



Contract Award to HarborRock

FACT SHEET

Maryland Port Administration Solicitation No. J03SO232091
Request for Proposals No. 270025-S

Contract Award

The Maryland Port Administration (MPA) has awarded the second contract under Solicitation No. J03SO232091 for the Innovative Reuse of Dredged Material. This award was to HarborRock LLC, on March 18, 2009, in the amount of \$289,500. The scope of their project is a test program to evaluate the use of a lightweight aggregate system to process fine-grained dredged material from the Cox Creek Dredged Material Containment Facility (DMCF) to produce a marketable lightweight aggregate (LWA) product. The test program is designed to evaluate the use of the LWA process on dredged material typically managed by MPA, obtain data for developing mass and energy balances, quantify air emissions, and assess the quality of the LWA produced with respect to market requirements.

Background

HarborRock has developed a proprietary technology for manufacturing LWA from dredged material. Manufactured LWA is used as a substitute or replacement for traditional natural dense aggregate in products such as masonry blocks, ready mix concrete, pre-cast concrete, and road asphalt. The main advantage of LWA is that it weighs up to 40% less than dense aggregate. There is an existing market for LWA that is currently manufactured using clay or shale. HarborRock estimates an annual market of 68 million tons of LWA within trucking distance of Baltimore. HarborRock has obtained a purchase commitment from a concrete products company for LWA meeting ASTM standards that would be produced commercially from dredged material in the Baltimore area.

The HarborRock process consists of preliminary natural dewatering of dredged material, screening to remove oversized materials, mechanical dewatering, grinding and thermal drying to a fine powder, high temperature conditioning, extrusion into pellets approximately 0.5 inch in diameter and one inch long, drying, and finally firing in a high temperature kiln. Water generated from dewatering the dredged material is treated to meet discharge permit requirements. Excess heat from the various process units is captured and recycled.

The rotary kiln and auxiliary air pollution control equipment proposed for use by HarborRock operate at temperatures sufficient to achieve 99.99% or greater destruction efficiency of organic compounds contained in dredged material. Metals typically contained in dredged material will be bound within the mineral matrix of the LWA produced and will be effectively rendered inert after processing in the rotary kiln. Any metals that are volatilized will be captured in the air pollution control system.

HarborRock has reportedly conducted bench and pilot scale tests on sediments obtained from over a dozen different ports in the United States. They have stated that in each case, the tests have shown that the LWA produced is of very high quality and will meet ASTM standards for LWA. The LWA produced was reportedly found to be inert and easily passed EPA Resource Conservation and Recovery Act Toxicity Characteristic Leaching Procedure standards for metals.

Project Summary

HarborRock and their process vendor will perform the test program on approximately five cubic yards of dredged material obtained from the Cox Creek DMCF. The test program will consist of nine major steps summarized below.

- 1. Collect and Ship Dredged Material Sample:** The representative five-cubic yard sample of dredged material will be transported by HarborRock to their equipment vendor, FFE Minerals, Inc., in Bethlehem, Pennsylvania.
- 2. Analyze Dredged Material Sample:** Subsamples will be thoroughly analyzed for both physical and chemical characteristics.
- 3. Dredged Material Drying:** The dredged material sample will be dried and size reduced using a pilot scale air-swept hammermill dryer system. Operational and emissions data will be collected for evaluation.
- 4. Flash Calcination:** The dried dredged material will be flash calcined¹ to evaluate carbon burnout and

calciner emissions. Calciner products and emission samples will be collected for analysis. The calcined dredged material will be collected for the next phase of the study.

5. **Laboratory Study:** A study will be conducted using the calcined dredged material and additives to determine appropriate conditions for material bloating (swelling) during thermal processing and for evaluating temperature requirements. This study will be conducted using a standard laboratory scale muffle furnace on samples of extruded dredged material pellets. Analysis of the emissions from the furnace will be conducted.
6. **Pellet Feed Preparation:** An optimum dredged material mix will be selected for pilot rotary kiln testing. This mix will be used to produce 0.5-inch diameter by one-inch long pellets in a pilot extruder. The wet pellets will be immediately stored in sealed containers to prevent drying.
7. **Rotary Kiln Test:** A variety of trial test burns will be conducted using a pilot rotary kiln equipped with an afterburner. Samples of the LWA produced will be collected for characterization testing along with off gases for emissions testing. Detailed operational conditions and parameters will be recorded for each run.
8. **LWA Analysis:** HarborRock will submit samples of the LWA collected for industry standard physical and chemical testing. HarborRock will also provide samples to potential LWA users for further evaluation.
9. **Final Report:** Once all test data are obtained, HarborRock will prepare a final report for MPA detailing the testing results and assessing the quality and marketability of the LWA produced from the dredged material sample. This report will provide the information necessary for evaluating the HarborRock process with respect to any decision to further pursue the manufacture of LWA from dredged material and permitting of a full-scale facility.

**Project
Coordination**

The project is being closely coordinated with MPA, the Maryland Environmental Service (MES) who operates the Cox Creek DMCF, and MDE. Project coordination meetings were held in September 2008 and May 2009 where HarborRock personnel presented details on proposed activities and MDE personnel discussed permitting issues associated with the pilot scale testing and a full-scale manufacturing plant. Additional coordination meetings will be held with regulatory agencies periodically over the duration of the project to ensure the test protocols will satisfy permitting requirements for full-scale processing. It is anticipated that HarborRock will be transporting material from Cox Creek and initiating their test program during early June 2009.

For more information, contact Bill Lear at (410) 385-4462.

¹ Calcination (also referred to as calcining) is a thermal treatment process applied to ores and other solid materials in order to bring about a thermal decomposition, phase transition, or removal of a volatile fraction.