



COLUMBIA NEAR-SHORE BENEFICIAL USE DEMONSTRATION PROJECT

Proposed for September 2005

Summary: Addressing the depletion of near-shore Columbia River sands and minimizing impact to shellfish and other species is one of the principal priorities of the bi-state Lower Columbia Solutions Group. Funding of \$70,000 is being sought for the first step in this process, an August 2005 demonstration of the “enhanced dumping” technique for thin-layer dispersal of dredged materials. For more information, contact Steve Greenwood, 541-968-4324.

I. Background

A group of federal, state, and local government officials has engaged with private sector participants in a collaborative process to explore the use of lower Columbia River maintenance dredge material to stem the depletion of the natural sand volumes in the near-shore environment off of the South Jetty of the Columbia River. The project team was convened by Jim Bergeron, a Port of Astoria Commissioner. Project support was provided by Steve Greenwood through the Lower Columbia Solutions Group and *Oregon Solutions*. (541-968-4324) Funding for the collaborative process was provided by the Oregon Department of Land Conservation and Development’s coastal program.

A recent white paper titled “Columbia River Littoral Cell – Technical Implications of Channel Deepening and Dredge Disposal”, by Jonathan Allen of the Oregon Department of Geology and Mineral Industries (DOGAMI) summarizes a body of research indicating significant erosion of near-shore sands resulting from the reduction in sediment in the littoral system.

Studies indicate that there is a loss of offshore sediment to the mid-continental shelf and near shore region offshore from the Clatsop Plains, resulting in greater wave energy being focused on the south jetty and the ocean shore. The long-term objective of a proposed supplementation of dredged sediments would be to keep these sediments in the littoral zone, and rebuild the offshore sands to prevent further erosion of historic habitat and better protect the jetty from the impacts of waves coming from the southwest. The project team has identified an iterative approach to accomplishing this objective:

- A small scale (30,000 cubic yards) testing of the enhanced dumping method of dispersal, in summer 2005. The key objective of this study is to determine the feasibility of “thin-layer” dispersal of dredged sediments in the near-shore area.
- Subsequent testing, using larger volumes (100,000 cubic yards) to determine the degree and direction of migration of deposited sediments in the near-shore environment.
- Subsequent measurement of biological impacts and navigational safety (wave) impacts prior to any long-term large-scale dispersal of dredged sediments in the near-shore environment.

II. Columbia Near-shore 2005 Demonstration

After consideration of various dispersal methods, the project team agreed to conduct a limited demonstration (30,000 cubic yards) of the enhanced dumping method in August/September of 2005. This test of the enhanced dumping method is intended to measure per-run ocean-bottom accumulations to verify estimated results of less than 2 inches. The results of this test will help determine the viability of this method in supplementing near-shore sediments while also helping to protect crab and other aquatic species.

The Port of Astoria is the principal applicant for the 2005 Demonstration proposal. Funding and other in-kind services for the project will come from project partners.

The 2005 Demonstration has been designed with the assistance of the Institute of Natural Resources at Oregon State University. It would take place over three days, after the close of crabbing season in late August. The demonstration will utilize a standard dredge, operated at higher speed and partially opened bottom doors, allowing a much thinner layer of material on the ocean bottom than standard dumping practices.

Size and Location specifics

30,000 cubic yards of material, dumped from a hopper dredge going at 2-6 knots.

5,000 cubic yards per dump-run, for a total of 6 runs. Each run is expected to take 10-25 minutes.

Location is 1-2 miles south of south jetty at -35 to -55 ft MLLW (this area is proposed in part because it has not received any prior dumping and because the conditions include no significant wave or current action).

The total area needed will be 7000 ft by 7000 ft. (For comparison, a normal, "non-enhanced" dump run would be 1500 feet. the expected footprint will be 500 feet wide for each dump.

Estimated Monitoring

The O.H. Hinsdale Wave Research Laboratory (WRL) will design, construct, test, and deploy a system that is capable of surveying the accumulation of sediment resulting from the limited demonstration of dredge disposal near the south jetty of the Columbia River Mouth.

The survey system will be designed to provide discrete measurement at approximately 6 to ten locations per line in the disposal, an example of which is depicted in Figure 1. Each measuring location will provide:

1. A sample of the accumulated sand using a catchment basin to provide an estimate of the disposal thickness, and
2. Where possible, a visible estimate of the accumulated depth using an underwater camera lowered to the bottom and a photograph taken of the catchment basin.

Survey Location

Surveys will be made at approximately 6 to 10 locations per line for up to 6 lines over three days. Exact locations will depend on the final, detailed description of the proposed dredge disposal. Measurements will be primarily along the centerline of the placement lines because these areas are expected to have the thickest accumulations. An additional 5 to 10 basins will be placed outside the disposal site either updrift or downdrift of the project area to act as control points.

Capability of the Survey System

The catchment basin will provide an estimate of disposal thickness with an accuracy of +/- 0.5 cm (0.2 inches) and can be used to provide a distribution of the sand at a particular location. Where possible, the camera system will provide secondary estimates (with a similar accuracy) and a digital photograph as a record.

Procedure and Timeline

The survey system will be designed, constructed and tested in Summer 2005, including testing in the large wave flume of the O.H. Hinsdale Wave Research Laboratory. Several hours before the disposal operation, OSU staff will deploy the catchment basins and survey stakes. Surveys will be taken, and equipment will be retrieved, on the same day of the dredge disposal operation, with an estimated 2 lines surveyed per day for 3 days. A report will be completed approximately 1 month after the survey is complete.

Budget for Demo Monitoring

Total Salaries, Wages, and Fringe	20,052
Equipment	5,000
Travel	4,420
Materials and supplies	5,000
Testing	8,400
Boat rental (6 days @ 2,000 per day)	12,000
Indirect Costs (26%)	14,267
Total (Direct+Indirect)	69,138

Budget Explanation

Personnel costs include one week of for senior personnel (Dan Cox) for project oversight, two months support of senior research assistant for development, testing, and deployment and retrieval of catchment basins. Equipment is GPS equipment, up to two underwater cameras, and additional instrumentation. Travel is requested to cover the costs for 6 days for three people to stay near the project site. Other direct costs include materials and supplies for the fabrication of catchment basins, three days of testing the device at the O.H. Hinsdale Wave Research Laboratory, and boat rental for six days.

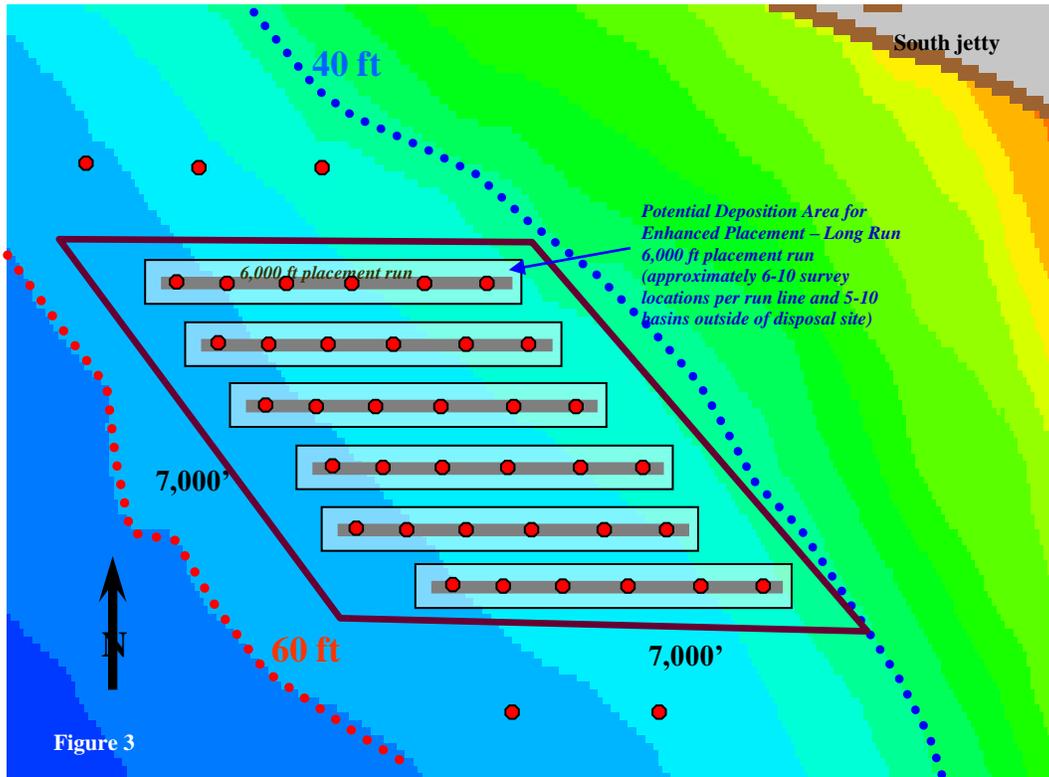


Figure 1: Approximate location of minimum number of survey points (figure modified from USACE).