

Groundwater Treatment Facility Construction Martin State Airport 2015-2017

Project Photo Tour
Updated April 2017

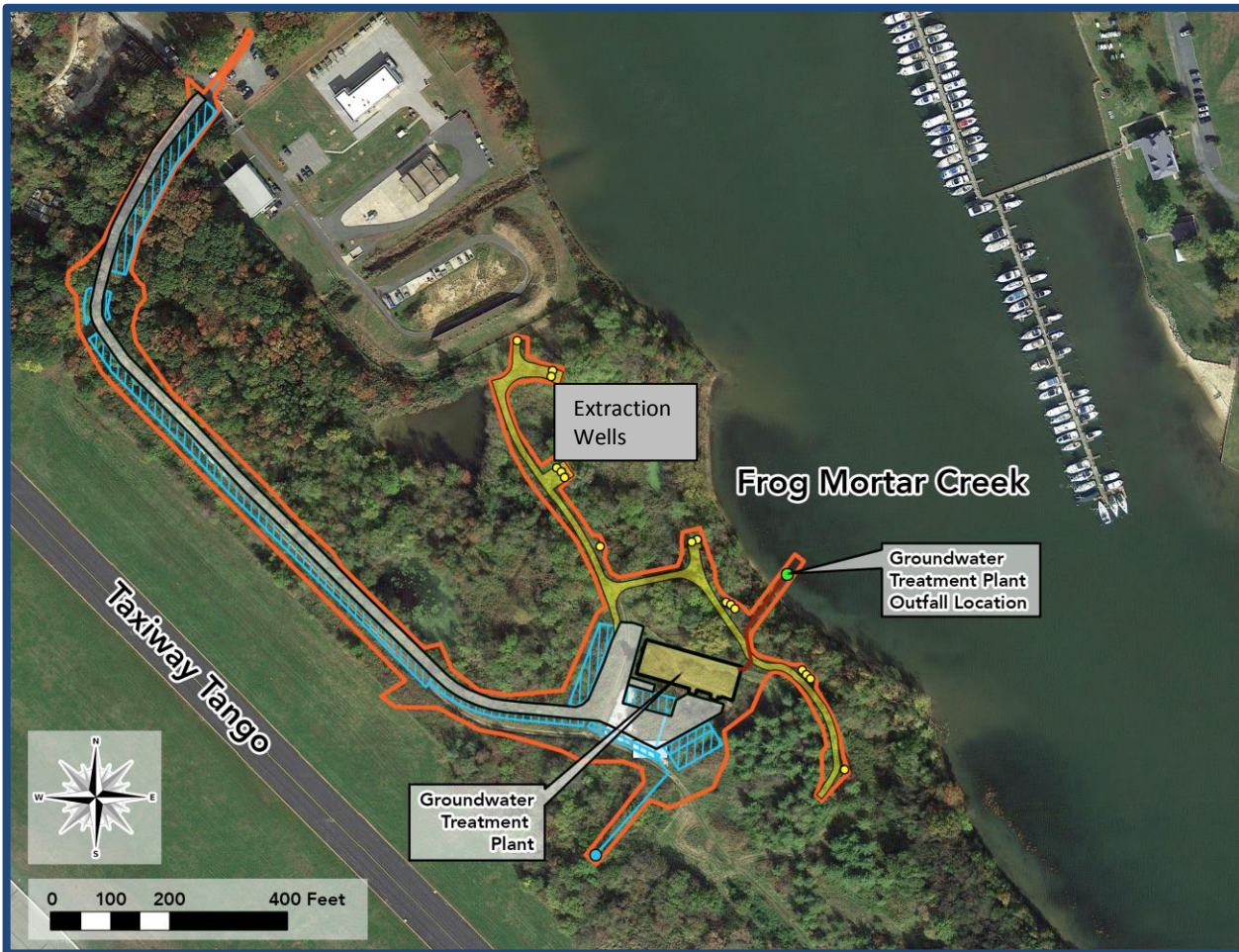


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Groundwater Treatment System

A groundwater extraction and treatment system is under construction on the east side of Martin State Airport. The system consists of 16 extraction wells, underground piping, and a building that will house components to treat groundwater containing volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals at concentrations above Maryland Department of the Environment (MDE) groundwater standards.



Groundwater will be pumped from the wells through underground piping to the treatment building, creating a “hydraulic barrier” which captures groundwater and prevents its contaminants from moving into Frog Mortar Creek. The building is 60 feet wide, 170 feet long, and 36 feet high, and constructed near the creek. Treated groundwater will be tested frequently and will be released to Frog Mortar Creek through an MDE-permitted outfall.

The construction began with clearing trees and debris from the area.



Erosion and sediment control measures protect areas surrounding the work site, in accordance with the MDE permits for construction.



Trees were removed, sediment and erosion control fencing was installed, and gravel was laid for a temporary access road.



Monitoring wells located in the project work area were identified and protected. Prior to well drilling, a decontamination area was installed for cleaning drilling equipment.



Drilling tests were conducted to determine the soil characteristics at each depth in areas where new extraction wells will be located.



The access road was completed. A stream was rerouted with temporary piping and other protective measures until a permanent culvert was installed.



A pre-assembled outfall structure was placed in the creek during the permitted in-water work window (in February 2016). Once operational, the groundwater treatment system will release clean, treated water through three diffusers extending 70 feet from the shoreline of Frog Mortar Creek.



A barge had to break ice to install the outfall in the winter. The outfall area is marked with buoys to alert boaters and keep them at a safe distance.



The outfall piping was laid using protective sediment controls.



An enlarged culvert was installed beneath the main entrance road.



Cast cement pilings were first tested to ensure they had the adequate strength to support the building, then the remaining pilings were installed.



Existing utilities were protected as a new water main was installed. Power for the existing airport's avionics equipment and the future building required installation of a manhole. Electrical conduit piping was laid beneath a temporarily re-routed stream.



Extraction wells were drilled using a sonic rig with a 12-inch outer casing.



Newly installed extraction wells are located close to Frog Mortar Creek and will withdraw groundwater at multiple depths. Shown here are housings for well piping and pumps and interior piping.



Wells are covered by a vault lid. Double-walled pipes will carry extracted groundwater. The piping was field-welded and then pressurized to test for leaks. First, a heating plate was placed between two pipe ends. When the pipe ends started to soften, the plate was removed, and the two ends were pressed together until cooled, and the pipe was sealed.



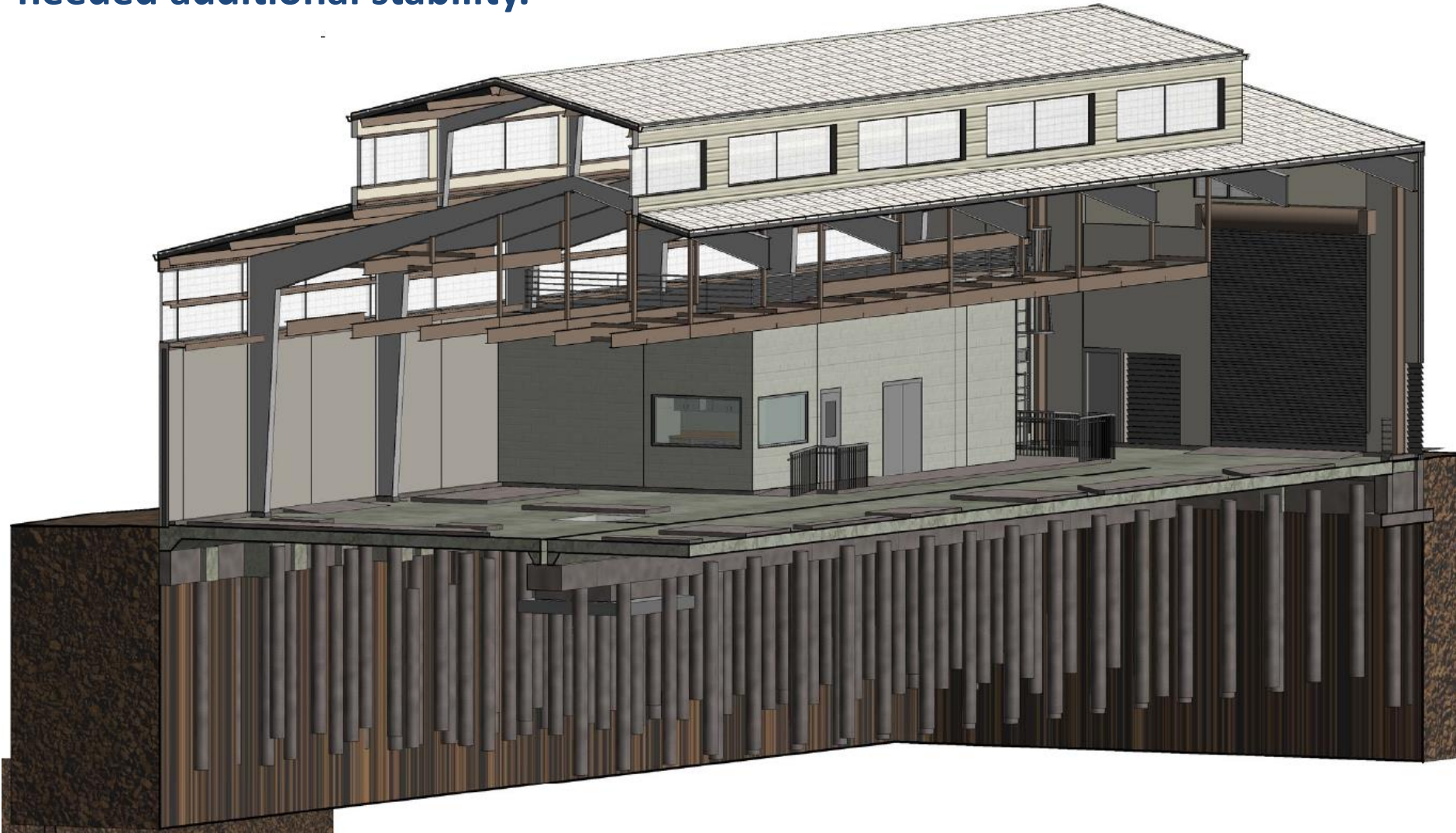
Groundwater extraction pumps are controlled at nearby panels, which are accessible by roads built for operations and maintenance.



New fencing was installed around the treatment system and wells, and a gate allows access to the outfall area.



A conceptual rendering of the groundwater treatment building shows the number of cast concrete pilings (252 total) that support the building's foundation. Since the ground beneath the building is a former dump, it needed additional stability.



Since the groundwater treatment system is being built over a former dump, a three-layer plastic vapor barrier was installed to protect future building occupants and prevent soil gas from entering the building.



The vapor barrier was installed around infrastructure beneath the building, such as the tops of cast piles and steel bars.



Rebar, a steel bar with ridges that reinforces concrete, is installed for the foundation.



A building sump was built of reinforced concrete. With the vapor barrier and rebar installed, the crew installed the concrete floor slab.



Concrete was poured for floors, containment walls at chemical storage areas, and curbing to form a barrier around the building's outer walls.



Once the concrete floors were placed and dry, the building's steel frame was erected. A rack for piping was also installed.



Before the building's walls were put up, the largest equipment (mostly tanks) was brought onsite and installed using cranes and aerial lifts to transfer, upright, and set them.



Jacks were used to lift tanks into position. Felt was installed under the treated water tank, which holds water for release.



Guard rails and ladders were installed for access to the top of the large tanks.



A hardener and sealant were applied to finish concrete floors and containment walls.



A variety of large tanks were installed.



Equalization Tank



Sanitary Holding Tank



Effluent Tank

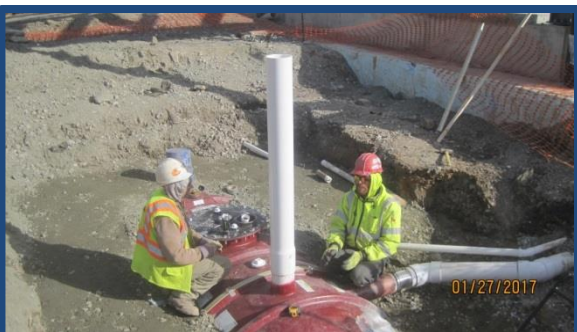
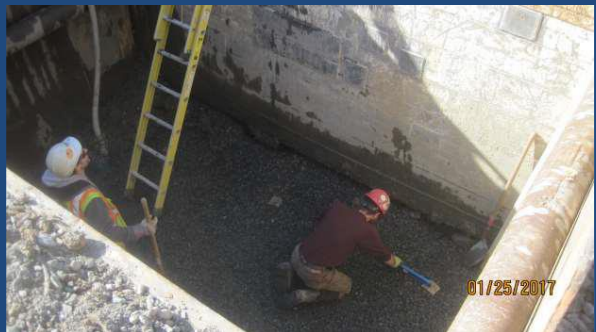


Sludge Holding Tank



Dirty Back Wash Tank

A sanitary holding tank was installed because no sewer line extends to the treatment plant. The tank was placed in an excavation next to the building and a vault cover was placed over it for future cleanouts.



More large equipment was installed and piping work was begun before walls were placed. Tests will follow once all equipment is installed.



Air Stripper and Liquid Phase Carbon Unit



Decant Tank and Vapor Phase Granular Activated Carbon Units



Liquid Phase Granular Activated Carbon Treatment Units



Wall panels were pre-constructed, shipped, then installed.



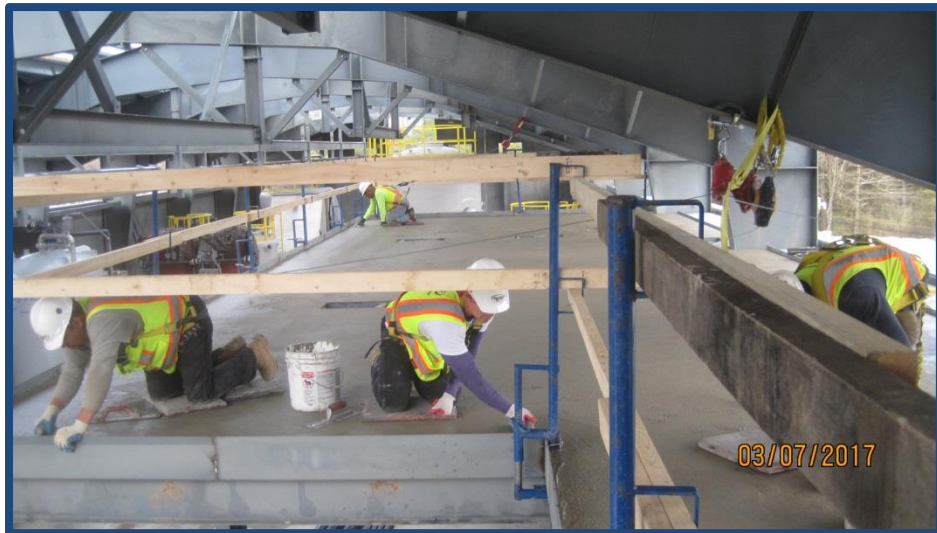
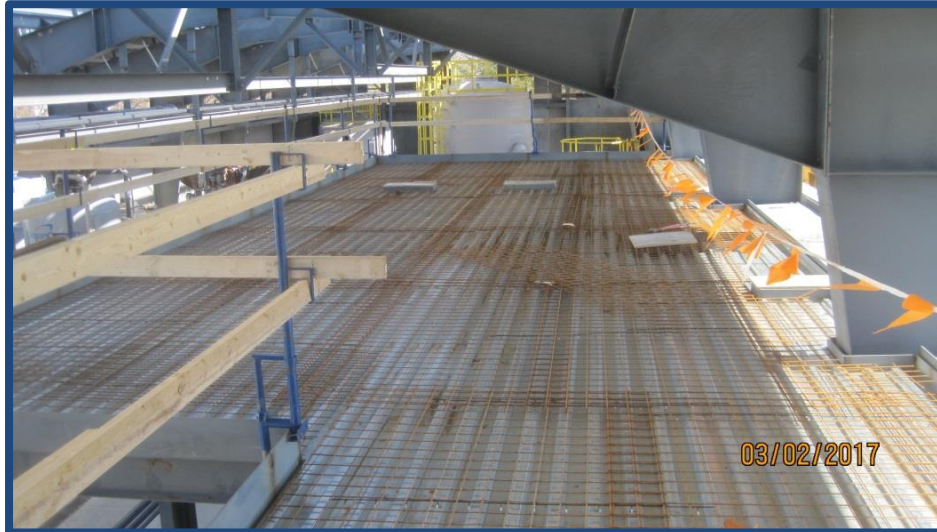
Wall panels were installed.



Roofing panels were installed next.



Inside the building, framing, decking, and a wire mesh topping were installed in preparation for placing the concrete deck of the mezzanine.



Once the building has sealed walls and roofing, construction work inside can proceed quickly. Future photo tours will continue to update the community as the project progresses. Project construction is expected to complete during Summer 2017.



The building continues to be sealed up and translucent panels were installed on the upper levels to allow in natural light.



Interior walls and plumbing are installed.



Process piping and pumps are being installed.



A geo-grid paver system is being installed on the well access roads to create a permeable surface, allowing rain water to percolate through the walkway.



Lockheed Martin wishes to thank the contractors, the regulators and permitting authorities, and the community for its cooperation in helping make this project a success.

**For questions, comments or concerns please contact:
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