

Dominion Cove Point LNG, LP

Fresh Water Marsh Restoration Project

Description

The pier facilities located a mile offshore in the Chesapeake Bay at the Dominion Cove Point LNG, LP facility in Calvert county Maryland, were upgraded in 2010 to enable safe and efficient unloading of the most technologically advanced liquefied natural gas (LNG) transport ships.

To beneficially use the dredge materials of the project, Dominion suggested and was permitted for the strategic placement of the dredge materials to provide environmental habitat protection.

Purpose

The Cove Point Marsh located in Calvert County, Maryland is the largest freshwater marsh on the western shore of the Chesapeake Bay (Figure 1), and historically contained over 40 rare, threatened or endangered plant species. Due to its unique blend of geological, hydrological and biological features it is designated a Maryland Natural Heritage Area.

A 2006 Nor'easter storm created a breach in the marsh's barrier beach, allowing direct contact between the brackish water of the Chesapeake Bay and the freshwater of Cove Point Marsh. The breach resulted in an increase in the salinity of the marsh from 2.8 parts per thousand (ppt) to as much as 17 ppt, causing significant damage to this unique environment.

Dominion recommended using the dredged material from the facility's Pier Reinforcement Project to repair the barrier beach breach and allow the Cove Point marsh to return to a freshwater ecosystem.

Process

Dominion worked closely with local, state and federal regulatory and resource agencies, local environmental groups and the local community to design and permit the dredged material area to maximize the environmental benefits. A conceptual model was developed to assist the public in understanding the project concept, and Dominion held open houses and participated in multiple agency meetings to finalize the concept and design.

The dredged material placement site was established by constructing a 2500-foot long stone revetment along the shoreline to protect the dredged material from the tidal and

wave action of the Bay, and by sealing the breach with sand through the creation of a dune to separate the dredged material from the Cove Point Marsh. Dredged material was then placed behind the revetment to be planted with salt-tolerant plants creating a salt marsh. The revetment and the newly-created salt marsh protect the Cove Point Marsh, allowing it to return to a freshwater ecosystem. Additionally, a series of segmented breakwaters were installed south of the revetment, and imported sand was used to nourish the beach. The segmented breakwaters and sand were designed to provide habitat for the northeastern beach tiger beetle which is Federally listed as threatened and Maryland listed as endangered, and to protect the area south of the revetment from potential future breaches.

In February 2011, Dominion held a volunteer planting event with the assistance of the National Aquarium of Baltimore to plant grasses on the created dune. The volunteer groups consisted of local school students, community leaders and local community volunteers. The approximately 2-acre dune was planted with American beach grass (*Ammophila bevilgulata*), coastal panic grass (*Panicum amarum*) and Virginia switchgrass (*Panicum virgatum*). The dredged material was stabilized with these marsh plants in May 2011. This created approximately 11 acres of salt marsh. Since the 2011 planting, Dominion and the National Aquarium have conducted planting events annually with local students and these occurred on May 24, 2012 and April 9, 2013. These events have not only benefited the health of the marsh area by increasing the amount of vegetation, but also created valuable learning experiences. The students grow dune grasses in a controlled classroom atmosphere and transplant their grasses to the marsh once they reach maturity. This has given the students an opportunity to directly tie their in-class lessons to real world applications.

Dominion worked with the Providence Center, a nonprofit organization that operates greenhouses and offers employment services to developmentally challenged adults, to grow the marsh plants. The National Aquarium coordinated the volunteer efforts for planting the salt marsh vegetation.

To monitor the return of the Cove Point Marsh from the brackish tidal state to a freshwater ecosystem, Dominion has placed water quality stations throughout the marsh and has embarked on a long-term monitoring program with the University of Maryland Chesapeake Biological Laboratory (CBL). Dominion and CBL continue to monitor the hydrologic and biologic environs of the structures, created habitats and natural habitats and document the findings on an annual basis. The report for the 2012 activities and study was completed and submitted in July 2013. The report indicated an increase of over 50 % in plant stem density from 2011. Overall the water salinity modeling indicates that activities and design are effective to restore freshwater conditions.

Contributions to the Environment

The Pier Reinforcement Project represented a unique opportunity for Dominion to assist in the preservation and protection of a treasure of the Chesapeake Bay. Dominion used the dredged material generated by the project to maximize the environmental benefit by

preserving a Maryland Natural Heritage Area, and enhancing multiple habitats. Environmental benefits of the project include

- Protection of the Cove Point Marsh Natural Heritage Area,
- enhancement of habitat for the northeaster beach tiger beetle which is Federally listed as threaten and Maryland listed as endangered,
- addition of 3000 feet of hard structure habitat from revetment and segmented breakwaters,
- creation of multiple habitats including 11 acres of salt marsh and 2 acres of beach dune,
- restoration of several vegetative species destroyed by the 2006 storm event; and
- long-term monitoring of the recovery of Cove Point Marsh.

Accomplishment

The Cove Point Marsh is a very unique and delicate area due to its geological and biological diversity. The work that Dominion has completed and the continued maintenance activities, have allowed much of the freshwater ecosystem to be restored. Many rare species that were destroyed during naturally occurring events have begun to reappear, with several flourishing in the rehabilitated environment. The monitoring that is being done by Dominion and CBL allows for analysis of changes in salinity and water levels to proactively manage conditions that may lead to the decline of marsh health

The project has received several awards including the Southern Gas Association (SGA) Environmental Excellence Award in 2011 and the National Environmental Excellence Award for Environmental Management by the National Association of Environmental Professionals (NAEP) in 2012

Pictures

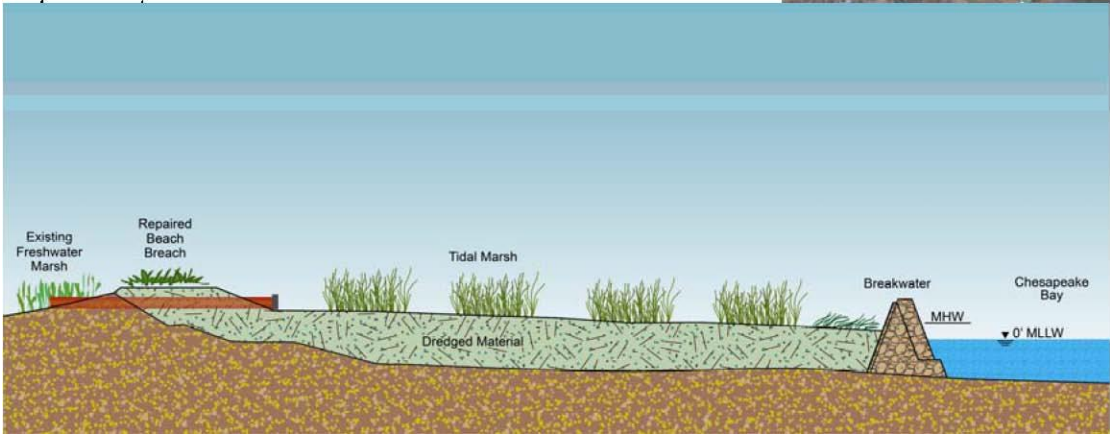




View of breach in barrier beach showing tide and wave action on the marsh in September 2008. Chesapeake Bay is to left in photo.



Conceptual model of revetment and dredged material



Newly-nourished beach with segmented breakwaters in Chesapeake Bay in right of photos.



Dune grass planting during volunteer planting event February 2011.



Current beach photo showing beach plantings and natural growth