

SHORELINES – February 2005 **As presented to the Island Review Magazine.**

The Section 933 Project this Winter – What Happened?

There were high expectations this past November in anticipation of the Brandt Island Pump-Out and Section 933 Project. The overall effort, which coalesces waterway dredging with beach nourishment, included concurrent maintenance dredging of the Morehead City Inner Harbor area and the pump-out of previously dredged inner harbor material that is stored within the upland disposal facility of Brandt Island. Collectively, the sediments from these two areas (the channel and Brandt Island) would be placed along a 10-mile stretch of Bogue Banks extending across the shorelines of Ft. Macon State Park, Atlantic Beach (AB), and Pine Knoll Shores (PKS). Beach nourishment along Ft. Macon State Park and AB constitutes the U.S. Army Corps of Engineers' "Base Plan" at 100% Federal cost, while the incremental cost to extend the beachfill through PKS simply represents the Federal/non-Federal cost-shared Section 933 Project.

However just a month later in December, the Section 933 Project portion of the overall beach nourishment effort was terminated. So what happened?

Subsequent to encountering some mud balls during the initial stages of the pump-out, it became apparent that once merged with water, the mixture of mud, other fine-grained sediments, and beach quality sand simply lowered the slurry's ability to drop the coarser-grained material on the beach when pumped. This caused the fine-grained material to diffuse offshore, and the fill to run and settle towards the sea at about a 1:50 to 1:60 slope (vertical : horizontal), rather than the 1:20 or 1:25 slopes we anticipated. This created an excessively gentle offshore slope that required a tremendous amount of material to achieve.

This process is depicted in the figure accompanying this article. Thus, what was planned to take only ~70 cubic yards per linear feet (cy/ft) to complete began consuming ~200 cy/ft (or more). As a matter of fact, the first ~4,600 linear feet of the project utilized well over 1,000,000 cubic yards initially pumped out of Brandt Island (approximately a third of what was stored in Brandt Island).

At this rate, we simply did not have enough material to construct the Section 933 option for PKS and a stop work order was issued to the dredging contractor for the Section 933 Project in early December. Ft. Macon and AB will continue to receive sand while modifications to the beach template are employed to maximize pumping distances with the hope of reaching the westward end of AB.

The good news is that the quality of sand improved quickly once the corridor between the Triple S and Oceanna Piers was completed, and if this trend continues, then approximately 13% of this year's effort in terms of shoreline distance will have been impacted by the fine-grained sediment quandary described above (~3,900/29,075 linear feet).

What's Next?

Obviously, there is an overlying, multi-pronged question that immediately comes to mind. How did the mud and fine-grained sand get into Brandt Island and why was this material not identified during pre-project environmental reconnaissance activities? The Corps and State are looking into this and it behooves no one that these set of

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circumstances transpired, whether that's the dredging contractor, local communities, the Corps, State resource agencies, etc.

While the easy route may lie in casting blame and finger-pointing, the local communities and Beach Commission have taken a proactive approach and are working cooperatively with Federal and State agencies to move forward from both a holistic standpoint in terms of sand management at the Harbor and on a more short-term level to resuscitate a Section 933 project for PKS. Some of the more salient aspects of this approach are summarized below.

Short-term: (A) Continue to utilize the sand remaining in Brandt Island and dredged from the inner harbor this year to ensure that the corridor extending from the Ft. Macon jetty to the Sheraton Pier is constructed. The characteristics of the sand have improved since the initial phases of the pump-out, and the coarser-grained sediments encountered since early December facilitate the construction of a manageable beach template.

(B) The shortcoming regarding the pump-out plan for Brandt Island was identified early in the process and canceling the 2004-05 Section 933 Project will save as much of the already appropriated Federal funding as possible to pursue a 2005-06 project. We had great success utilizing outer harbor dredged material for beach nourishment along Indian Beach/Salter Path in early 2004. It makes sense to pursue this attractive option for PKS in 2005-06. The outer harbor is maintained each year and hopefully with a little work, all the Federal and non-Federal funds can be positioned in the right places to construct an outer harbor Section 933 Project for next year in PKS.

Long-term: Sand management, sand management, and more sand management. This year's pump-out has illustrated the need to view dredged material as a resource and not as a pure disposal product. If there are pockets of undesirable material in the inner harbor, then maybe a separate disposal option should be employed for these sediments rather than the Brandt Island alternative. Likewise, it appears that the best quality sand resides as shoal material in the outer harbor and is inherently part of the inlet-beach sand sharing system. The use of this sand for beach nourishment helps restore the sediment budget for Bogue Banks that is otherwise diverted by the existing offshore disposal plan implemented for the outer harbor while providing perfect sand to sustain our beaches.

Waterway dredging and beach nourishment have many similarities including parallel environmental issues to consider, ongoing funding struggles, recreational benefits that are difficult to quantify and seem to get overshadowed, and the foremost issue perhaps of transferring sand to the proper areas that benefit society, economies, and the environment to the best possible extent. In the long run, the issues that surfaced during this year's pump-out may actually help us take a more comprehensive approach to our water resource needs.

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