file
Mobile Co.

SAMPD-N

5 February 1976

MEMO TO: District Engineer

SUBJECT: Dauphin Island Beach Nourishment via Hopper Dredge

1. Reference is made to attached MDO and OCE correspondence and your memo on the above subject.

2. The processes resulting in the erosion problems on Dauphin Island are implied from general observations of the overall system existing around the entrance to Mobile Bay. The severe erosion on the east end of the island appears to be direct result of wave attack from the prevailing wind direction (SE). The shore material is suspended by the impinging waves and moved offshore where it is then distributed to the west by the prevailing westerly littoral drift. The majority of this sand probably nourishes the westerly reach of the island's gulf beaches although some unknown amount is probably lost to deeper water.

3. The wave attack has become sufficient to be a significant eroding factor only in recent years with the westerly migration and diminishing of Sand and Pelican Islands. These islands once extended from the old lighthouse adjacent to the bay ship channel entrance to near the existing public fishing pier. The historical southeasterly shelter provided by these islands actually defines the portion of Dauphin Island that is forested and can be regarded as having a significant degree of permanence. This feature is most evident from an aerial view of the island.

4. The beginning of the westerly migration of the islands and the essential disappearance of Sand Island cannot be accurately documented since it would have been a relatively slow process and the islands are known to have been destroyed by past hurricanes and subjected to periodic migration, accretion, and erosion. However, their relatively recent (30 to 50 years) westerly move and diminishment could be related to the increasing depths provided in the Mobile Harbor entrance channel. The westerly drift of the small islands has exposed the southeast end of Dauphin Island to southeasterly wave attacks resulting in pronounced erosion.

5. The need for nourishment of the beach on the southeast end of Dauphin Island is evident. Direct pump out from the Goethals of suitable sand dredged from the entrance channel onto the eroded areas would be the most forthright and simple way to remedy the erosion effects. Although this would not diminish the eroding agent (SE waves), repetitive nourishment would offset the effects. In view of the contention by OCE that it would be impractical to ship extra piping for the Goethals to Mobile for this

single purpose and then back to Philadelphia, it is believed a good case could be supported for maintaining a supply of such pipe in SAD or, more specifically, MDO. Shore pump out capability with long transport is needed at Gulfport (Ship and Cat Islands), Pascagoula (Petit Bois Island), Mobile Bay (Dauphin Island), Pensacola (Santa Rosa Island), and at Panama City Harbor entrance. The funding and time constraints of acquiring the piping are acknowledged but should not be visualized as prohibitive in terms of the long-term nature of the above needs.

6. In the case of Dauphin Island an alternative to direct nourishment may be considered. Pump out of material on a regular basis from the channel into the vicinity of the old lighthouse and former Sand Island would begin the restructure of a protective island barrier against the eroding waves. This, of course, would not renourish the eroded areas but could, eventually (a considerable number of years could be involved), diminish or cut off the eroding waves and prevent a worsening of conditions. Since the disposal area is in the near vicinity of the channel, no extra pipe would be required for the Goethals. Precautions would be necessary to assure that the material was not moved back into the channel during drift reversals.

7. In view of the above analysis of processes affecting erosion, at least a circumstantial case could be put forth in support of justifying Federal mitigation for the indirect erosion effects of the ship channel. The theory of deprivation of sand nourishment to Sand and Pelican Islands as a result of the ship channel could probably be illustrated theoretically; however, little firm data would be available to support the contention. A Section 111 report without firm data for support would probably have difficulty in becoming authorized. Further, the fate of Section 111 as well as other continuing authorities studies and projects is uncertain.

8. The only remaining option to those outlined above is the potentiality of some development from the survey study. Benefits from protection of structural developments on Dauphin Island are not sufficient to justify hurricane protection works. Although the shoreline is eroding, wide beaches remain for recreational purposes. Any benefits gained from beach nourishment would essentially be gained from a higher use of the new project than that now realized from the existing beach. These benefits would accrue from public facilities that would be required of local interests more so than from the improvement. The installation of service facilities by local interests along the entire gulf reach of Dauphin Island is difficult to visualize; however, provision of a small recreational beach in the primary problem area, south and west of Fort Gaines, may warrant further consideration before concluding the survey study. Such a facility would renourish the eroded area and could act as a feeder beach for the shoreline west of that area essentially solving the erosion problem. Such a development, if justifiable, would require a serious commitment on the part of local interests.

9. Most of the above assumptions of processes, problems, and remedial actions should be substantiated by additional studies and investigations if pursued. However, the probability of justifying either Section 111 mitigation or improvements through the survey study process is considered low. It is recommended that all efforts to facilitate nourishment of either Dauphin Island's beaches or the offshore islands with maintenance from the ship channel be completely exhausted prior to consideration of the Section 111 or survey study route.

Cy of draft furn:
OP-O
EN-YD

H. J. LEE
Chief, Navigation and Coastal Branch

SADCO-O (17 Oct 75) 1st Ind
SUBJECT: Hopper Dredging - Mobile District

DA, South Atlantic Division, Corps of Engineers, 510 Title Building, 30 Pryor Street, S. W., Atlanta, Georgia 30303 22 October 1975

TO: District Engineer, Mobile

1. We generally concur in your efforts to utilize direct pumpout to combine the need for dredging and beach nourishment in one operation. However, the operation under discussion is economically and timely impractical as outlined in the following.

2. The Dredge Goethals can effectively pump sand through a discharge line up to 8,000 feet. The Coast and Geodetic Survey Chart #1266 of the Mobile Bay shows the distance from the 30 feet contour line nearest the beach (loaded dredge draws 29½ feet) to the furthest distance to be pumped to be about 15,000 feet. Ways to overcome this difficulty such as dredging an approach channel to the beach or utilizing booster pumps are economically impractical for a one-time effort.

3. The only government-owned 28" dredge piping is installed in several locations in the Philadelphia District. It is economically impractical to retrieve, cut up, and ship this piping to Mobile for a single short term assignment and return and reinstall it. The alternates of procuring piping and shipping it to Philadelphia after use or keeping it within SAD for possible future use are problematic due to funding and time constraints. Procurement and installation of this pipe are estimated at six and two months respectively.

4. As stated above, we believe in the desirability (or even need) of pumpout operations within SAD. However, these operations must be of sufficient scope on a repetitive basis to warrant the procurement of our own discharge pipe. This will occur if and when the Gerig should

SADCO-O (17 Oct 75) 1st Ind 22 October 1975
SUBJECT: Hopper Dredging - Mobile District

be converted to direct pumpout. If a pumpout dredge from outside SAD is used, only a long term or several short term assignments annually within SAD will assure economical operations.

Norman L. Engard

DANIEL D. HALL
Colonel, Corps of Engineers
Acting Division Engineer

NORMAN L. ENGARD
Executive Assistant

wd all incl

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628

REPLY TO
ATTENTION OF:

SAMDE

17 October 1975

SUBJECT: Hopper Dredging - Mobile District

Division Engineer, South Atlantic

1. Reference is made to several telephone conversations with SAD personnel and to the attached correspondence with Marine Environmental Sciences Consortium, Dauphin Island, Alabama, regarding beach nourishment on eroded beaches at Dauphin Island.

2. As noted in the attached report, severe beach erosion is occurring near the eastern end of the island. Our own investigations have borne this out.

3. Due to the very exposed location, the most logical method of beach nourishment would be direct pumpout from a hopper dredge. In addition, the material normally removed from the entrance channel of Mobile Harbor is excellent for this purpose.

4. The present hopper dredge schedule provides for the Dredge GERIG to be assigned to Mobile Harbor for the month of April 1976. However, it is understood that major changes are to be made in the schedule in the near future due to recent bidding of the ESSAYONS at Tampa. In view of these facts, it is recommended that the Hopper Dredge GOETHALS be assigned to the Mobile District for a two month period this fiscal year in lieu of the GERIG as now scheduled. The GOETHALS could perform routine dredging at Pensacola and Pascagoula Harbors and then be used for direct pumpout at Mobile Harbor. The GOETHALS should arrive in Mobile with all necessary attendant plant to accomplish the desired work. This should include approximately 6,000 feet of pipeline that could be submerged from the dredge to the island with an additional 2,000 - 4,000 feet of line for use on the beach. It is also preferable that this work be accomplished prior to June or after September.

Incl
as

DRAKE WILSON
Colonel, CE
District Engineer