US Army Corps of Engineers ®

The Corps Environment

July 2004 Vol. 5, No. 3

photo by Michael Walsh

The New England District is proposing to dredge the entrance channel to the Great Salt Pond in Rhode Island.

Corps proposes dredging project

By TIMOTHY DUGAN
New England District

The U.S. Army Corps of Engineers New England District is proposing to perform maintenance dredging of the entrance channel to the Great Salt Pond federal navigation project in Block Island, Rhode Island.

The proposed work involves maintenance dredging of the 18-foot deep Mean Lower Low Water (MLLW) entrance channel to the Great Salt Pond federal navigation project.

"Natural shoaling processes have reduced available depths to as little as 7.6 feet deep MLLW in the entrance channel and is making navigation to and from the anchorage hazardous at lower stages of the tide," said Project Manager Michael Walsh, of the New England District Programs and Project Management Division. "Maintenance dredging of about 100,000 cubic yards of sand from approximately 12 acres of the authorized project area will restore the project to authorized dimensions."

Maintenance dredging was last performed in 1982, with previous dredging projects occurring in 1972 and 1963. An emergency dredging effort was last performed in 2000, when 12,250 cubic yards of material from a hazardous shoal were removed and disposed of at a near shore disposal site located off the east side of the island.

"There is a shoal at the eastern (inner) end of the entrance channel which is particularly impacting ferry service to the island," Walsh said. The Corps is pursuing the option of an expedited dredging effort focused on removing that shoal down to elevation 14 feet deep MLLW, representing about 20,000 cubic yards of material using the Corps' special purpose dredge Currituck.

The remaining work will be performed by a private contractor under contract to the government. Either a mechanical dredge or a hopper dredge will be used for the private contract dredging work.

The Town of Shoreham officials have requested that this project be maintained. The town is the local sponsor for the proposed work. The existing project was authorized in the River and Harbor Act of 1896, and modified by the Acts of 1902 and 1945.

The work will be performed during a three-to-four month period between October and June, and will be accomplished in the year or years in which funds become available, contin-

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The Corps Environment

is printed quarterly by the U.S. Army Corps of Engineers as an unofficial newsletter published under the provisions of AR 360-1. The purpose of this newsletter is to provide information about Corps environmental actions, issues, policies and technologies. Opinions expressed are not necessarily those of the U.S. Army. Inquiries can be addressed to U.S. Army Corps of Engineers, Attn: CEHNC-PA, P.O. Box 1600, Huntsville, AL 35807-4301. Phone: (256) 895-1235 or fax (256) 895-1689.

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The Corps Environment welcomes submissions. Please send your information (article, photos, events, letters to the editor, etc.) or questions via e-mail to: Troy.D.Darr@HND01.usace.army.mil

Deadline for publication:
Feb. 15 (April issue)
May 15 (July issue)
Aug. 15 (October issue)
Nov. 15 (January issue)
All submissions are subject to editing.

The Corps Environment is available on the World Wide Web at:hq.environmental.usace.army.mil/newsinfo/current/current.html

Watershed principles guide Civil Works plan

The U.S. Army Corps of Engineers has unveiled its five-year strategic plan for its Civil Works mission – a plan committed to sustainable watershed development, environmental restoration, modernizing infrastructure, effective disaster response capabilities, and world-class public engineering.

The *Strategic Plan for the Civil Works Program for Fiscal Years 2004-2009* emphasizes applying watershed principles as the guidepost for directing program activities. It sets five key strategic goals and 13 objectives, recognizing that the Corps must join others and take a watershed approach if it hopes to help solve the nation's water challenges.

"This plan is a living document, subject to change, but it's important to put down this marker as the Corps places ever greater emphasis on working in collaboration with others in a watershed planning environment," said John Paul Woodley, Jr., the Assistant Secretary of the Army (Civil Works).

The plan's strategic goals are:

Goal 1: Provide sustainable development and integrated management of the nation's water resources

Goal 2: Repair past environmental degradation and prevent future environmental losses

Goal 3: Ensure that projects perform to meet authorized purposes and evolving conditions

Goal 4: Reduce vulnerabilities and losses to the Nation and the Army from natural and man-made disasters, including terrorism

Goal 5: Be a world-class public engineering organization

To achieve the goals, it is necessary for the Corps to integrate problem-solving activities with others through collaboration by bringing a variety of resources, authorities and perspectives to the table. The Corps pledges to strengthen existing partnerships and develop new partnerships with federal, state and local entities as well as Native American tribes, non-governmental organizations and the private sector to solve complex water resources problems.

In a January speech at the 19th Annual Everglades Coalition Conference in Florida, Chief of Engineers Lt. Gen. Robert Flowers summarized the plan's fundamental principles. "Today's Corps has a broader perspective," he said.

"We've come to understand that national security includes having communities that are economically, environmentally, and socially healthy. We've also learned that to meet our nation's needs, we must take a watershed approach to solving water challenges."

The Corps has formed a Watershed Project Delivery Team at Headquarters to promote the use of watershed principles. One of its first tasks is to create a toolkit of case studies of how the Corps already uses watershed principles, lesson learned, models and authorities.

The complete plan is available at www.usace.army.mil/inet/functions/cw/hot_topics/cw_strat.htm.

Portland District begins EMS developmental project

In January, the U.S. Army Corps of Engineers Portland District Channels and Harbors Project was selected to participate in a developmental program sponsored by the American Association of Port Authorities (AAPA) and partnership with the U.S. Environmental Protection Agency. The program, called Environmental Management Systems (EMS), provides a systematic way to evaluate and improve operations for better organizational performance.

The goal is to further the incorporation of environmental considerations into the organization's decision-making structure.

The operations of focus (specific fence line) include activities at the U.S. Government Moorings shipyard located in Portland, Ore., the hopper dredges Essayons and Yaquina, and the Hydro Survey Operations section.

The Corps, along with 10 other port agencies throughout the United States, will participate in this developmental program for two years. Global Environment and Technology Foundation (GETF), a non-profit organization, provides technical assistance and guidance to the participants on EMS development.

"An EMS is not about re-inventing the wheel, but rather, evaluating existing systems to improve operations," said Carolyn Markos, site environmental compliance coordinator and EMS program lead.

The Portland District has developed a core team, a critical element in EMS operations. Team members include dredge captains, supervisors, and managers. These people are critical for communicating information and policies to employees and providing input on improving operations.

Benefits realized include: Improved efficiency, improved environmental compliance, increased staff awareness, use of a common standard framework for environmental compliance, and improved relationships with the regulatory community, according to Markos.

Portland District's Channels and Harbors Project has completed several EMS implementation activities to-date. These include selecting a fence line or area of focus, appointing an EMS management representative and core team and outlining team roles and responsibilities, confirming top management understanding and commitment, and defining the organization's goals or the rationale for developing an EMS.

Louisiana coastal marshes benefit from partnering efforts

Louisiana's Cameron Creole Watershed – Marsh Terracing Project was recognized by President George W. Bush and received the state's 2003 Coastal American Partnership Award in October at Cameron Prairie National Wildlife Refuge.

Emil Frankel, Assistant Secretary for Policy, U.S. Department of Transportation, presented the award and plaques to individuals who were instrumental in making this project a reality.

The project began when the Louisiana Department of Transportation and Development submitted a Section 404 permit application for the expansion of an existing highway to serve as a hurricane evacuation route from the coastal regions of Cameron Parish. Barry Obiol, Regulatory Branch, New Orleans District, was the assigned project manager.

The most difficult aspect of the project was the fact that federal land belonging to Cameron Prairie National Wildlife Refuge was to be directly affected by the highway expansion. In addition to mitigation required for impacts to marsh wetlands, the taking of federal lands for a state project required a replacement of land of equal value and function. Mr. Obiol had recently issued a permit for a marsh plowed terracing demonstration project and suggested that a similar type project be used for mitigation and the required conversion.

The idea was well received and that is where the partnering aspect of this endeavor really shined. The legal and administrative agreements, funding, and project design required the work of the Corps, state and parish regulatory and resource agencies, federal and state highway agencies, and private interests including Ducks Unlimited, North American Wetlands Conservation Council Miami Co., North American Land Co. and Shell Oil Foundation.

The project grew through additional funding sources that expanded the scope of work from that which was required for regulatory mitigation and the replacement of Refuge lands to a project that provided 26 linear miles of terracing.

Ducks Unlimited recommended the innovative Duck-Wing design of the plowed terraces. The terraces in a "V"-shape provide dampening of wind and wave action upwind of the terrace, thus providing a greater, more frequent calming effect in the open water areas upwind of the terraces.

Approximately 3,226 acres of open water marsh lands have been protected using 26 miles of plowed terraces, and protecting on the inland side more than 20 miles of salt marsh shoreline.

The terraces, planted with smooth cordgrass, now provide buffering to minimize the erosive effects of wind and wave action upon the existing fragile marsh. This has provided protection to marshlands that serve as habitat to fish and wildlife resources in a state that is currently losing 25 square miles of wetlands to open water each year.

People from many federal, state and local governments and private organizations involved with the project were honored. Barry Obiol, who is a senior project manager for the USACE, New Orleans District Regulatory Branch, received a plaque and a letter of commendation from President Bush for his part in this project.

For more information contact the New Orleans District Regulatory Office at (504) 862-2041.

President creates new task force

President George W. Bush has signed an Executive Order creating the Great Lakes Interagency Task Force, to be led by EPA.

The Task Force, unveiled in a ceremony May 18, brings together the 10 Agency and Cabinet officers whose agencies, including the U.S. Army Corps of Engineers, administer more than 140 different federal programs that help fund and implement environmental restoration and management activities in the Great Lakes basin.

The president also instructed EPA Administrator Mike Leavitt to engage the Council of Great Lakes Governors and the Great Lakes Cities Initiative to convene a complementary process of regional collaboration.

"Collaboration and coordination – building on the broad collection of existing efforts while ensuring leadership and accountability at the national and international level – is clearly a better way," Leavitt said. "It is only through the transparent consideration of the rich diversity of perspectives surrounding this international treasure that we can truly accelerate remediation, restoration, protection and conservation."

The Great Lakes — Superior, Michigan, Huron, Erie and Ontario — form the largest surface freshwater system on the Earth. More than 30 million people live in the Great Lakes basin, and the daily activities of these people, from the water consumed to the waste returned, directly affects the Great Lakes environment. Major stresses on the lakes also include toxic and nutrient pollution, invasive species and habitat degradation.

The United States and Canada both have jurisdiction over the Great Lakes Basin. Within the United States, the EPA and nine other agencies together administer more than 140 different federal programs helping fund and implement environmental restoration and management activities in the Great Lakes basin.

Activities will include removing contaminated sediment, expanding restoration projects, addressing invasive species, improving agricultural conservation, enhancing water quality, improving air quality, focusing research, and promoting international activities. The U.S. Army Corps of Engineers will be engaged in many of these activities.

John Paul Woodley, Jr., Assistant Secretary of the Army (Civil Works), accompanied Leavitt to the press conference announcing the formation of the task force.

"We are excited about this initiative and eager to work with the Task Force to help protect and restore the Great Lakes," Woodley said.

District schedules lake cleanup

By DEB ATHERTON
Mobile District

The 19th annual Great Lake Allatoona Cleanup is scheduled for Sept. 18.

Allatoona Lake in Cartersville, Ga., has supported Public Lands Day for 18 years by organizing The Great Lake Allatoona Cleanup. The cleanup is a one day event where approximately 5,000 volunteers come together to pick up trash from 240 miles of shoreline.

Volunteers are given a commemorative patch that will allow them to come and enjoy food, entertainment, recognition and prizes following the cleanup at Allatoona Landing and Resort.

The entire community benefits from this worthwhile event. Most of the volunteers are local Boy Scout, Girl Scout and church groups while Corps employees direct traffic and prepare food.

This is a great way for them to take an active role in becoming good stewards of the environment.

District provides habitat for oysters

By HANK HEUSINKVELD
Wilmington District

Oysters need a big boost from humans in North Carolina and they need it now.

That was the general consensus at An Encore for Oysters conference hosted by the North Carolina Coastal Federation in Morehead City March 16 and 17. The situation is critical to the point that oysters are being shipped for consumption to North Carolina from around the U.S. because of dwindling oyster populations up and down the coastline.

Much of the problem lies with over harvesting and pollution from storm runoff in developed areas that gets into the oysters habitat and stresses the organisms. But of more concern is too few sustainable oyster reefs exist. That's where the Corps is contributing its expertise.

The first time the Wilmington District successfully incorporated oysters in a coastal ecosystem restoration project was in 1994 while mitigating impacts from repair and improvements to the U.S. Army Reserve Center in Morehead City. An environmental assessment prepared by the Corps on behalf of the U.S Army Reserve Command identified impacts to marsh and shallow estuarine habitat from dredging and dock rehabilitation that required mitigation. As a result the Corps built a 5.5-acre estuarine creek marsh complex.

"We reshaped and restored a long-unused upland disposal area near the Morehead City Harbor to function as an estuarine ecosystem," said Wilmington District biologist Chuck Wilson.

After the creek was opened to tidal exchange oyster bars of shells, also known as "cultch," were placed just above mean low water to provide new sites for oyster attachment. The Corps was confident that the site would meet its mitigation requirements. However, no one could foresee that it would become such a highly productive, healthy ecosystem with an oyster population sustained for almost a decade.

The science of ecosystem restoration has come a long way since the early days, when a single marsh species was planted for low cost shore protection. Things improved dramatically when the Corps' Wilmington District had an opportunity to work with the National Marine Fisheries Service developing pilot restoration projects throughout the country for fish habitat rather than shoreline protection alone.

The Wilmington District, in cooperation with other federal agencies and university scientists, built three sites in North Carolina to establish an estuarine diverse marsh community to improve fish habitat.

"When these projects were constructed we didn't really understand the importance of 'context' or in other words, 'how the site would fit in the surrounding natural estuarine ecosystem'," explains Wilson. "These shoreline restoration projects provided fish habitat, as designed, but had an angular, engineered appearance. We wondered if a marsh, constructed with a more natural look, would have more environmental value. As we developed the restoration plan for the Army Reserve Center site we got away from the shoreline approach and carved out the center of an abandoned upland disposal site, leaving the natural marsh and shrub vegetation that surround the island intact."

The rejuvenated site was engineered to precision. The marsh is located away from turbulent waters providing a protected nursery area with enough tidal exchange to promote good water quality and to provide ample marine larvae and enough nutrients to keep aquatic plants and oysters healthy.

Biologist Doug Piatkowski says that there's value in the restored site, but it's more than the economic value determined by how many oysters are harvested. Rather, its value is determined by multiple habitat functions and their interconnectedness that supports maximum environmental output.

"We look at oysters as habitat," he says. "They provide more surface area for attachment of organisms than any other hard structures that we have in our waters. They also provide a separate component to our habitats that we're trying to build. When we build a site like the one at Morehead City, we have our primary nursery as a result of marsh construction and adjacent to the marshes we have the oyster habitat. They provide the structure and surface area for attachment of organisms within the marsh system. These habitats are so interrelated that you have to have these different components to make a complete restoration project. So, it's a whole other chain of events that evolve from the interrelated nature of multiple habitat components within the

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Jeff DeBlieu of The Nature Conservancy checks the water temperature to induce oysters to spawn as Wilmington District members Jenny Owens and Doug Piatkowski observe. The oysters are being studied at Carteret County Community College in Morehead City.

Spring Valley team resumes Lot 18 work

By MARY BETH THOMPSON
Baltimore District

The U.S. Army Corps of Engineers has resumed digging on an American University parcel of land called Lot 18.

The Lot 18 excavation is part of the Baltimore District's ongoing investigations at the Washington, D.C., Formerly Used Defense Site known as Spring Valley.

The discovery of lewisite among the items recovered from Lot 18 last year has turned what was a low-probability dig into a high-probability dig for the Spring Valley project.

Lewisite is a liquid developed as a chemical weapon for war use. During World War I, the American University Experiment Station was a center of U.S. Army chemical research, development, testing and training.

The experiment station developed methods for the preparation, manufacture and use of lewisite. It operated on and near the campus, on land that is now Washington's Spring Valley neighborhood.

Changing from a low-probability of finding chemical warfare material to a high probability means a new work plan must be written, additional safeguards put in place and a higher level of concern for public safety attended to, said Project Manager Craig Georg.

"That ensures that we have developed our plans to accurately address what could be found," he said.

The team anticipates it will unearth debris, municipal trash and glassware, Georg said. They do not expect to uncover an explosively configured chemical round, but the possibility of finding lewisite again has raised this dig to high-probability.

"We expect to find pretty much what we've found in the past," he said. "We've been out there before, and we have a site history at this location."

Working with the Engineering and Support Center, Huntsville, the U.S. Army Technical Escort Unit, and the Edgewood Research and Development Engineering Center, the Spring Valley project delivery team is writing a work plan and developing a public protection plan for Lot 18.

At the same time, Huntsville has been revamping the Site-Wide Chemical Safety Submission Plan, which covers the entire project and affects the work plan for Lot 18.

One task was to determine a maximum credible event, or MCE, for the Lot 18 dig.

"An MCE is the worst single event that could occur at any time with maximum release of chemical agent as a result of unintended, unplanned or accidental occurrence," said Huntsville's Allyn Allison during a presentation to project partners, the Environmental Protection Agency, the D.C. Department of Health and American University. The Corps also sought input from the Spring Valley Restoration Advisory Board and the community at large.

For Lot 18, the partners agreed with the Corps' analysis that the evaporative release of lewisite from a bottle would be the MCE. The work, safety and public protection plans are being geared toward handling that MCE.

Another task was to decide how to carry out the dig. Again, the partners discussed several alternatives and agreed with the Corps' recommendation to use an engineering control structure over the dig site. The uneven terrain at Lot 18 made a tent structure the chosen option. A tent is more easily moved and sealed to the ground than a hard-sided structure.

The tent will be negatively pressurized so that air will flow from inside through a filtration unit to the outside, Craig said. The negative pressurization makes it difficult for an accidental release of chemical agent to escape the structure.

Filters are designed to trap and eliminate chemical agent. Monitors will check the air inside and outside of the tent for accidental release. An alarm will ring should chemical agent be detected.

"To the neighborhood, it means we're going to be a lot more visible on site with our logistical support," Georg said. "It 'll look different, but the residents will be safe."

With the protections that will be used, the team believes the possibility of a chemical release that could affect the neighborhood is extremely isolated. A probability study assessed the chance at one in 50 million.

"It would be a very remote possibility for all the precautions to have failed," Georg said. "There are three things that would have to happen at the same time—the tent has a breach, the engineering controls fail, and we actually have a bottle of lewisite that's fallen and broken and spilled."

As an additional safety measure, the nearby occupants of American University buildings and neighborhood residents will be taught Shelter-in-Place techniques, which are designed to minimize their exposure to an accidental release.

For more information contact the Baltimore District Public Affairs Office at (410) 962-4088.

Oysters

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marsh ecosystem."

Piatkowski adds that oysters play an important role in ecosystems because they provide filtering functions. As oyster populations decline water quality is impacted. By providing habitat for oysters there is a better chance of filtering impurities.

Wilson and Piatkowski say the site at Morehead City is a good model that shows it's possible for humans to think with a design-by-nature approach in order to best replicate what Mother Nature intended. Piatkowski feels the time is right to set the stage for the Corps to highlight its unique services.

"We have the perfect opportunity now with our engineering and design expertise to really take off," he says. "Right now we have a mesh between science and engineering that we never had before and we can take that approach to help in this oyster restoration process. I think it can become a great opportunity for the Corps, if not just our District, to start working at getting these projects going. I believe it will build huge relationships with other organizations because we also have the authority to do these projects with a non-federal partner."

Wilson believes relationships were built with other agencies at the conference. He said, people simply don't know that the Corps is in the environmental restoration business.

"Our goal was to show the accomplishments we've had in ecosystem restoration and focus on the projects that you can actually see."

Piatkowski believes it's an evolutionary process of gaining trust from fellow scientists and biologists.

"I don't think that people realize that ecosystem restoration is one of our primary missions now. Now, people are finding out that it's just as important as the navigation function. And that's really big."

For more information contact the Wilmington District Public Affairs Office at (910) 251-4646.

Breakwaters to halt erosion in Galveston Bay

Work on a portion of the Environmental Protection Agency's designated Tex Tin Superfund Site had another step completed when the contractor finished work on the construction of breakwaters designed to halt erosion along the Galveston Bay side of the former smelter site in Texas.

The area, officially called Operable Unit No. 4, now holds a four-segment quarry rock breakwater nearly 6,000 feet long. Only one segment touches land, the other three segments are staggered to allow circulation of salt water into the area that will soon hold a 90 acre marsh according to plans laid out by Texas Parks and Wildlife.

The proposed marsh, in part, will be built from excess material dredged from the Shoal Point container terminal construction. Lead agency on the marsh construction will be the Natural Resource Damage Assessment Trustees.

The breakwaters are located just east of the shell islands that form the eastern boundary of Swan Lake. The northern three breakwaters extend in a single file, north to south, from an existing breakwater located on the northeast side of Swan Lake. The fourth breakwater, located south of these three, runs northeast to southwest and onto the land.

The tops of the stone structures are about 3.5 feet above the waterline and are about 5 feet wide at the crown.

The U.S. Army Corps of Engineers, Galveston District, was charged by EPA with the project design and construction oversight. Pine Bluff Sand and Gravel, Pine Bluff, Arkansas was chosen as contractor for the work on the more than $2 million job. Original estimate for the construction work was close to $3 million.

U.S. Army photo

Andy Tirpak (left), Texas Parks and Wildlife, and Keith Tischler, Texas General Land Office, discuss the Superfund site project on a final inspection tour.

Thirty-four barge loads of rock were required to complete the stone breakwaters, coming via water from Arkansas to the site in 6-barge tows.

The Tex Tin smelter, located in the cities of La Marque and Texas City, Texas near the intersection of FM 519 and State Highway 146, was built by the government as a World War II emergency tin supply plant and operated from 1941 to 1956 as the Tin Processing Corporation. The facility was sold to private industry in 1957 and was operated by a succession of companies until it ceased operation in 1991. On June 17, 1996, EPA proposed the site as a Superfund site.

The Superfund site contains four operable units. No. 1 contains about 140 acres and is the former tin and copper smelting facility and includes four of the holding ponds to the south of the smelting facility. No. 2 contains 27 acres of the former smelter property that is owned by BP Amoco Corporation. OU No. 3 represents the La Marque residential areas northwest from the smelter facility. OU No. 4 is comprised of the Swan Lake ecosystem located between the hurricane levee and the shell barrier islands separating Swan Lake from Galveston Bay.

Personnel from the Corps, EPA Region 6, Tex Tin Settling Defendants, Texas Parks and Wildlife, and Texas Government Land Office, and National Oceanic Atmospheric Administration toured the completed project by boat on Jan. 27.

For more information contact the Galveston District Public Affairs Office at (409) 766-3994.

District develops lagoon restoration plan in Florida

The U.S. Army Corps' Jacksonville District worked closely with an array of public and agency representatives to develop a restoration plan for the southern Indian River Lagoon from 1996 to 2004.

The Project Implementation Report for the Indian River Lagoon - South is now under review by Corps headquarters staff. The report demonstrates the key roles that dedicated staff, good science and public involvement play in leading to success.

Martin and St. Lucie counties, Florida's "Treasure Coast," contain some of the state's most productive and most threatened estuarine treasures, the Indian River Lagoon and St. Lucie Estuary. As part of the larger Indian River Lagoon (IRL) region, the lagoon and estuary are home to more than 4,300 species of plants and animals, and support an annual regional economic contribution of more than $730 million.

Belying its scenic beauty and natural diversity, is the decline in the IRL region's ecological health. The lagoon and estuary have suffered from altered water flow patterns and degraded water quality. In the past few years, excessive rains required additional floodwater releases into the estuary from Lake Okeechobee. These freshwater releases, combined with excess stormwater runoff, arrive in the estuary through drainage canals and alter the salinity balance of the estuary's unique ecosystem.

Also contributing to the degradation of the IRL is the increase in runoff from outdated stormwater management systems and the development of neighborhoods and farms that have cropped up all around the estuary's 827-square mile watershed. The IRL is showing signs of stress, but it will benefit greatly from an

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Corps efforts at Superfund site provide success story

Work at the Brio Refinery Superfund Site is finished. Environmental Protection Agency Region VI marked completion of the construction phase of containment remediation at the Brio Superfund Site on Nov. 13 .

Approximately 20 miles southeast of Houston, Texas, the Brio site was the target of intensive efforts by the Environmental Protection Agency to clean up the reported more than half -million cubic yards of contaminated soil.

The 59-acre site's history starts back in the 1950's when it was used as a chemical reprocessing facility for materials that were to be reused in other industries. The principal pollutants were found in earthen pits where the materials to be reprocessed were stored. Styrene tars, vinyl chloride, chlorinated solvent residues, metallic catalysts and fuel oil residues were found in abundance.

The State of Texas ordered the closure of the pits in the late 1970's. In 1984, EPA, under the Superfund Law, proposed to include the site on the National Priorities List.

In the early 90's, area residents became concerned about the proposed incineration of all on-site materials and worked diligently with the Superfund Revitalization Office to find a different remedy. The locals prevailed and instead of burning the material, it was decided to cap the polluted soils inside a lined pit.

"I am especially proud of the cooperation between the community and government agencies at Brio. The community was a strong and valued partner in selecting and implementing the remedy," said EPA Regional Administrator Richard E. Greene.

Approximately 5,000 people live within a mile of the site with the nearest residence less than 500 yards from the contaminated area.

Working with EPA, Galveston Districts performed engineering and construction oversight, and Tulsa District administered the contract, laid out the scope of work, negotiated the price and monitored the payments.

The "Brio Site Task Force" headed up by a spin off of the Monsanto Company, performed the design and construction. Galveston District provided the on-site monitoring of the work.

Under the Superfund law, if the site's owner/operator is insolvent, those companies that did business with them must assume liability for the cost of cleanup. These companies, known as the Brio Site Task Force, were responsible for implementing the remedy.

U.S. Army photo

The slurry wall, built of sheet pile, surrounds the contaminated area, and will be covered with a clay cap.

From on-site incineration, the remedy became a pit, lined with a barrier wall, a cover system and an ongoing underlying groundwater and dense liquids recovery and treatment program. The pit was capped with clay while a 50-foot deep slurry wall encircled the contaminated area.

"By combining forces, the Corps of Engineers was able to provide the customer with less expensive and more efficient services," said Richard Tomlinson, Brio project manager for Galveston District. "The Brio Refinery Project was a very interesting project. It truly was a bellwether, leading the way for all U.S. Superfund sites by writing the book on public involvement, air monitoring and dense non-aqueous petroleum liquids removal."

In the end, approximately 100,000 gallons of highly contaminated sludges and solids were removed from the site. More than 25 million gallons of ground water were treated and approximately 38,000 gallons of dense non-aqueous petroleum liquids (DNAPL) were removed from the site and more than 84,000 gallons of DNAPL were removed from underneath the former storage pits.

Care was taken throughout the project to ease the concerns of residents. Air emissions was one of the most important issues to the surrounding community members, so the Task Force constructed a $1.3 million air monitoring system to allay the community's concerns. This was dismantled in 1999, as it was no longer needed.

"The remediation of the site has been a satisfying feat for all those involved, the public, the EPA and the Corps," said Col. Leonard D. Waterworth, commander and district engineer of the Galveston District.

The Brio Site Task Force will continue ongoing operation and maintenance of the site.

For more information contact the Galveston District Public Affairs Office at (409) 766-3994.

U.S. Army photo

Articulated concrete mats protect the contaminated area from erosion from a nearby bayou.

Savanna Army Depot wins environmental award

The Chief of Engineers Design and Environmental Awards, a program created by the U.S. Army Corps of Engineers to recognize excellence in design and environmental achievements, has honored Savanna Army Depot Activity in Illinois with an Award of Merit. The Merit Award recognizes the multi-agency team for its design and implementation of an Ecological Risk Assessment on the Open Burning Ground.

The Ecological Risk Assessment Report, completed in July 2003, evaluated the level of contaminants in the soils, sediments and surface water to determine if it poses a concern to the natural habitat and species. The $2 million assessment gathered hundreds of samples over four months and thoroughly analyzed the results.

The specially designed study used a variety of techniques to provide direct evidence whether or not the habitat and wildlife may be affected by past burning, demolition and disposal of ordnance materials at Savanna Army Depot. The study used two different techniques to analyze the contaminant levels in flying insects that are in the direct food chain for the endangered species, the Indiana bat.

The study also analyzed lead in very small soil particles, which are eaten by birds and waterfowl to help digest their food. Both analyses determined that the Indiana bat and birds and waterfowl were not affected by eating species in their food chain. The team also studied the affects on frogs, fish, earthworms and vegetation.

Plant, insect, and fish tissues were collected to evaluate the potential metal and/or explosives exposure to herbivore (plant-eating, i.e., mouse), insectivore (insect-eating, i.e., Indiana bat), and piscivorous (fish-eating, i.e., mink, otter or Bald Eagle) receptors, respectively. A bioaccumulation study was conducted using a series of soil samples to evaluate the metals and explosives in earthworms to evaluate exposure to vermivores (worm-eating, i.e., American robin and shrew).

U.S. Army photo

Workers collect fish samples from a slough adjacent to Savanna's Open Burning Ground for metals analysis using a boat-mounted electroshocking unit.

The results of the assessment indicated five small isolated areas estimated at a total of one acre of the 120-acre open burning ground may be impacted by lead and TNT contamination. This will reduce the estimated cleanup costs by $40 to $60 million and help protect the area habitat and species when the cleanup is completed.

"Based on our original design model, we thought the impact to the environment would be much greater. But after conducting the assessment, we found that the amount of explosives contaminated soils affecting the ecological system was actually at a very low risk," said U.S. Army Corps of Engineers, Louisville District Risk Assessor, Elizabeth Ferguson.

The multi-agency partnership responsible for the design, plan and implementation of the Ecological Risk Assessment includes members of Savanna Army Depot Activity, U.S. Army Corps of Engineers Louisville District, U.S. Fish and Wildlife Service, USEPA, Illinois EPA, Illinois Department of Natural Resources, U.S. Army Center for Health Promotion and Preventive Medicine, and the contractor, MWH Americas, Inc. and their subcontractors.

The Savanna Army Depot Activity is a 13,062-acre Army installation located on the eastern bank of the Mississippi River in Carroll and Jo Davies Counties.

The facility was used in 1917 to proof and test cannons and stored ordnance and loaded shells and bombs. The Depot was identified for closure under the Base Realignment and Closure Act in 1995 and officially closed on March 18, 2000.

For more information contact Environmental Public Affairs, Program and Project Management, Louisville District at 502-315-6835, or by e-mail at Kimberlee.B.Turner@lrl02.usace.army.mil.

Lagoon

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aggressive restoration and protection effort that focuses on its open water bodies, coastal and fresh water wetlands and wildlife habitat.

"Authorization of the $1.2 billion IRL South Restoration Project came as part of Congressional approval to develop an even larger, system-wide plan to restore, protect and preserve the remaining Everglades of central and southern Florida," said Mike Rogalski, IRL South project manager. "The larger plan, called the Comprehensive Everglades Restoration Plan (CERP), includes several projects located within the vast Kissimmee-Lake Okeechobee-Everglades watershed, including the Indian River Lagoon. When all of these projects are in place, the health of the Greater Everglades Ecosystem will be dramatically improved."

The interagency effort to produce a project implementation report (PIR) for restoration of the southern Indian River Lagoon has been underway since 1996. The project's purpose is to reverse the damaging effects of pollution and unnaturally large freshwater discharges into these ecologically vital water bodies. The delicate balance of fresh and salt water in the lagoon and estuary will be restored, polluted water will be treated and depleted habitats will be revitalized.

For more information contact the Jacksonville District Public Affairs Office at (904) 232-2568.

Texas marsh rises to new heights

Federal government, project sponsor split cost to rehabilitate declining ecosystem

Bessie Heights Marsh, an immense, freshwater marsh ecosystem that had deteriorated through subsidence of the land and the resulting intrusion of salt water, is on its way to returning to the unspoiled ecosystem of its former days. The Jefferson County Waterway and Navigation District, The U.S. Fish and Wildlife Service, National Marine Fisheries Service, Texas Commission on Environmental Quality (TCEQ), the Texas Parks and Wildlife Department and the U.S. Army Corps of Engineers Galveston District teamed up for the effort.

The marsh is located approximately two miles east of the Neches River in Orange County, Texas, in an area owned by the Texas Parks and Wildlife Department.

The problems of Bessie Heights Marsh, which had lost nearly 90 percent of its original emergent marshes and was regarded as a critically reduced habitat by the Texas Commission on Environmental Quality, was brought to the attention of the Corps in February 2001.

"The lower Neches River delta has experienced the most significant, contiguous loss of coastal marsh of any location in Texas," wrote Richard Seiler of TCEQ in a letter sent to the Corps.

The Bessie Heights marsh loss of wetlands can be traced to an altered water and salinity regime and to subsidence induced by the extraction of groundwater, oil and gas.

These factors, combined with an increase in sea level, played a major role in the loss of marsh in the Bessie Heights area according to TCEQ.

The middle reach of the Sabine-Neches Waterway is the source of the material used for this beneficial use of dredged material/marsh restoration project.

Galveston District performs maintenance dredging in this area on an average of once every seven years. The next cycle was set for February 2003.

The District went to work and factored the dredging cycle and the desperate need for the marsh's improvement into a Section 204, Continuing Authorities Project.

Section 204 provides for protection, restoration, and creation of aquatic and wetland habitats in connection with construction and maintenance dredging of an authorized project.

Approximately 651,000 cubic yards of dredged material were pumped into an approximate 71-acre tract of the Bessie Heights marsh area.

"It's a win-win situation for everyone," said Volker Schmidt, the Corps' project manager. "The sponsor, the local community, the resource agencies and the Corps benefitted from the renourishment actions."

"We enclosed the area, shoring up some of the existing levees to provide for a drainage to the north toward a marsh terracing project belonging to the Texas Parks and Wildlife Department. This allowed the terraces to capture any silt runoff from Bessie Heights," said Schmidt.

Some planting has already been done on the levees, he said. TPWD will continue to monitor the site and when the acreage has dewatered and settled enough for plants to exist, more planting will be done.

Paula Wise, Volker Schmidt and Amanda Schneider have quite a challenge in getting the project through the CAP program process and environmental assessment approval, said Tim Few, who himself worked to get the TCEQ water quality certification and approval to use the adjacent TPWD marsh terrace area to complete settling out of suspended solids.

Providing a key for success through active participation in the design and construction, with assistance in field observation and assessment of the work were Mike Rezsutek, Andy Tirpak and Jim Sutherlin of TPWD.

"Extraordinarily effective cooperation between resource agencies and the District continued throughout the process," said Few. "Still ongoing is the cooperative effort between the District's Jake Walsdorf and Mike Rezsutek, TWPD, in establishing vegetation and turning the site into a functioning wildlife habitat."

Total project cost, according to Schmidt, was $1.2 million. The cost was split 75/25 between the federal government and the project sponsor.

For more information contact the Galveston District Public Affairs Office at (409) 766-3994.

photo by Volker Schmidt

An aerial view of Texas' Bessie Heights Marsh as it now exists. The marsh is on its way to returning to the unspoiled ecosystem of its former days because of the combined efforts of the Jefferson County Waterway and Navigation District, the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department and the U.S. Army Corps of Engineers, Galveston District.

Dredging uncovers shipwrecks from war

By CHRISTINA SWANSON
Jacksonville District

As he jugged through the navy blue water in the small, white survey boat, he could already see that this was something special.

What should have been preparation for a channel dredging turned into an extraordinary historical discovery. The discovery would prove to be one of the highlights of Corps Underwater Archaeologist Tommy Birchett's career, a unique reminder of Puerto Rican history and a significant contribution to understanding 19th century iron shipbuilding.

The U.S. Army Corps of Engineer, Jacksonville District was in the process of preparing to widen and deepen San Juan Harbor's entrance channel in Puerto Rico, through dredging. To satisfy various state and federal statutes, environmental and archeological studies were conducted prior to construction, with the latter locating the remains of two vessels.

Although contractors had previously recorded the time frame of the ships as "modern day," it was Birchett's job to go to Puerto Rico to check out their findings once portions of the vessels were being removed from the channel.

He flew to the Antilles Office, and hopped aboard one of their small survey boats for the short ride to the barge where the remains were being placed. Straining against the sunlight, he examined the 30 foot piece of bow from what appeared to be a very old iron-hulled screw-steamer, and thought to himself that this had to be a "significant historical vessel." His initial thoughts were right.

Hidden for a century-and-a-half beneath the sandy muck and navy-blue waters were the remnants of two special shipwrecks. Site analysis and historical documentation would show that the remains, riveted within the proposed dredging area, represented the *Manuela* and *Cristobal Colon.* In time, after much analysis and research, Birchett and others would learn that they are considered to be the first Puerto Rican losses in the Spanish-American War. Retrieving these shipwrecks also provide uncommon information as to the use of iron-hulled, steam-powered vessels for military strategy and naval control of islands such as the Philippines in the Pacific, and Cuba and Puerto Rico in the Atlantic.

The scuttling of the vessels in an attempt to keep American naval forces out of the harbor reflects the central importance of naval strategies on both sides of the Spanish-American war effort.

U.S. Army photo

The anchor of the Manuela, an early iron-hulled vessel, is removed from the San Juan Harbor channel *The Manuela* and the *Cristobal Colón* were intentionally sunk to block the channel during the Spanish-American War in May of 1898.

"Finding these remnants from the past gives us a glimpse into the Spanish-American War," said Mickey Bonini, State Archeologist, Puerto Rico State Historic Preservation Office (SHPO). "Spain's attempt to block the San Juan harbor by sinking these vessels is an aspect that is not generally known as part of the war endeavor. It is fitting that their remains join the wreck of the blockade runner, *Antonio Lopez,* as National Historic Landmarks named by the National Park Service."

The identities of the vessels were confirmed after much painstaking work. The story begins with the Corps and the Puerto Rican SHPO teaming up to implement a data recovery plan. Several federal statues, including Section 106 of the National Historic Preservation Act of 1966 and the Abandoned Shipwreck Act of 1987, served as a guide to protect and preserve these cultural resources. Led by Birchett, a Memorandum of Agreement was developed and archeological contractors took over the daunting tasks of recording, recovering and redepositioning the vessels that had been sunk in 1898.

Underwater Recording and Tagging

"What made the recording and tagging process exciting was being able to see the remains underwater," said Stephen James, Jr., Head Underwater Archeologist for Panamerican Consultants, Inc. "The waters of San Juan were so clear, unlike many other shipwrecks we have investigated where remains have to be tagged through touch rather than sight, that recording the wreck-

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Shipwrecks

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age was a great pleasure." Working within shouting distance of the famous fortress, El Morro, also preserved by the Corps of Engineers, provided an interesting background to their efforts.

Experienced nautical archaeologists from Panamerican tagged 173 artifacts and wreck components, measured the wreck site, produced a master site plan, and recorded construction details and artifacts in situ on digital video and 35 mm film.

An eerie part of this process was the hundreds of plastic dolls and doll heads that were loosened from the underwater rubble and began to float to the surface. "It became a kind of reminder of past lives lost in the Spanish-American war as the divers collected the doll heads as a means of clearing the area and examining the vessels' remains," said Birchett. Adding to the mystery is what researchers believe was *Manuela*'s secret cargo. Although the *Manuela* was a civilian iron ship tasked to carry cigars, it was also secretly carrying Spanish Remington Rifle ammunition to support Spain in the war.

Identification

Although the vessel's names weren't actually found (and only a few fragments of the *Cristobal Colon*'s hull were found), a significant amount of the *Manuela*'s hull survived. Recording its size, dimensions and type of construction (the overlapped and inverted iron plates proved it was made prior to welding) from site dives helped to pin-point a time-frame for the ship. As recorded by Panamerican, "Construction features noted on both vessels are compatible with mid-to late-nineteenth century iron ship building methods. The most telling characteristics include the riveting on the hull, the use of boilers for steam generation and the presence of a multi-collar type thrust block on the propeller shaft." The recovery of a brass "N" and "L," and machinery and tools from the site also gave clues to the ship's identity.

Many experts were involved in researching information on the vessels from as far away as Scotland. Researchers included Mike Porter, of St. Andrews University in Scotland, who garnered information from the Scottish Maritime Museum and other repositories (because the companies that built them were located in Scotland, the *Manuela* in Renfrew and the *Cristobal Colon* in Greenock); Dr. Charles Pearson who searched the Mariner's Museum in Virginia; Historian John de Bry who conducted archival research at the Archivo Nacional de Cuba in Havana; Armando Marti, ABD, who performed the majority of the on-island archival research; and James who searched the repositories of the Enid M. Baa Library in Charlotte Amalie, St. Thomas.

Removing the Wreckage

As the research continued and all the exposed components of the hull were recorded underwater, Resolve Marine Group had the daunting task of removing the wreckage without further destroying anything. They used a variety of methods including airlifts, clam buckets, chopping (called "guillotining") and rigging to lift individual pieces underwater. As pieces were removed, archaeologists monitored the procedure, sorting through the material collected in the mesh box on the deck of the barge.

Guillotining was used to break up the hull structure into 20 to 30 foot manageable pieces for lifting. Although this was an effective tool to separate the *Manuela*'s hull plating and frames, other features, such as the propeller shaft, had to be cut manually by divers using cutting torches.

Some guillotined sections were too large to be grabbed by the clam bucket and had to be brought up with chains suspended from a crane, once divers rigged individual pieces. The recovery of the heaviest pieces, such as the boilers and stern section was accomplished using a five-part block system, incorporating a large crane and winches.

Close Examination and Recording

The hull remains and artifacts were first placed on land on the southwestern side of Isla Grande for further examination, photo documentation and recording. Key *Manuela* hull elements recorded included a 27-foot long section of the bow, three large sections of the lower hull, a capstan, a windlass, lifeboat davits, hawse pipes, chain and tackle and several anchors.

Other items that offered a good glimpse into the past were brass portholes, rigging elements, ceramics, wrenches, a possible oil lamp box, lanterns and rifle cartridges. About 40 items that would deteriorate quickly out of the salt water environment were sent to the Conservation Research Lab at Texas A&M University to be stabilized and conserved for future museum display.

"A great find was a brass manufacturer's plate associated with a steam pump that not only helped identify the type of ship propulsion used during that time period, but the *Manuela* itself," Birchett said. Research behind the recovery of a George F. Blake steam pump and a brass pressure-test plate from one of the boilers with the words "Lobnitz & Co." provided the most compelling evidence. Looking up the patent dates showed the steam pump would have been manufactured between 1872 and 1897.

Historical research on Lobnitz showed that Blake joined the Henderson yard in Renfrew, Scotland (where the *Manuela* was built in 1872) in 1857 as an engineer and took over the yard by the 1880s. These were decisive bits of information.

Redepositioning as a Recreational Site

As the recordation process came to a close, the redeposition phase of the project began. The overall plan was to preserve the vessels' remains and place the major pieces offshore to create both an artificial reef and recreational diving site. Now having much assurance that these vessels were the *Manuela* and *Cristobal Colon*, it seemed appropriate to select a site near the wreck of the *Antonio Lopez*, considered to be the most significant shipwreck of the Spanish-American War. (She was sunk by the United States gunboat *Yosemite* during a gunrunning operation.)

Birchett and Ricardo Vazquez joined Panamerican archaeologists for an underwater visual inspection of the area and decided that the best place to deposit the *Manuela*'s hull remains would be near the site of the wreck of the *Antionio Lopez*.

"It was an especially clear day, with little turbulence, so we were able to easily view the area underwater," said Vazquez. Several conditions had to be met, such as placing the hull remains at a 50 feet water depth for surge protection, and far enough away from the *Antonio Lopez* so as to maintain the integrity of both sites after nature's disturbances. The appropriate site would also have to be away from coral bottoms so as not to impact any seafloor life, which proved to be more difficult to find than initially thought. After days of searching, a site was found with a sandy/rocky seafloor at 4,300 feet northwest of the *Antonio Lopez* site or seven miles to the west of San Juan. Care had to be taken to ensure that the wreckage pieces would be placed in relation to one another as they had been discovered.

Birchett looks forward to the final step in the process—presenting those 40 conserved artifacts from the ships to the SHPO. "I feel a great sense of accomplishment having played a part in the discovery, recovery and investigation of the Manuela and Cristobal Colon," said Birchett. "It's satisfying to know that the Puerto Rican people and visitors can now learn from and enjoy the vessels' remains, a silent reminder of a once-forgotten page of Puerto Rican history."

For more information contact the Jacksonville District Public Affairs Offcie at (904) 232-3065.

Army NPL site proves challenging

By VERDELLE LAMBERT
Savannah District

You can't remediate what you can't find, and when contaminants are dispersed in complex hydrogeological settings like karst, the task can be overwhelming.

That's the challenge facing the Corps' Savannah District and its contractor, Shaw Environmental, Inc., at Operable Unit 10 (OU-10), the worst of 18 Operable Units EPA has identified for remediation at Redstone Arsenal.

The Army National Priorities List site is a 38,000-acre facility near Huntsville, Ala. It sits atop a thick sequence of carbonate rocks called karst, which, through weathering, have formed more than 13,000 sinkholes, 20 enterable caves, and 424 springs.

During World War II, the military manufactured conventional, chemical and incendiary munitions at Redstone Arsenal. From 1949 to 1996 the Army developed rocket propellants (perchlorate) at OU-10, which is a 1,980-acre area within Redstone. Standard investigations conducted there from 1998 through 2001 indicated the presence of extensive perchlorate and trichloroethene (TCE) plumes and solvent-based DNAPLs (Dense, Non-Aqueous Phase Liquid) in the soil and water at levels that make the groundwater unacceptable for drinking water.

"The mission of the Installation Restoration Program at Redstone Arsenal is to ensure that the facility is available for military and civilian uses with regard to human and ecological health," said John Blandamer, Redstone Arsenal technical lead. "We will determine which areas are contaminated, whether they present a risk to human health or the environment and, if they do, clean them up to safe levels for their intended use."

Over the last two years Shaw Environmental has conducted a holistic investigation to find out where the contaminants are, how they move from one place to another within the bedrock, and where they may move in the future. The results will help identify remedial alternatives and determine the lateral and vertical limits of remediation, according to Wes Smith, Savannah District's project geologist.

It will take Shaw Environmental a year or so to fully interpret the data. Early results show that the DNAPLs have formed a complex set of commingled plumes at various depths and "compartments" within the karst groundwater flow system. There is evidence that the compartments are hydraulically interconnected in a very dynamic fashion, allowing contaminants to travel long distances in a very short time. Evidence of highly dynamic groundwater-surface water interaction also exists.

"These DNAPLs are really hard to find in the subsurface and really hard to remediate," said Thomas F. Zondlo, senior hydrogeologist with Shaw Environmental. "The groundwater plume concentrations that form when water passes over the DNAPLs are easier to locate. But unless you get rid of the source material, the DNAPL itself, you're never going to walk away. It's going to be a very expensive, long-term proposition. What you want to do is remediate the DNAPLs, and what we have found from this investigation is that it's probably going to be impossible to locate all of the DNAPLs, which means it's going to be pretty much technically impossible to remediate some portions of the site. That's called TI, technical impracticability."

The data indicate that any karst cavity, open fracture, or joint in a rock could be migrating or storing DNAPLs. In fact, investigators found more sources in areas where they thought they had located all of the DNAPLs.

And there were more surprises.

"Normally, you'd think that DNAPLs would move straight down under gravity because they're heavier than water," said Zondlo. "But we found that the DNAPLs moved long distances laterally from the site. They went down and hit some rock units or features that were horizontally oriented and stair-stepped off 1500 to 1800 feet from the source areas following the slope or surface that it hit. That was a real finding."

"Based on what we found out here, we will be able to demonstrate to the regulators— EPA and the Alabama Department of Environmental Management — that although we can remediate some places, it's impracticable to remediate in other cases," said Juana TorresPerez, the district's technical manager for Redstone. "We would also have to convince the regulators that the areas we cannot remediate do not pose a human health risk." Because OU-10 is near the property boundary line, there is the potential for contaminants to migrate offsite into the community.

The district will first submit a written report of their findings to the regulators and then begin the feasibility study, where the different alternatives for remediation will be presented.

The district will investigate all 18 operable units at Redstone Arsenal.

For more information contact the Savannah District Public Affairs Office at 912-652-5758.

Abandoned Mine Lands Workshop set for July 13-15

By KATE WHITE
Engineer Research and Development Center

People attending the fifth U.S. Army Corps of Engineers Abandoned Mine Lands (AML) Workshop July 13 to 15 will have the opportunity to visit two abandoned copper mines in Vermont, the Elizabeth and Ely Mines.

The tour is just one part of the workshop set for the Corps Cold Regions Research and Engineering Laboratory in Hanover, N.H.

The special emphasis for the workshop will be on mine pool modeling and partnering. The workshop will provide an overview of current technology in coal and non-coal remediation; briefings by representatives from the Office of Surface Mining, EPA, and the U.S. Forest Service on the Appalachian Clean Streams Initiative, implementation of Total Maximum Daily Loads for pollutants in rivers, and presentations by Districts on Corps AML experiences.

"The most rapidly developing area of environmental restoration in the Corps is that of abandoned mines," said Michael Klosterman, the Corps chief geologist.

"Attendees will help set the course for the Corps environmental activities in the 21st century," he said.

Past workshops have provided attendees with an opportunity to discuss technology, planning, policy, and partnering issues, along with technology demonstrations in the field.

The workshop will be held at the CRREL, 72 Lyme Road, Hanover, N.H. Contact Dianne Nelson, (Dianne.M.Nelson@erdc.usace .army.mil) if interested in attending the workshop.

For more information contact the ERDC-CRREL Public Affairs Office at (603) 646-4292.

Training requirements for hazardous waste

By MARK J. FISHER
Hazardous, Toxic and Radioactive Waste Center of Expertise

What is not known or, often times overlooked, about Hazardous Waste Operations and Emergency Response (HAZWOPER) is that it was written to protect workers performing three very different hazardous waste activities.

Occupational Safety and Health Administration's HAZWOPER standard (29 CFR 1910.120) covers hazardous waste site cleanup operations, operation of Resource Conservation and Recovery Act (RCRA) permitted Treatment Storage and Disposal (TSD) facilities and, hazardous substance spill emergency response.

Each of these activities has unique safety and health hazards and accordingly, worker training for each activity has to be unique in order to teach or refresh workers about how to work safely while performing their "hazardous waste" jobs.

Not all HAZWOPER courses are the same even if the duration requirements are and, it is not acceptable policy to substitute HAZWOPER training courses unless course content is relevant to the employee's job.

USACE organizations could benefit by evaluating their "hazardous waste" activities, applying the appropriate sections of HAZWOPER and modifying HAZWOPER training policies accordingly. USACE organizations should make use of the following activity-specific recommendations when evaluating and modifying their HAZWOPER training programs. Documented support for these recommendations can be found in ER 200-2-3 and EM 385-1-1.

Hazardous Waste site investigations and remedial action. Employers should assure that personnel in the training program are involved with investigating or cleaning up hazardous waste sites and that their work will cause or potentially cause exposure to contaminants. Also they must assure that these personnel have attended 40 hour initial training and that they remain current with their eight-hour annual refresher training requirement. Employees must attend an eight-hour refresher course before performing on-site work that may cause exposure if they fail to maintain the annual refresher requirement. 40 hour initial training must be repeated if employees fail to attend eight hour annual refreshers for three consecutive years.

RCRA permitted TSD facilities and temporary storage of hazardous waste. Employers should assure that employees in the training program are required to handle, store or treat hazardous waste at an operating facility. 24-hour initial training and eight hour annual refresher training requirements apply to RCRA permitted facilities. Facilities that do not have a RCRA permit but temporarily store hazardous waste must provide initial and annual refresher training as per 40 CFR parts 262.34(a)(4) and 265.16, but the applicable regulations do not specify a time limit for either. In either case, whether at a permitted facility or a temporary storage facility, the training must be designed to address the facility specific issues associated with handling hazardous waste.

Hazardous substance spill emergency response. Train only the employees who are responsible for performing hazardous substance emergency response duties and, train them to the level necessary to fulfill their emergency response participation roles at the facility where they work. (e.g. fist responder awareness, first responder operations.). Note that USACE requires organizations to receive special authorization from the district commander or facility director if they intend to respond to spills at a level above and beyond first responder operations. There are initial and refresher training requirements at all levels of emergency response participation. See the requirements specified in 29 CFR 1910.120 (q) for details. Note that there are no training duration limits specified for initial awareness level training or for emergency response refresher training at any level. Initial first responder operations level training has an eight-hour hour duration requirement.

In summary, the HAZWOPER training requirements are very specific to the type of hazardous waste function you perform at your facility. Employers should look closely at their specific hazardous waste responsibilities and choose the appropriate HAZWOPER training in order to meet their needs for their employees.

U.S. Army photo

HAZWOPER emergency response refresher training at the USACE Cold Regions Research Engineering Laboratory (CRREL) in New Hampshire. Employees at CRREL are rehearsing their emergency response plan with local emergency responders.

Corps celebrates Earth Day with Harsha Lake activities

By LINDA ROMINE
Louisville District

A national effort to make America beautiful brought Earth Day volunteers together at William H. Harsha Lake to do their part.

The William H. Harsha Lake staff, in southwest Ohio, joined 145 other volunteers to participate in two Earth Day events.

Dave Zagurny, Park Manager, and James Hughes, Maintenance Mechanic, joined other volunteers in cleaning up William H. Harsha Lake and East Fork State Park for this year's East Fork Riversweep.

"Riversweep has been taking place for almost 12 years. Attendance was good this year, but it had been better in previous years," said Zagurny, "The amount of volunteers depends on things like weather and activities."

Those who showed up were ready and willing to work, including the lake staff who contributed in different ways.

Zagurny operated the Corps Jon boat, using it as a make shift trash barge. Volunteers used canoes to make their way to the hard to reach areas of the shore line bringing back the bags of trash they collected to the Jon boat.

While Zagurny fed the spirit of the day, Hughes' contribution involved feeding the hard-working and hungry workers.

Hughes cooked more than two hundred hamburgers and hot dogs.

This event was part of a larger, countywide effort called Clermont Clean and Green.

On this special day, more than 650 people worked to make their neighborhoods and parks safer and more beautiful for all to enjoy.

While some volunteers were working to clean up the environment, others were working to educate visitors to the Earth Day celebrations.

In addition, Linda Romine, Park Ranger, staffed a booth at an Earth Day Celebration at the University of Cincinnati's Clermont College.

Romine created a table top display that incorporated the Army Theme of "Preserving our Environment while Protecting our Freedom" with the Earth Day theme of "Catch the Urge to Emerge" in celebration of this year's highly anticipated periodic cicada emergence.

What Romaine's display caught was the interest of the people walking around.

More than 150 children and adults visited the Corps' booth to discover what is emerging at their local parks and learn about how the Corps of Engineers protects rare species such as the prairie trillium and potato dandelion.

The Corps' booth may have focused on parks and flowers, but visitors found the programs about flowers just began to scratch the surface of the programs available.

Other activities included programs about birds of prey, fossils and trilobites, animal adaptations, and bird identification.

The event also included environmental art contests, and booths about recycling, water pollution, animal tracking, and nature crafts.

In all, approximately 300 people celebrated Earth Day by learning about caring for the environment.

For more information contact the Louisville District Public Affairs Office at (502) 315-6769.

Dredging

Continued from Page 1

gent upon availability of necessary approvals.

"The dredged material has undergone physical analysis, in coordination with state and federal resource agencies," Walsh said. The dredge material is clean sand and it is the Corps' determination that it is suitable for either unconfined open water or near shore disposal.

"The Corps of Engineers is pursuing approval from the federal and state resource agencies to dispose of the dredge material at a near shore disposal site in sub-tidal water on the west side of the island, adjacent to Charleston Beach," Walsh said. "This disposal site provides the benefits of keeping the clean sand material within the Chareleston Beach system as well as accommodating both the Currituck and private mechanical dredging equipment."

Alternate disposal options that have been considered for this work include open ocean disposal and upland disposal.

"The Corps favors the near shore disposal option because it would keep the sand dredged from the Great Salt Pond channel within the Charleston Beach system," Walsh said. Additionally, the proposed disposal area will accommodate both theCurrituck and private mechanical or hopper dredging equipment. The proximity of the proposed disposal site to the dredging area makes this alternative cost-effective.

The proposed work consists only of maintenance, involving previously dredged areas, and will not affect any cultural or archaeological features or resources. It is the Corps' preliminary determination that no threatened or endangered species occur in the dredging area; however, several threatened and endangered species have the potential to occur near the disposal area. Therefore, the Corps will consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to ensure that the proposed activity will not significantly affect any species or critical habitat designated as endangered or threatened pursuant to the Endangered Species Act of 1973.

The Corps has determined that the dredging could have a temporary adverse effect on Essential Fish Habitat. The dredging and disposal sites are contained within areas designated Essential Fish Habitat for federally managed fish species. The Corps has assessed the effects dredging is likely to have on Essential Fish Habitat, and has determined that there will be no significant impacts on the designated fisheries resources. The Corps will consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to ensure that all impacts will be minimized and would not significantly affect these resources. An application for Water Quality Certification will be submitted to the Rhode Island Department of Environmental Management along with a request for the state's concurrence with the Corps' determination of federal consistency with the state's approved coastal zone management program.

The proposed work is being coordinated with the following federal, state and local agencies: the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Rhode Island Coastal Management Resource Council, the Rhode Island Department of Environmental Management, the Rhode Island Historic Preservation and Heritage Commission, the Town of New Shoreham Harbor Master, and the New Shoreham Town Manager.

For more information contact the New England District Public Affairs office at (978) 318-8264.

Corps funds project to help protect tap water

By JOANNE CASTAGNA
New York District

The U.S. Army Corps of Engineers New York District is presently funding the Frost Valley YMCA Model Forest project, in Claryville, N.Y.

I personally recall as a teen, spending an enjoyable week at the Frost Valley "Y" as part of a school trip. I couldn't agree more with their motto, "More than a place – a life-long experience."

I hiked the breathtaking site that sits on 6,000 acres of high peak land in the Catskill Mountains and drank from the streams that are part of the New York City Watershed System that provides drinking water to New York City residents and businesses.

According to Douglas Liete, project manager, New York District, the water is potentially vulnerable to non-point source pollution caused by foresting methods and over 75 percent of the watershed is forested.

"Non-point source pollution is contamination that is not directly placed in water," said Liete. "For example, in areas where timber is being harvested, rain can wash erodable sediments that contain nutrients, such as phosphorus, from the forest roads into mountain streams and eventually reservoirs. Algae can feed off these nutrients and deplete the water's oxygen, adversely affecting the quality of the water."

"There are improved techniques for timber harvesting that can reduce the chance of non-point source pollution," he said.

These improved techniques can be learned through public education. In 1998, under the Corps' New York City Watershed Environmental Assistance Program, the Frost Valley YMCA was chosen to be one of several watershed locations to host a model forest or a "living classroom." The program serves two purposes – to educate forestland owners about how to implement voluntary practices to prevent non-point source pollution during timber harvests and to keep forests working through management and sustainable harvesting so that people can afford to pay their taxes and hold large tracks of land. Large tracts of contiguous forestland prevent forest fragmentation, parcelization, sprawl and development.

The Frost Valley YMCA Model Forest sits on more than 400-acres of the land owned and managed by the YMCA and is visited yearly by 31,000 landowners, foresters, timber harvesters, students, families and YMCA visitors who come to learn techniques that will help them to responsibly manage forested lands without degrading the habitat or water quality.

The model forest officially opened in the fall of 2003 and is continuing to be developed by a team of specialists from various agencies including the Watershed Agricultural Council, the project's manager, Frost Valley YMCA, State University of New York College of Environmental Science and Forestry, USDA Forest Service, U.S. Geological Survey, New York City Department of Environmental Protection, New York State Department of Environmental Conservation, Catskill Forest Association, Cornell Cooperative Extension and is being funded by the Corps' New York District.

As visitors to the model forest are taken on a professionally guided walk through the forest along a two-mile road they can observe educational signs and demonstrations and visit kiosks. Visitors are taken through a series of 16 experimental treatment blocks of land that are approximately 19 acres each that are treated with various silvicultural prescriptions and sustainable forest management techniques that yield economic benefits.

The land is also being used to demonstrate best management practices and to perform ecosystem research projects.

According to Kevin Brazill, Watershed Forestry Program Manager, Watershed Agricultural Council, the best management practices on display at the model forest instruct visitors on how to protect the water while foresting the watershed.

"This can be accomplished through the use of temporary skidder bridges, water bars and culverts," said Brazill. "Three temporary skidder bridges have been installed in the forest so far and they are placed over streams to protect the water from pollution from vehicles. We also show water bars that are sculpted landscape on forest roads created to divert water away from the road so pollution from the road doesn't enter the water.

"Finally, we have culverts that are metal or plastic piping installed beneath a road to channel stream waters quickly and safely off the road into filtered areas.

"In addition, visitors learn why road layout is important during timber harvest and about heavy equipment used during timber harvest and the role a forester, logger, and landowner plays in decision-making."

Visitors are not only shown how to protect the environment but also how to have more profitable forestry through what is termed silvicultural prescriptions or the "art and science of managing a forest for economic benefit, aesthetic values, wildlife enhancement, water quality protection or any other landowner-driven objective," added Brazill.

Several on-going silvicultural prescriptions, such as crop tree release and patch cut are being practiced in the model forest to see what effect they have on the forest.

"Crop tree release involves the removal of all stems in a given area with the exception of a few species with desirable phenotypes and genotypes, `crop trees,' said Brazill. "These crop trees drop their seed on the ground and they take root and grow into a new, healthy forest consisting of the desired species."

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Students walk through the Frost Valley YMCA Model Forest on its opening day in fall 2003. They are freshman and sophomore science students from the New York City School of the Future in Manhattan.

Biologist receives conservation award

Suzanne Hawes, New Orleans District's project manager to the environment, received a National Wildlife Federation Conservation Award in St. Louis on March 13.

The award recognizes individuals and organizations that play leadership roles in protecting and restoring the environment and wildlife.

Suzanne Hawes

The award reads: Over her more than 30 years as a biologist with the district, Hawes has had a major impact on the state's water resources development program, and as a project manager, has helped raise the district's environmental awareness.

Hawes began her career with the Corps at a time when the environment rarely influenced project design, construction or maintenance. As federal regulations changed, she was one of the few who struggled to change the culture of an institution known for being set in its ways.

As a leader on the Louisiana Coastal Area (LCA) Restoration Study team, Hawes chaired many public meetings, then worked with natural resource agency professionals to draft the Coast 2050 report, which has become the foundation for the LCA feasibility studies. Most recently, Hawes worked tirelessly to ensure appropriate focus on and implementation of the 2050 plan.

During her career, Hawes has become the environmental conscience of the district and the bridge between the Corps and the conservation community. She has been a major influence in bringing the district to the threshold of a new era of environmental restoration and to a broader approach to water project design that incorporates sound ecosystem stewardship.

She illustrates by example what a "greener" Corps looks like.

Other awardees included Bruce Babbitt, former secretary of the Interior, the Montanta Wildlife Federation, New York State Attorney General Eliot Spitzer and musician and activist Don Henley.

For more information contact the New Orleans District Public Affairs Office at (504) 862-1914.

Forest

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The saplings are thinned out every 5-10 years with the best trees selected for growth. Over time, as the small trees grow and the original parent trees age, the parent trees are harvested to give the younger trees sunlight, yielding economic benefit to the landowner, while the younger trees grow into merchantable timber.

"Patch cut is another prescription being practiced. "Patch cutting involves cutting all trees from a thin, long acreage along the end of a forest," said Brazill. "This yields a variety of benefits to the landowner including increased `forest edge' to attract deer and various songbirds, grouse, or turkey and this creates a new opening in the forest to enhance new growth for desired tree species along the edge of the forest."

In addition, several ecosystem research projects on water quality and timber harvesting are being conducted in the forests. For example, the SUNY College of Environmental Science and Forestry in cooperation with the U.S. Geological Survey has set up a weir in the forest.

It's collecting data on the nitrate levels, pH, 02 levels, temperature, sediment loads, and macroinvertebrate levels before, during and after timber is harvested to provide scientists an idea of the impact harvesting has on water flowing through the forest.

"The creation of the model forest will never really "end," said Brazill. "The forest road will be completed by the end of the summer of 2004, additional kiosks and interpretive signs are being created and posted and the data collection from the silvicultural prescriptions will continue for several years."

"The partnering agencies on this project are truly great to work with and the end result has been a wonderful place to learn about forestry and conservation of private land. Thousands of school children from New York City come to the YMCA annually and we are confident that the model forest will help them to understand the importance of forested ecosystems as they relate to the water coming from their taps."

For more information contact the New York District Public Affairs Office at (212) 263-9113.

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