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Vortex Marine's *DB Vengeance* working in the Richmond, California entrance channel on a misty July afternoon. Story on page 12.



On the Cover:

Vortex Marine Construction Using *DB Vengeance* At Richmond Entrance Channel Maintenance Dredged Material Is Used for Marsh Creation



Vortex Marine Construction's dredge *DB Vengeance* is an American crane mounted on a 52- by 112-foot barge with a 9.5 foot draft.

Vortex Marine Construction is using the dredge *DB Vengeance*, equipped with a 10 cubic yard Cable Arm bucket on the Richmond, California entrance channel.

The contract number on this project is W912P7-09-C-0005.

The sediment is being deposited into the Hamilton Wetlands Restoration Project – an innovative beneficial use the Corps of Engineers has put into effect in San Francisco Bay.

The Richmond job is to maintain a channel that is 23,500 feet long and an average of 600

feet wide. Despite its size, the project only includes 150,000 cubic yards of material and another 100,000 of possible overdepth material, because the depth of the siltation overall is not that great, explained Dave Doak, San Francisco District Senior Project Manager for the Richmond job.

The dredge is loading into two 3000-cubic-yard closed hopper barges for transport to the *Liberty Offloader*, which is moored 10 miles from Richmond and five miles offshore from the Hamilton Wetlands.

Weststar Marine Services of San Francisco is the towing company, and Vortex is using its tug *Lariat*, a crewboat and anchor barge on the project.

This year the Corps made the decision to use the *Liberty Offloader* system for the Richmond entrance channel O&M material and also for the Oakland O&M material.

A joint venture of Manson Construction Company and Dutra Dredging is performing the off-loading, using the *Liberty Offloader*, which Dutra built and has since sold to Montezuma Wetlands. The Hamilton Wetlands Restoration Project (HWRP) is a venture of the California Coastal Commission and the Corps of Engineers to restore traditional wetlands to the San Francisco Bay area.



The Vortex staff for the Richmond maintenance dredge job are, back row, from left, Edwin Enriquez - QC/QA Manager, Pete Rutsch - Chief Estimator/Engineer, Pam Parducci - Accounting Manager. Front row, from left, Tina Rutsch - Contracts Administrator, Ken Lago - Dredge Superintendent, and Eric van Zuthem - Vortex General Manager. Photo courtesy of Vortex Marine Construction.

BUILDING THE PUMPOUT SYSTEM

Description courtesy of Manson Construction

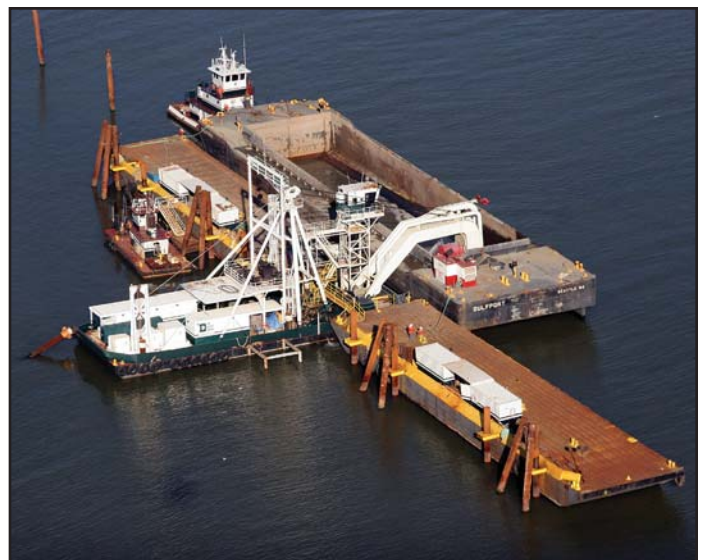
In recent years, in-water disposal has become more and more of an environmental concern in the San Francisco Bay area, and all parties involved have been searching for alternative disposal sites. More than 90 percent of the Bay's marsh and wetlands have disappeared through development.

The U.S. Army Corps of Engineers, in partnership with the California State Coastal Conservancy and the Port of Oakland, have developed the Hamilton Wetlands Restoration Project (HWRP) to address these two environmental concerns. The project takes dredged material from the Ports of Oakland and Richmond and deposits it for beneficial re-use at the now decommissioned Hamilton Air Field in Novato, California. When complete, a total of 547 acres are planned for restoration as wetlands. The HWRP has several planned elements, including tidal wetlands, seasonal wetlands, upland ponds, upland grasslands, tidal ponds, tidal pannes, a wildlife corridor, an intertidal channel and a mudflat area.

Developing a pump off system to deposit the dredged material at the HWRP posed



The *Super Booster* was built specifically for this project, and contains two booster pumps placed back to back, with control house and all supporting electrical equipment. Mark DeFeo/Aerialson demand.com



The *Liberty Offloader* pumps material from a scow at the mooring site in San Pablo Bay, five miles from shore. Mark DeFeo/Aerialson demand.com



At the Hamilton Wetland site, material is pumped into seven cells to create the proper elevation for a marsh. The hangars in the foreground, from the former Air Force Base, have been converted into office space. Photo: Mark DeFeo/Aerialsondemand.com

commissioned in December of 2007, and began handling the material dredged by clamshell dredges *Njord* and *Valhalla* in the Port of Oakland. The material is placed in dump barges and towed approximately 17 miles to the HWRP site. The *Liberty Offloader* dilutes the dredged material, draws the material out of the barge and pumps the material to the *Super Booster*. The two booster pumps push the material the remaining 3½ miles to

numerous problems for the Manson/Dutra Joint Venture (MDJV). First, because of water depths in San Pablo Bay adjacent to Hamilton Field, MDJV was forced to place the primary offloader five miles offshore of Hamilton Field, where there was sufficient water depth for the loaded dump barges. Additionally, the HWRP site itself is over two miles long, requiring a system that can pump dredged materials more than seven miles.

To pump material this distance, MDJV designed a system that included the *Liberty Offloader*, the *Super Booster* and a shore booster. The *Super Booster* and shore booster were built from the ground up in Dutra's Rio Vista yard. It consists of two booster pumps placed back to back, with control house and all supporting electrical equipment. The shore booster is a single variable-speed pump. The Super Booster was placed approximately 1½ miles inshore of the *Liberty Offloader*. Once, again, placement was dictated by water depth, as permit conditions did not allow the barge to sit on the bay bottom.

Air quality concerns dictated that all major pieces of the offloading and pump off equipment be run by electrical power. MDJV had to design, permit and build an 115kv substation at existing PG&E high voltage transmission lines 2½ miles away from the shore booster site. In order to power all the equipment, MDJV ran 2½ miles of overhead power line, and nearly nine miles of submerged power cable to feed the *Liberty* and the *Super Booster*.

MDJV used 24-inch-diameter pipe to build the discharge pipeline. Fifty foot sections of pipe were trucked to Dutra Fabrication in Rio Vista, and welded into 1,000-foot strings that were launched into the Sacramento River and towed approximately 50 miles to the HWRP site. In all, 25 pieces, 1000 feet long were delivered. These pieces were fitted with bell and ball joints at each end to allow for assembly at the site. Another 2,500 of pipe was assembled on shore to get material to the back of the site.

After nearly a year in design, development and construction, the pump off system was

shore, where the shore booster pushes it to the back of the site.