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Website: www.coastalengineering.com

April 20, 2015

Mr. Craig Vogt
c/o Western Dredging Association
WEDA Environmental Commission
Craig@CraigVogt.com

Dear Mr. Vogt,

Coastal Engineering Consultants, Inc. (CEC) would like to nominate the Riverine Sand Mining/Scofield Island Restoration Project (BA-40) for the WEDA 2015 Environmental Excellence Award for an Environmental Dredging Project.

Representatives from CEC are registered for and plan on attending the WEDA 2015 Annual Conference in Houston, Texas. CEC is committed to presenting a formal presentation or poster and answering questions regarding the Riverine Sand Mining/Scofield Island Restoration Project, if selected.

Contact: Steve Dartez, CEC Managing Engineer
Phone: (225) 706-5640, Email: sdartez@ceci-la.com

Please find attached the nomination form that includes the requested information. We look forward to the review of the Riverine Sand Mining/Scofield Island Restoration Project. If you have any questions or require additional information please contact me at (225) 706-5640, or by email at sdartez@ceci-la.com.

COASTAL ENGINEERING CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "J. Steve Dartez", written in a cursive style.

Steve Dartez
Managing Engineer

**RIVERINE SAND MINING / SCOFIELD ISLAND RESTORATION
WEDA ENVIRONMENTAL DREDGING EXCELLENCE AWARD
PROJECT SUMMARY**

Executive Summary

The restoration of Scofield Island has achieved environmental dredging excellence because of its use of renewable sand resources through an innovative long distance delivery system for barrier island restoration. A first in our nation's history, the Scofield Island Restoration Project used sand dredged from the Mississippi River to restore critical Louisiana barrier island habitat. The location from where the sand was dredged is one of the busiest commercial stretches on the lower Mississippi River voyaged daily by supertankers and barge traffic. The dredge pipeline corridor that connected the borrow area in the River to its destination on Scofield Island stretched approximately 22 miles, negotiating over hurdles and under obstacles along its way! At the outset of the Project, stakeholders from navigation companies expressed concern about dredging activities negatively impacting navigation. However, during construction of the Project the stakeholders lauded the Project team's outreach effort as one that should be modeled by other restoration projects in Louisiana.

Scofield Island is located west of the active Mississippi River bird's foot delta in Plaquemines Parish, Louisiana. It is a 2.4 mile long barrier island located between Scofield Bayou and the merger of Bay Coquette and the Gulf of Mexico, Plaquemines Parish. The island is a critical component of the State of Louisiana's Master Plan for restoring and protecting the fragile ecosystem within the Barataria Basin. Scofield Island has experienced substantial impacts from storms, relative sea level rise, and anthropogenic influences. Scofield Island was restored using approximately 3.4 million cubic yards (MCY) of sandy material from the Mississippi River to create and restore 640 acres of island habitat: approximately 150 acres of supratidal habitat and 360 acres of future intertidal habitat. The approximate 640 foot wide beach and dune, supported by sand fencing, were constructed to elevations of +4 and +6 feet NAVD88, respectively, along 12,700 feet of Gulf shoreline, utilizing over 1.9 MCY of sand. The approximate 1,000 foot wide marsh platform was constructed to an elevation of +3 feet NAVD88, utilizing over 1.5 MCY of sediment. The platform is expected to settle and compact to healthy marsh grades within the first three years. The dune and marsh will be planted with native vegetation during the next planting season.

The Scofield Island Restoration Project restored the geomorphic and ecological form and function of this critical barrier island habitat. In its course from the borrow area to the beach, the dredge discharge pipeline crossed over the Mississippi River Flood Protection Levee, under two state highways beneath which permanent pipeline casings were constructed, over the Hurricane Protection Levee, through a 10 mile portion of the Empire Waterway navigation channel, exiting into the Gulf of Mexico, and eastward until finally Scofield Island was reached. Construction required establishment of six navigation crossings and utilization of four booster pump-out areas. **This is one of, if not *the*, longest sediment delivery systems ever to be implemented in the United States for coastal ecosystem restoration.**

Project Description:

- **Engineering & Design Sponsors:** Coastal Protection and Restoration Authority, Coastal Wetlands Planning, Protection and Restoration Act Program with NOAA Fisheries (federal sponsor)
- **Construction Sponsors:** Coastal Protection and Restoration Authority (non-federal sponsor) with BP funding
- **Engineer:** Coastal Engineering Consultants, Inc. (WEDA member and nominating entity)
- **Construction Contractor:** Great Lakes Dredge and Dock Company, LLC (WEDA member)
- **Dredges:** Cutterhead Dredge California, Cutterhead Dredge Alaska and 3 booster pumps.
- **Construction Duration:** July 26, 2012 – October 18, 2013
- **Location:** Plaquemines Parish, Louisiana
- **Area Restored:** The beach and dune were approximately 640 feet wide along 12,700 feet of Gulf shoreline, utilizing over 1.9 million cubic yards (MCY) of sand. The marsh platform was approximately 1,000 feet wide, utilizing over 1.5 MCY of mixed sediments.

Introduction

In Louisiana, Scofield Island and other barrier islands are important ecological communities that play a critical role in mitigating the impacts of Gulf of Mexico storm events on adjacent wetlands and coastal communities in Louisiana. The shallow bays behind barrier islands and headlands offer protection from the high-energy wave action of the open Gulf of Mexico, providing a habitat for the best oysters in the nation. The oyster reefs in the Gulf of Mexico represent the largest, most sustainable oyster reefs in the world, accounting for nearly 70% of the total national catch and producing oysters with flavor and texture that cannot be substituted or replaced. Louisiana barrier systems are considered the “first line of defense” from a coastal protection and restoration standpoint.

The Scofield Island Restoration Project is not only a great achievement of engineering and dredging; it also demonstrated that the Mississippi River is a superb, viable resource for high-quality sediment that is usable, abundant, and renewable. No project better represents the progress, completion, and new beginnings of the post oil spill efforts in Louisiana than the Scofield Island Restoration Project.

Environmental Benefits

The environmental benefits of the restoration of Scofield Island were the creation and nourishment of over 640 acres of beach, dune, and marsh habitats using a renewable sand resource from the Mississippi River. In Louisiana, Scofield Island and other barrier islands are important ecological communities that play a critical role in mitigating the impacts of Gulf of Mexico storm events

on adjacent wetlands and coastal communities in Louisiana. The protected bays and marshes behind the barrier islands provide essential nursery and foraging habitats for many species of both commercially and recreationally important fish and shellfish, as well as numerous species of waterfowl that utilize the Mississippi Flyway.

The barrier shoreline at Scofield Island experienced an average gulf-side erosion rate of 29 feet per year between 2000 and 2008. Wetlands, dune, and swale habitats within the island have undergone substantial historic loss due to pipeline construction, geologic subsidence, sea level rise, and marine/wind-induced erosions. The combined effects of these factors have caused

landward transgressions of the shoreline and more recently, island breaching and breakup. In an effort to restore Scofield Island's geomorphologic form and ecologic function, the State of Louisiana and the National Marine Fisheries Service initiated the Riverine Sand Mining/Scofield Island Restoration Project with funding through the Coastal Wetlands Planning, Protections, and Restoration Act (CWPPRA).

The Scofield Island project was the first project in Louisiana to use sand from a renewable resource, the Mississippi River, to restore barrier island habitat. The Project team negotiated significant hurdles and obstacles in the planning and design phase to create a conveyance corridor that could be utilized for this Project and others to follow. The planning, design, permitting, and construction of the Project confirmed the viability of using a renewable sand resource from the Mississippi River to restore barrier island habitat through a long distance pipeline corridor. With limited offshore sand resources available for future barrier island restoration projects in Louisiana, the dredging of sand from the Mississippi River to restore Scofield Island provided a tangible proof of concept.

The unique environmental challenges that were addressed by this Project were the creation of critical barrier island habitat in a dynamic environment using a unique sand resource in a region that does not have significant offshore sand resources. The dynamic environment includes the active socio-economic conditions of the area, which include the borrow area being located in one of the most active stretches of the Mississippi River; the conveyance corridor which crossed a Mississippi River levee, 2 state highways, a Hurricane Protection Levee, a harbor that is one of the busiest commercial fisheries ports in the nation, and traversed the Empire Waterway which connects the port to the Gulf. Tremendous outreach by the Project team reduced the potential for conflict among stakeholders and interested parties, achieved consensus, and resulted in successful Project implementation.

Preliminary planning work began on the Scofield Island Restoration Project in 2004. On April 20, 2010 the Deepwater Horizon Oil Spill changed everything. Scofield Island sat in the path of oil coming ashore from the disaster. The Louisiana National Guard aurally dropped huge sand bags to plug breaches in the island and prevent oil from penetrating and harming vulnerable marshes. The oil spill created the need for an emergency deposit of sand on the island to serve as a protective berm against oil potentially intruding the delicate marshlands. The sand placed on Scofield Island as part of the berm project provided a foundation for the restoration project that would be constructed three years later.

Innovation

The leadership shown during the Project began from the outset, when the concept was developed to use sand resources from the Mississippi River to restore Scofield Island through a long distance sediment conveyance pipeline. To that date, a long distance sediment pipeline had not been utilized for barrier island restoration in Louisiana. The traditional approach to barrier island restoration at that time was to dredge nearshore and offshore sediment resources, which had been depleted over the years.

The uniqueness of the Riverine Sand Mining/ Scofield Island Restoration Project is highlighted by the obstacles that the design team and contractors had to overcome in connecting a renewable borrow area in the Mississippi River to the island. A variety of alternatives were evaluated during the feasibility phase to determine the most efficient conveyance corridor from the river to the island based on technical, environmental, institutional, and fiscal parameters. Obstacles during the design phase included:

- Identifying sand resources and quantifying potential impacts of mining on river hydrodynamics.
- Consideration of culturally significant resources along a stretch of the river which was just downriver from the location of a major Civil War Battle in 1862.
- Detailing and coordination of a 22-mile pipeline conveyance corridor which crossed the Mississippi River levee, two state highways, a hurricane protection levee, oil and gas pipelines, and traversed the Empire Waterway.
- Installing and operating an integrated dredge, pipeline, pump system that was powered by a cutterhead dredge in the Mississippi, a second cutterhead dredge that was used as a booster, and 3 other in-line booster pumps to efficiently and effectively excavate and deliver sand over 22 miles.

From a sustainability standpoint, the Scofield Island Project has resulted in an understanding from the restoration community that delivery of renewable sand resources from the Mississippi River via long distance pipeline is a viable alternative for barrier island restoration. Following construction of the Scofield Island Project, other projects have resulted in the use of Mississippi River sand resources and the Empire Waterway Conveyance Corridor for barrier island restoration

Economic Benefits

Restoration of barrier islands is a significant component of the Louisiana Coastal Master Plan. Full implementation of the Master Plan is projected to reduce expected annual damage from flooding throughout Louisiana's coast by \$5.3 to \$18 billion annually. Restoration projects in the Coastal Master Plan contribute to overall risk reduction for coastal communities by reducing storm surge. Barrier island restoration contributed to the economy by being the first line of defense in reducing storm surge.

From an implementation standpoint, the specifications for the Scofield Island Project allowed for a one-time slope adjustment. There had been no experience using sand from these riverine borrow areas to restore barrier island habitat and historical documentation of the constructability of gulf side slope did not exist. The sand from the borrow area was very well sorted and of a greater size (coarser) than previous barrier island restoration projects in Louisiana. It was evident during the early stages of construction that the sand resources proved to be high quality. The design estimated a more conservative Gulf side slope under water. The contractor and engineer agreed on a slope adjustment for the remainder of the Project and reallocation of sediment within the template to maintain the volume in the beach that the contractor based their bid on.

Transferability

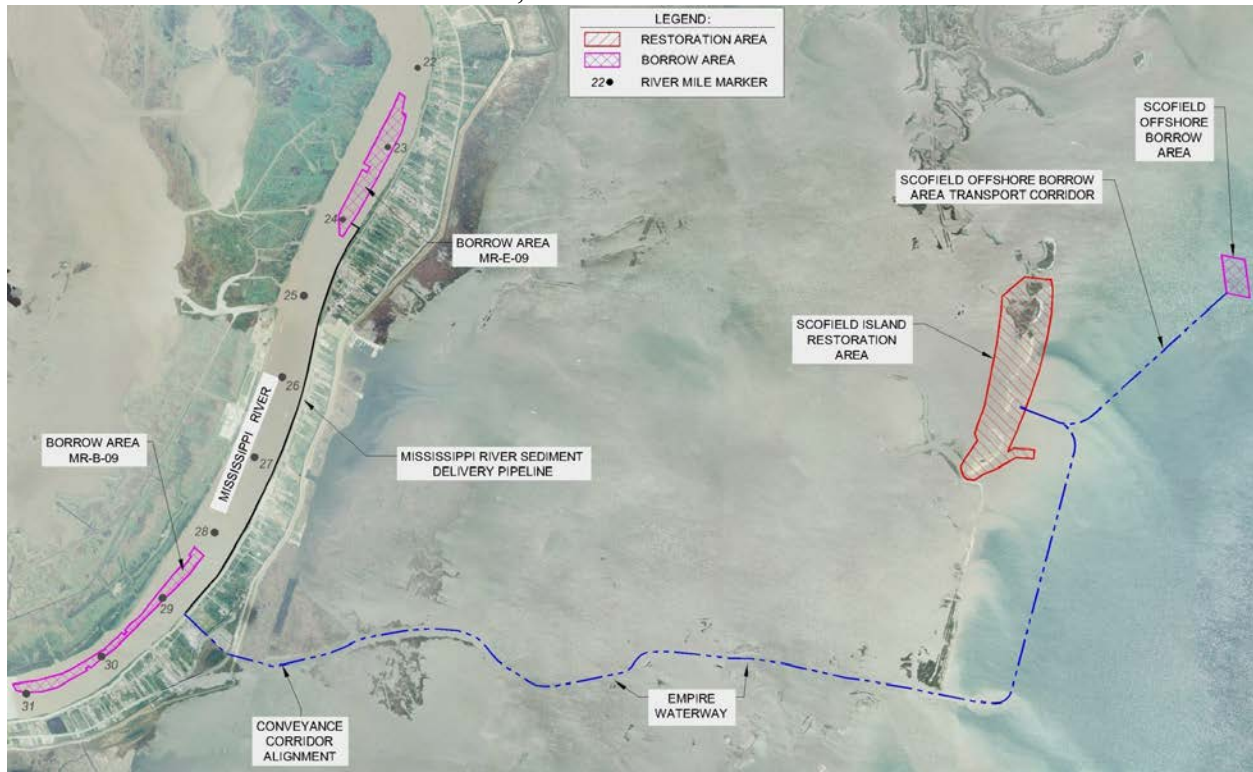
The Project characteristics and lessons learned have great transferability. The Empire Waterway Conveyance Corridor has subsequently been used for the construction of the Shell Island East Restoration Project and will be used for the construction of the Shell Island West Restoration Project. The CPRA has implemented another long distance sediment delivery project upriver from the Scofield Island Project, which benefitted from lessons learned during the feasibility phase of the Scofield Island Project. The effective outreach efforts from the Scofield Island Project have benefitted subsequent projects that have utilized Mississippi River borrow areas. Project teams planning, designing and permitting projects in the Mississippi River have a road map to follow to effectively coordinate with navigation interests.

Outreach and Education

Extensive stakeholder coordination was conducted by the sponsors (CPRA and NOAA Fisheries) and the consulting team during the planning, design, and construction phases. The borrow area is located in one of the busiest commercial stretches on the Mississippi River, traversed daily by freighters, supertankers, and barge traffic. The conveyance corridor traversed the Empire Waterway which connects economically important commercial fishery businesses located in Empire, Louisiana to the Gulf of Mexico (the Empire-Venice Marina has been one of the top 5 biggest seafood ports in the nation by landing weight for over 3 decades). Dozens of meetings were held to solicit input from the diverse interest groups and regulatory agencies. The discussions typically focused on the borrow areas in the river. The Mississippi River navigation interests were concerned with the dredge methodology and borrow area locations impacting navigation industry. The regulatory side was concerned with the impacts on river hydrodynamics from mining sediment from the Mississippi River. Discussion centered on the pros and cons of available borrow areas with mixed concerns from the various groups. The extensive outreach program was paramount in achieving success.

The Project team continued outreach coordination with the US Army Corps of Engineers and the Louisiana Maritime Association by attending and participating in regularly scheduled meetings of the Mississippi River Maintenance Forum to discuss channel conditions and related issues with the maritime industry. The Project team also coordinated with a broad range of navigation interests by attending and participating in meetings of the Maritime and Navigation Safety Association whose objective is to promote communications among the mariners who share waterways from Baton Rouge, Louisiana to the Gulf of Mexico, and to provide a forum that addresses the maximum usage of these waterways emphasizing navigational safety and the environment. During construction, stakeholders lauded the Project team's outreach effort as one that should be modeled by other restoration projects in Louisiana.

PROJECT FIGURES, DIAGRAMS AND PHOTOGRAPHS



Project Overview Map



Scofield Island Pre/Post-Construction



California Dredge in Borrow Area MR-E-09 in the Mississippi River



Mississippi River Levee Crossing



Hurricane Protection Levee Crossing



Boosters Erin, Jesse, and No. 8