



THE CRANEY ISLAND CONNECTION

CRANEY ISLAND EASTWARD EXPANSION NEWS AND INFORMATION

VOLUME 3 ISSUE 4

OCTOBER 2009

Naval Fuel Line Relocation Marks Countdown to Initial Project Construction

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Early construction on a project to relocate two Naval pipelines is underway at Craney Island. The pipelines are being moved to accommodate the Craney Island Eastward Expansion project. The relocation effort marks an important milestone towards initializing eastward expansion dike construction in 2010. Phase one of the relocation—the construction of a berm to house the relocated fuel lines—is nearly complete. Phase two—relocation of the fuel lines—will begin next year. This issue of The Craney Island Connection explores the steps being taken to move the pipelines and how this effort plays an important role in the Craney Island Eastward Expansion project.

BACKGROUND

The Craney Island Eastward Expansion project team is required to ensure utility relocations are performed prior to initial project construction. The Navy's Oily-Waste/Waste-Oil (OWWO) pipelines were identified as the single utility impacting project construction. As a result, the pipelines must be relocated outside the Eastward Expansion project area.

The Navy's pipelines are used to transfer fuel and waste oil between Craney Island Fuel Terminal to the south of Craney Island, and Naval Station Norfolk (NSN), to the east of Craney Island, across the Elizabeth River. The annual transfer volume for the fuel and OWWO lines is between 380,000 and 500,000 barrels. The lines support Naval carrier, submarine, and jet operations critical to our national defense.

At their current location, the pipelines would not be able to tolerate the settlements associated with Eastward Expansion project construction, which includes building perimeter dikes that will create a new cell on the east side of Craney Island. After the dikes are built, the cell will be filled with dredged material mined from the existing dredged material management facility. If the pipelines remained in their current location, project filling would create 20-30 feet of settlement in the new cell that they could not withstand. Therefore, the pipelines will be relocated to the existing eastern dike in a new utility corridor.

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FOR FURTHER INFORMATION OR
ADDITIONAL COPIES CONTACT:

DEJUAN PRICE
TECHNICAL COMMUNICATION
MANAGER

TEL: (757) 628 - 8222
FAX: (757) 628 - 8244

EMAIL: CICONNECTION@CRANEYISLAND.INFO

SUBSCRIBE ONLINE
[HTTP://WWW.CRANEYISLAND.INFO](http://www.craneyisland.info)

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Representatives of the Virginia Port Authority (VPA) and the U.S. Army Corps of Engineers (USACE) have worked closely with the Navy to identify an alternative pipeline location. The group concluded that the most economical solution was to develop a utility corridor located between the existing Craney Island Dredged Material Management Area (CIDMMA) and the Eastward Expansion project area.

Based on conceptual design work for the future marine terminal, project engineers determined that the optimum location for the pipelines would be along the existing east dike in an elevated berm. The berm provides an area where the Naval pipelines can be placed out of the way of the future expansion area. Contractors will bury the pipelines along the eastside of existing CIDMMA. Additionally, elevating the berm will off-set anticipated settlement in the expansion area. The relocated pipelines will reconnect to the existing fuel lines traveling to NSN off the northeast corner of Craney Island.

EAST BERM CONSTRUCTION



Trackhoes Are Shown Along The North End Of The Berm

This summer, contractors began construction on the 8,600 linear foot berm along the existing eastern dike of CIDMMA. It is approximately 175 feet wide, but varies along the project. Contractors mined approximately 800,000 cubic yards of material from the center cell of the existing CIDMMA to construct the expanded berm. CIDMMA's center cell contains the driest and sandiest material best suited for berm construction. Utilizing this material from within CIDMMA represents one major example of the beneficial re-uses of materials that will characterize the Craney Island Eastward Expansion project. By excavating material from within CIDMMA, contractors create additional capacity, thereby extending the useful life of the facility.

The new berm also includes ten stormwater conveyance channels to provide a path for rainwater to flow down the edges and prevent erosion. Experts in the field of establishing vegetation on problematic soils were consulted to assist in specifying a unique seed mix that will enhance grass establishment along the berm. The grasses will be hydroseeded and hydromulched along the berm to stabilize the soil.

NAVAL FUEL LINE RELOCATION PROJECT



Berm construction is expected to be complete by the end of October 2009. A second contract will be advertised to relocate the pipelines from the shoreline into the new berm in 2010.

LESSONS LEARNED

Geotechnical instrumentation has been installed within the berm along the relocated pipeline route to measure construction and post-construction settlement as well as water pressure within the clay beneath the berm. The six clusters of monitoring equipment will replace existing instrumentation at the project site that is now obsolete. The new equipment will be more advanced than the types of instrumentation previously utilized at CIDMMA.



Soundex Instrumentation Installation

In addition to refining settlement predictions used for the Navy pipeline relocation, data produced from the testing provide greater detail on how material within the expansion area will settle during construction.

GEOTECHNICAL INSTRUMENTATION AT CRANEY ISLAND



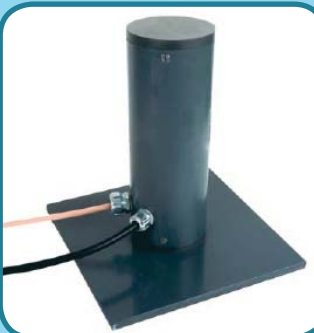
PNEUMATIC PIEZOMETERS are used to measure pore water pressure in saturated soils. Pore water pressure refers to the pressure of groundwater held within a soil or rock, in gaps between particles.



The **VIBRATING WIRE PIEZOMETER** consists of a vibrating wire pressure transducer and signal cable. It can be installed in a borehole, embedded in fill, or suspended in a standpipe. Readings are obtained with a portable readout or a data logger.



The **MAGNET EXTENSOMETER** is used to monitor settlement and heave in excavations, foundations, dams, and embankments. It consists of a series of magnets that are installed with an access pipe. The magnets are anchored at specified depths. Measurements are taken by lowering a probe through the access pipe to detect the depth of the magnets.



SETTLEMENT CELLS are used to monitor settlement and heave in soils. A settlement cell consists of a liquid reservoir, liquid-filled tubing, and the settlement cell, which contains a pressure transducer. One end of the tubing is connected to the settlement cell, which is embedded in fill or installed in a borehole. The other end of the tubing is connected to the reservoir, which is located away from the construction area.

Photos From the Field



A Horizontal Inclinometer was Installed In A Trench To Measure the Settlement Profile of the Berm



Piezometer Installation

Engineers will use the data to refine the analytical methods and assumptions related to Craney Island Eastward Expansion's development. In particular, it will improve the team's ability to plan and manage the project's ground improvement program.

A variety of instrumentation was installed to support the subsurface investigations at the fuel line (see Geotechnical Instrumentation At Craney Island). Many of these instruments were installed up to 160 feet below the ground surface. Some instruments are read manually, while others will automatically transmit their information to the engineer. Project engineers can use the data from the berm to see which instruments may be the most effective to use in monitoring the expansion construction.

CONCLUSION

The Navy OWWO pipelines must be relocated to an elevation of approximately 30 feet to keep them outside the footprint of the project area. Contractors have constructed an elevated berm along the eastern dike of existing CIDMMA to accommodate the pipelines within an alternate corridor. Construction of the berm represents the beneficial reuse of dredged material within CIDMMA and will expand capacity within the facility—one of the main purposes of the Craney Island Eastward Expansion project. Instrumentation installed along the corridor will support the analytical predictions and modeling underway for the Craney Island Eastward Expansion.

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FIRST FEDERAL APPROPRIATIONS FOR CRANEY ISLAND EASTWARD EXPANSION

On September 30th, Congress appropriated \$100,000 towards construction of the Craney Island Eastward Expansion. The project was included in the 2010 Energy and Water Appropriations Bill. Inclusion in this fiscal year's budget will also qualify the project for general construction federal stimulus money.

"This project was authorized in November 2007 and less than two years after that we're able to secure funding; that is incredible," said J.J. Keever, the Virginia Port Authority's (VPA) Senior Deputy Executive Director.

This important milestone could not have been reached without the help of Virginia's congressional delegation. "It says a lot about the effort and commitment to this project put forth by Senators Jim Webb and Mark Warner and Congressmen Bobby Scott and Glenn Nye. A lot of credit and thanks are owed to those people because they were the ones who imparted the importance of Craney Island on their colleagues," Keever added.

"The expansion of Craney Island is critical to both the region's economic growth and national defense," Senator Jim Webb said in a statement. "Today's funding announcement

opens the door to continued federal investment to keep this project on track while also creating jobs in the Norfolk area."

Senator Mark Warner agreed, saying, "The Craney Island expansion is an ambitious and critically important infrastructure project not only for Hampton Roads and Virginia, but for the nation. I am pleased we have been able to turn-on the spigot to federal support for what will be a multi-year effort."

Funding for the Craney Island Eastward Expansion utilizes a combination of Federal and state funds. According to WRDA, the Federal government—through the Army Corps of Engineers—will share 50% of dike construction cost with the VPA. Dike construction is now on track to begin in the summer of 2010.

The Craney Island Eastward Expansion will generate \$6 billion in national transportation cost savings and create 54,000 jobs with wages of \$1.7 billion and local tax revenues of \$155 million. Congressman Glenn Nye pointed out that Craney Island will be the "only major East Coast port facility with the ability to increase its size at will, meaning that this project will provide endless business investment opportunities for the Hampton Roads economy that will create jobs."

THE CRANEY ISLAND CONNECTION
800 WORLD TRADE CENTER
NORFOLK, VIRGINIA 23510

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