

Memorandum For Record

Subject: Laguna Madre Fluid Mud Survey System Field Results:
27-29 March and 9-10 December 1996.

1. Background. Hydrographic surveys were completed over several priority reaches of the lower Laguna Madre intracoastal channel during 27-29 March 1996. Survey objectives included defining the presence and volumes of any fluid mud based on standard acoustic returns and a towable gage that rides along the channel bottom. The channel reaches surveyed 27-29 March showed no appreciable amounts of fluid mud. (RE: 3 June 1996 memorandum.)
2. The December survey focussed on the priority 1 reach, stations 45+000 to 65+000. Survey goals included a combined survey with SWG surveyors for direct comparisons of methods and results. The WES survey boat *Mr. George* was operated over the reach with a 200/40 kHz dual frequency fathometer along with the towed fluid mud gage. Vertical density profiles and bottom samples/push cores were also collected. The SWG survey party on the *San Antonio* also surveyed this reach with their 200 kHz fathometer. The *San Antonio* is also outfitted with a 40 kHz transducer used on an as-needed basis. Differential GPS positioning was used on both vessels.
3. Mr. Pedro Lopez and the survey party aboard the *San Antonio* described fluid mud survey difficulties with post-dredging surveys, and that this is basically the only times they encounter survey difficulty in the Laguna Madre channel. Mr. Lopez reports that it often takes several days following dredging in a particular channel reach before credible soundings can be recorded. Also, a certain amount of disposal mounds (Islands) along the disposal areas disperse over time. One effort to contain dredged material with dikes resulted in complete dispersal over time, including the dikes. This information corresponds with a Conrad Blucher Institute study that monitors a fluid mud condition generated by and following dredging operations in the Laguna Madre Estuary.
4. It has been approximately 2 years since the priority 1 reach has been dredged. Project dredging is allowed to -14 ft, mean low tide, with an additional 2 ft of overdepth dredging. Although no precise shoaling rate estimates are possible using this field data, the average net change in bottom depth between the two surveys was evaluated. Basically, no change in available channel depth occurred between March and December 1996. Average depths along stations 45+000 to 65+000 were -10.2 ft mean low tide (MLT) in March and were -10.4 ft MLT in December. (The slight depth increase between these values is likely a product of

DRAFT

the rough averaging methods used for this preliminary report.

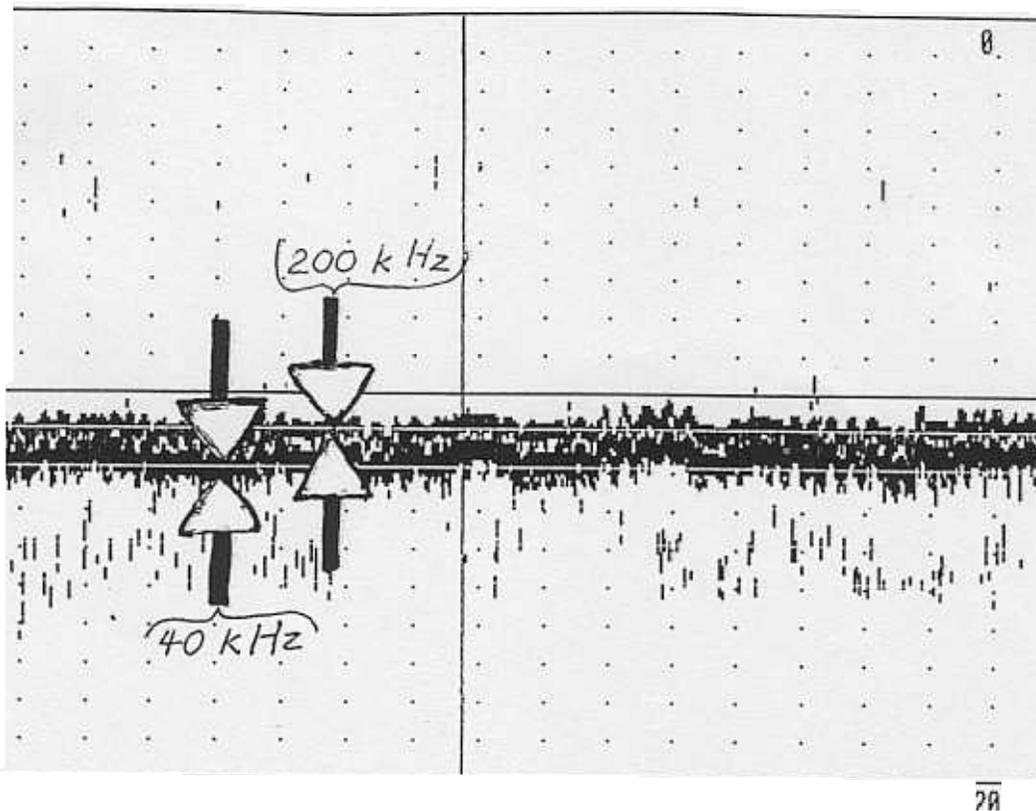
5. Survey Method Comparisons. Standard acoustic bar checks were completed by both the WES and SWG survey parties. Speed of sound adjustments were discussed and the same value was used for both survey systems. Not surprisingly, the acoustic results were the same for both survey parties. A sample of WES/SWG acoustic data is provided in Figures 1 and 2. Note that the WES system 40 kHz bottom measurement is generally 0.5 to 0.75 feet deeper than the high frequency results. Experience proves that dual frequency acoustic results cannot always define a fluid mud condition. Here, as expected, the lower frequency penetration is greater, but the material in question was a consolidated silt/clay layer. Figure 3 is a typical cross-section of the shoaling condition.

6. Towed gage Evaluation. As with March survey results, the towed fluid mud gage data indicate no measurable fluid mud condition. The bottom profile returned by the towed gage followed the same levels as the high frequency acoustic records

7. Bottom Samples. Laboratory analyses are incomplete at this time, but the samples collected along the priority 1 reach were quite consolidated. A bottom core in the priority 1 channel was armored with a thin layer of sand on top, followed by a dense layer of consolidated silt/clay, and then by a very compact, nearly dry, sand layer. As with the March survey, bottom conditions were found to be firm and consolidated.

Mike A.
Mike Alexander
Coastal and Hydraulics
Laboratory

DRAFT



2A

Figure 1. WES 200 and 40 kHz survey profiles along station 57+000.

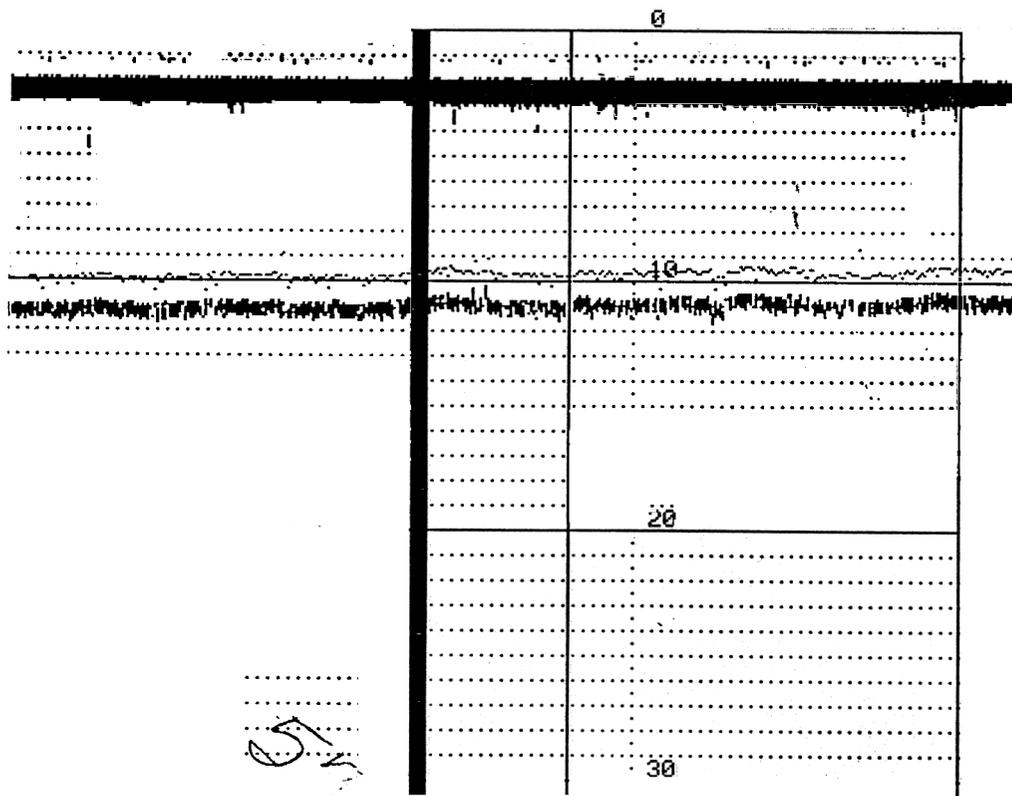
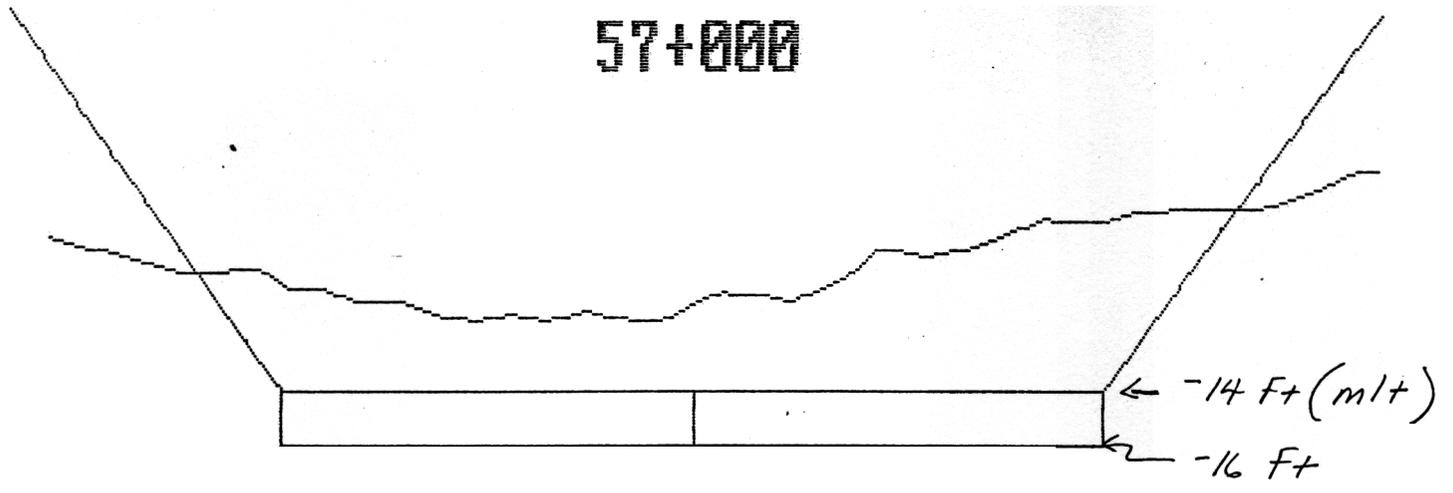


Figure 2. SWG 200 kHz survey profile along station 57+000

57+000



AREA ABOVE -	568.12	C.G. ABOVE DESIGN =	116.1
AREA BETWEEN REMAINING =	250.00	C.G. OVERDEPTH =	104.5
AREA BELOW -	183.54	C.G. NON-PAY =	79.8

Figure 3. Typical cross-section