG Comments on Pre-proposals	26 November 2012
19.	Evaluate Pre-proposals	27-30 November 2012
20.	Request Full Proposals	13 December 2012

USING OUR WEB SITE

The next significant milestone on the NESDI program schedule is the collection and evaluation of full proposals. To be considered in this year's evaluation cycle, all principal investigators must submit and complete their full proposals by Thursday, 23 February.

To submit a full proposal, after logging onto the NESDI web site (at www.nesdi.navy.mil) with your username and password, select the "Projects and Proposals" link then the "Submit a Full Proposal" link. A list of your pre-proposals available for full proposal submission will be provided. The "Submit" link will migrate the data from the corresponding pre-proposal into the full proposal format including the need addressed, problem statement and some of the information describing the technology. The web site will generate an automated email to the Principal Investigator confirming this migration and request the additional information necessary to complete the full proposal. This includes the project's technical objective and risks, a schedule of milestones, financial requirements and performers as well as any supporting documentation (files and images) that may be warranted.

Direct any questions about the use of our web site to Eric Rasmussen, our webmaster, at 732-323-7481 and eric.rasmussen@navy.mil.

www.nesdi.navy.mil

NESDI NEWS

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GETTING ON OUR MAILING LIST

If you're not already on our mailing list and want to subscribe to *NESDI News*, please send your email address to Lorraine Wass at 207-384-5249 or ljwass@surfbest.net and we'll add you to our distribution.

CONTACT US

For more information about the operation of the NESDI program, contact Leslie Karr, the program manager, or members of the TDWG—the program's management team.

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IN THE NEXT ISSUE OF *NESDI NEWS*

There is a lot more information coming your way in the next issue of *NESDI News: Highlights & Happenings.* In our Spring-12 issue we will reveal the results of our solicitation for full proposals and provide you with more information about our upcoming west coast and east coast IPRs.

Until then, look for an article about the results of our research entitled "Zero-Valent Zinc Shows Promise for Removing TCP from Groundwater: Studies Show Positive Results Removing Recalcitrant Compound from Pendleton Well" in the spring issue 2012 of *Currents*—the Navy's energy and environmental magazine. Read *Currents* on-line and subscribe to the magazine at http://greenfleet.dodlive.mil/currents-magazine.