

**US Army Corps  
of Engineers**  
Galveston District

**MATAGORDA SHIP  
CHANNEL, TEXAS**

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**PRELIMINARY  
PROJECT ASSESSMENT**

**U.S. Army Engineer District, Galveston  
Southwestern Division  
January 2000**

# MATAGORDA SHIP CHANNEL, TEXAS

## STUDY AUTHORITY AND PURPOSE

This Preliminary Project Assessment (PPA) complies with EC 1165-2-200, "National Harbors Program: Dredged Material Management Plans (DMMP)," dated 21 July 1994. The purpose of this assessment is to establish whether a more detailed DMMP study is required and, if so, to provide the information necessary to permit its prioritization in the District's budget and workplan.

## PROJECT INFORMATION

### General Description

The Matagorda Ship Channel is a Federal navigation project which includes both deep draft and shallow draft navigation channel improvements. A deep draft channel extends from the outer bar in the Gulf of Mexico through Matagorda and Lavaca bays to Point Comfort. A shallow draft channel serves Port Lavaca and the Harbor of Refuge. At the outer bar, the entrance channel is 38 feet (ft) deep, 300 ft wide, and slightly more than three miles in length. The Channel to Point Comfort is 36 ft deep, 200-300 ft wide, and about 21 miles in length. The project, shown on Figure 1, also provides for dual jetties at the entrance. This PPA will address only the main Channel to Matagorda. The Channel to Port Lavaca and Harbor of Refuge will be covered under a different PPA. Table 1 provides channel dimensions for Matagorda Ship Channel.

**Table 1.**  
**Channel Dimensions**

Reach or Segment	Depth (ft)	Width (ft)
Outer Bar and Jetty Channel	38	300
Channel to Point Comfort	36	300-200
Turning Basin	36	1,000

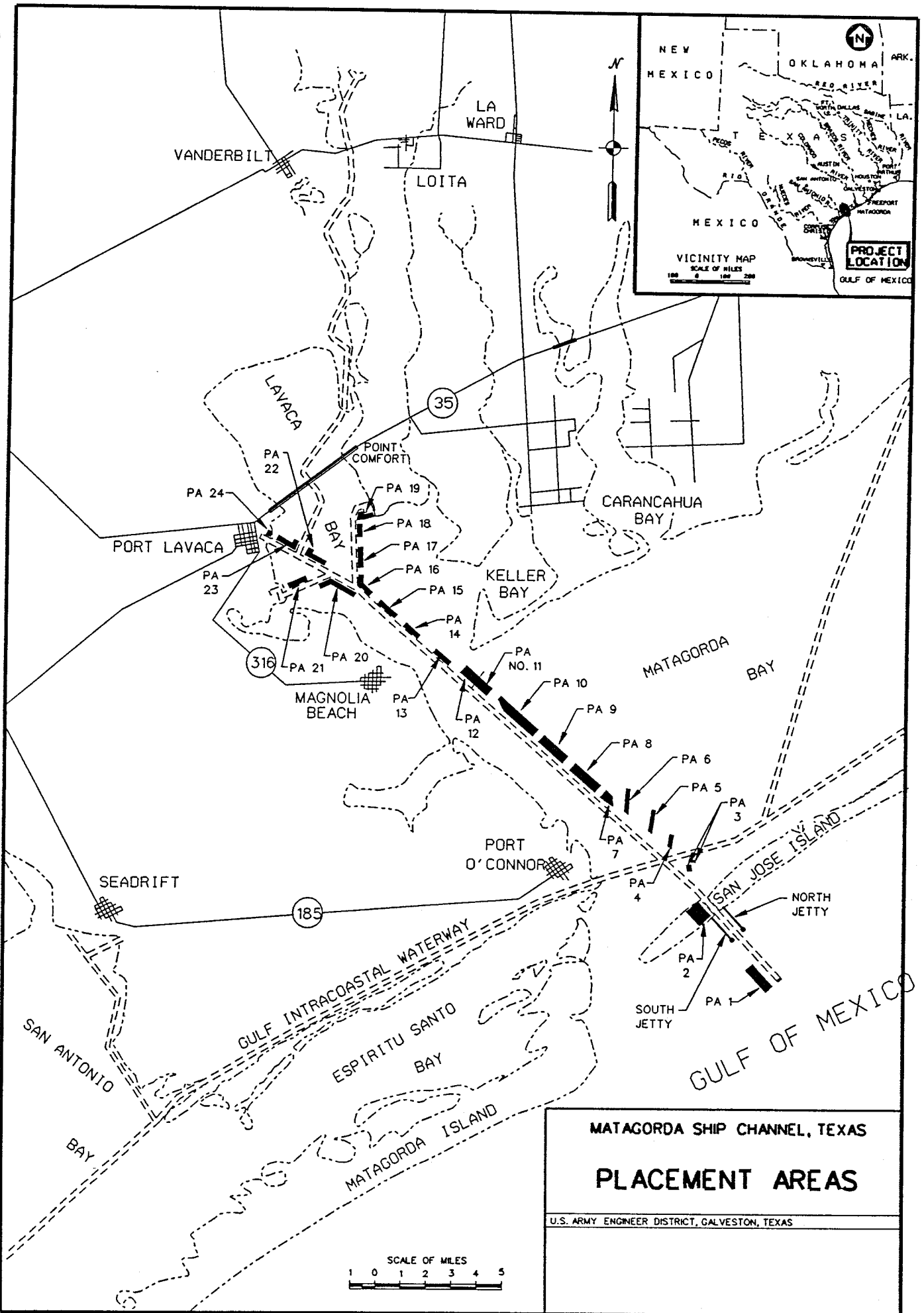
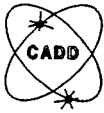


FIGURE 1

## Non-Federal Sponsor

The Matagorda Ship Channel main channel is sponsored by the Calhoun County Navigation District, P.O. Box 397, Point Comfort, Texas, 77978.

## PROJECT AUTHORIZATION

Table 2 provides dates and descriptions of Federally authorized project features.

**Table 2.**  
**Authorized Project Features**

<b>Date</b>	<b>Project And Work Authorized</b>	<b>Documents</b>
25 June 1910	Construct a channel 7 ft deep and 89 ft wide.	H. Doc. 1082, 60 <sup>th</sup> Cong., 2 <sup>nd</sup> Sess.
30 August 1995	Extend the channel to the shoreline of Lavaca Bay at the mouth of Lynns Bayou.	Rivers and Harbors Committee Doc. 28, 74 <sup>th</sup> Cong., 1 <sup>st</sup> Sess.
26 August 1937	Deepen and widen the channel to its present project dimension of 12 ft deep and 125 ft wide.	Rivers and Harbors Committee Doc. 37, 75 <sup>th</sup> Cong., 1 <sup>st</sup> Sess.
02 March 1945	Construct a harbor of refuge 9 ft deep near Port Lavaca and an approach channel of equal depth and 100 ft wide.	H. Doc. 731, 79 <sup>th</sup> Cong., 2 <sup>nd</sup> Sess.
03 July 1958	Construct an entrance channel 38 ft deep and 300 ft wide, a 22-mile long channel with a depth of 36 ft and a width of 200 ft across Matagorda and Lavaca Bays to Point Comfort, a turning basin 36 ft deep and 1,000 ft square at Point Comfort, and dual jetties at the entrance of the Gulf of Mexico.	H. Doc. 388, 84 <sup>th</sup> Cong., 2 <sup>nd</sup> Sess.

## PLACEMENT AREAS AND DREDGING

### Placement Areas

The Matagorda Ship Channel is divided into two reaches, the Entrance Channel, and the Matagorda Peninsula. A total of 19 placement areas (PAs) are used for maintaining the project. The Entrance Channel is maintained by hopper dredge on a four-year cycle with all material placed in PA 1, which is an offshore open water area. The Matagorda Peninsula to Point Comfort reach is maintained on a two-year cycle and contains thirteen open water areas in Matagorda Bay, three upland unconfined sites, and two open water emergent areas. These areas are all relatively small, 10 to 140 acres, with nine areas becoming emergent.

Table 3 shows the volume of material that has been dredged to maintain the project. Records include dredging since 1970 for the offshore section and since 1962 for the bay section of the channel. Since none of the sites are confined, their capacity is theoretically unlimited. The dredging records do not provide adequate detail to estimate individual usage of the placement areas. Therefore the shoaling rates were averaged over reaches and the section of the channel adjacent to the placement area. PAs 5, 6, and 7 use the same length of channel, therefore the same amount of material was assumed to be placed in each.

Table 3 shows no material going to PAs 2 and 13. PA 3, Sundown Island, is a valuable bird habitat. The Island is eroding at a high rate and the dredged material from the lower reach of the channel, has been placed on the island to help counteract the erosion on the island. Therefore PA 2 was not used. PA 13 was not used in the last dredging operation and therefore was not included here. Most of the PAs are considered to be high quality bird habitat and have environmental windows when they can be used.

From Station 95+000 to the end of the project at 117+223 has an extremely high shoaling rate and places considerable pressure on PAs 16 through 19. The material placed in these PAs is considered to be recycled due to the physical characteristics of the site. In 1998, a geotube project was conducted to reduce the return of sediment to the channel. Monitoring needs to be conducted to determine the success of the project. As described in the Environmental Section of this PPA, portions of the Matagorda Ship Channel cross a superfund site with mercury contamination. Solutions to the contamination have yet to be determined, but may affect maintenance dredging in the future. To date, no modification has been required due to contamination levels.

### **Summary of Analysis**

The majority of PAs are open water unconfined sites with little engineering limitation to their future use. The primary limitation is that many of the PAs are considered valuable bird habitat and have environmental windows associated with their use.

**Table 3.  
Placement Area Usage and Limitations**

Reach	PA	Type	Size (Ac)	Levee Height (ft)	Max Levee Height (ft)	Capacity (cu yds)	Total Dredged (cu yds)	Yearly Average (cu yds)	Remaining Capacity/ Notes
0+000 to -17+000	1	OD	120	NA	NA	Unlimited	9,753,955	375,152	Unlimited
	2	UU	120	NA	NA	Unlimited			Not Used
0+000 to 15+800	3	UU	20	NA	NA	Unlimited	2,908,326	88,131	Unlimited
15+800 to 19+350	4	OU	12	NA	NA	Unlimited	2,011,776	60,963	Unlimited
19+350 to 22+900	5	OU	10	NA	NA	Unlimited	2,054,145	62,247	Unlimited
22+900 to 26+450	6	OU	10	NA	NA	Unlimited	2,054,145	62,247	Unlimited
26+450 to 30+000	7	OU	32	NA	NA	Unlimited	2,054,145	62,247	Unlimited
30+000 to 36+950	8	OU	96	NA	NA	Unlimited	3,885,232	117,734	Unlimited
36+950 to 47+500	9	OU	76	NA	NA	Unlimited	5,897,726	178,719	Unlimited
47+500 to 58+100	10	OU	120	NA	NA	Unlimited	5,925,677	179,566	Unlimited
58+100 to 66+000	11	OU	84	NA	NA	Unlimited	4,416,307	133,827	Unlimited
66+000 to 71+300	12	OU	20	NA	NA	Unlimited	2,967,840	89,935	Unlimited
	13	OU	68	NA	NA	Unlimited			Not Used
71+300 to 89+760	14	OU	96	NA	NA	Unlimited	11,867,212	359,612	Unlimited
89+760 to 95+000	15	OU	140	NA	NA	Unlimited	4,337,346	131,435	Unlimited
95+000 to 100+300	16	OU	75	NA	NA	Unlimited	13,898,917	421,179	Unlimited
100+300 to 103+000	17	OU	100	NA	NA	Unlimited	7,080,580	214,563	Unlimited
103+000 to 110+900	18	OU	50	NA	NA	Unlimited	20,717,254	627,796	Unlimited
110+900 to 117+223	19	UU	93	NA	NA	Unlimited	9,958,051	301,759	Unlimited

OD = Ocean Disposal  
OU = Open Water Unconfined

UU = Upland Unconfined  
NA = Not Applicable/Unknown

## **ECONOMIC ASSESSMENT**

### **Prior Economic Conditions**

This assessment addresses improvements authorized under the Matagorda Ship Channel Project. The deep-draft portion of the project includes a 38 by 300-ft 2.8 mile long entrance channel and a 36- by 200-ft ship channel, which extends 22 miles across Matagorda, and Lavaca bays to Point Comfort.

The purpose of the Matagorda Ship Channel authorization was to construct a deep-draft channel from the Gulf of Mexico to and including a turning basin at Point Comfort, Texas. Prior to the deep-draft authorization, no existing Federal project existed for deep-draft navigation between the Gulf of Mexico and Point Comfort. The deepening project was designed to accommodate a maximum vessel size of about 32,000 dead weight tons (dwt). The respective length, beam, and design draft dimensions associated with a 32,000 dwt vessel are 650-ft, 88 ft wide, and 34 ft.

The primary commodity transported through the project area at the time of authorization was seafood. Survey data compiled prior to project authorization showed that about two million pounds of shrimp caught in the Gulf of Mexico were moved inbound through Pass Cavallo and about 6,000 tons of ice were carried outbound on the fishing vessels. In addition, about 600,000 tons of commercial barge cargo was transported through the project area. Justification for channel deepening was based on prospective shipments of bauxite ores. Annual prospective deep draft shipments of bauxite were forecast to result in a net increase of 1,080,000 tons. The prospective tonnage volume represented a 75 percent increase over the 1953 tonnage volume of 615,600 tons. No growth rates were stated in the authorization report. Tonnage statistics for the year 1953 were displayed in the authorization document. The distribution of tonnage by commodity type was crude petroleum (68 percent of total), shell (26 percent), and ores (six percent). In 1967, the year that project construction was completed, bauxite tonnage was 3,050,200. The 1967 volume represented a 182 percent increase over the authorization forecast of 1,080,000.

### **Current Economic Conditions**

Examination of the 1997 Waterborne Commerce Statistics showed that deep-draft ore tonnage entering the Matagorda Ship Channel was 4,945,000 tons, up 62 percent from the 1967 volume of 3,050,200 tons. Aluminum ore imports are presently the principal commodity,

representing 72 percent of total 1997 deep-draft tonnage. Comparison of the 1997 tonnage with the authorization forecast shows over a 300 percent increase.

### **Maintenance Cost**

The cost effectiveness of continued maintenance was evaluated based on an assessment of benefit indicators and a comparison of the average annual maintenance cost outlined in the authorization document in relation to recent average annual maintenance costs. The benefit indicators evaluated for this assessment were overall tonnage and vessel fleet trends. The economic assessment worksheet is presented in Table 4.

Assessment of the benefit indicators showed that the current tonnage volume and vessel sizes exceed the authorization forecast. Total tonnage has increased 75 percent during the period between 1992-97. The average rate of growth for the five-year period was 15 percent per year. The dwt range of the current vessel fleet is twice that anticipated at the time of project authorization. The channel was designed for a maximum vessel size of 32,000 dwt. Currently, vessels of 60,000 dwt or larger use the channel on a regular basis. The combined effect of increases in vessel sizes and associated increases in tonnage volumes indicates that continued maintenance of the Matagorda Ship Channel is warranted.

Comparison of the average annual maintenance cost presented in the authorization document with recent historical costs, adjusted to authorization document cost levels, showed that actual maintenance costs are seven percent lower than forecasted. An average annual project maintenance cost of \$345,000 was shown in the authorization report. This cost was in 1954 dollars. Analysis of 1970-96 maintenance cost data, adjusted to 1954 price levels using the Engineering News Record (ENR) indices, showed that over the 26-year period average annual maintenance costs were \$323,200. The combined effect of increasing tonnages, larger vessel sizes, and lower than forecasted maintenance costs indicates that continued maintenance of the Matagorda Ship Channel is warranted.

### **Conclusion**

Analysis of the economic benefit and cost indicators showed that continued maintenance of the Matagorda Ship Channel. This determination was based on increasing tonnages and an overall constant project maintenance costs. Additional economic analysis for Matagorda Ship Channel is not necessary.



**Table 4.**  
**Economic Assessment Worksheet for Continued Maintenance Dredging**

	<b>Economic Statistics</b>	<b>Authorizing Study</b>	<b>Current Conditions</b>	<b>Assessment</b>	<b>Summary</b>
Benefit Indicators	Commodity Types	Crude Petroleum, Bauxite, Seafood	Aluminum Ore, Chemical and Petroleum Products and Seafood	Up	Up
	Tonnage Estimates	1.7 million tons of vessel cargo was forecast. Annual Matagorda Bay System landings were 2 million pounds	9.4 million tons of vessel cargo. Over 7 million pounds of seafood harvested in Matagorda Bay System.	Up	
	Growth Rates	Not Stated	Current vessel tonnage exceeds the forecast by 500%.	Up	
	Vessel Types	Ore carriers and commercial fishing vessels.	Ore carriers, tankers and commercial fishing vessels.	UP	
	Vessel Sizes	Ore carriers with loaded drafts to 34 ft and commercial fishing vessels with loaded draft to 8ft.	Ore carriers with loaded draft of up to 36 ft and commercial fishing vessels with loaded draft to 10 ft.	Up	
Cost Indicators	Dredging Cycle	Not Stated	1.4 Years	N/A	Down
	Annualized Dredging Quantities	Not Stated	3,467,085 cubic yards	N/A	
	Avg. Annual Maintenance Cost	\$345,000	\$323,200	Down	
	Price Level	1954	1970-94 adjusted to 1954 prices.		
Conclusion	Justification of continued maintenance dredging is warranted. Further economic analysis need not be completed.				

## ENVIRONMENTAL COMPLIANCE

### Status of Compliance for the Next 20 Years

The current dredged material placement plan is in compliance with the environmental documents described in Table 5. Impacts have been assessed and described. In addition, a variety of environmental management activities currently occur on the project. These include: chemical and bioassay testing of the dredged material, seasonal restrictions on dredging for endangered species, and selective placement of dredged material. Submission of a consistency determination to the Coastal Coordination Council was made in January 2000.

**Table 5.**  
**Environmental Compliance**

<b>Reach or Segment</b>	<b>Document</b>	<b>Date</b>
Matagorda Ship Channel	Final Environmental Statement, Maintenance Dredging, Matagorda Ship Channel, Texas, U.S. Army Engineer District, Galveston, Texas	October 1974
	State Water Quality Certification	September 1978
Entrance and Jetty Channel	Final Environmental Impact Statement, Matagorda Ship Channel, Ocean Dredged Material Disposal site Designation, U.S. Environmental Protection Agency, Region 6, Dallas, Texas.	July 1990
	Submission for consistency Determination, Coastal Coordination Council	January 2000

Portions of Lavaca Bay and Matagorda Bay, in conjunction with ALCOA (Point Comfort), were added to the National Priorities List (General Superfund Section) 25 March 1994 by the U.S. Environmental Protection Agency (EPA) due to mercury contamination resulting from industrial discharges. Maintenance dredging of reaches within the designated superfund site requires additional coordination with the EPA, Texas Natural Resource Conservation Commission, National Oceanic Atmospheric Administration and other appropriate Federal and State agencies prior to maintenance dredging activities. Sampling programs prior to, during, and after dredging and

material placement activities have been conducted in the past in coordination with the EPA and other agencies to monitor levels of contamination and have resulted in no modification to dredging and placement practices identified in the 1974 Final Environmental Statement. It is expected that coordinated sampling programs will be required for future channel maintenance activities over the next 20 years.

No solution for the contaminants within the bay has been determined by the EPA and consulting agencies. Until a solution is implemented, the contaminants are free within the system and available for migration due to storms, etc. If levels of contaminants in the channel increase significantly, there is the potential for considerable changes to the dredging and dredged material placement practices. The final recommendation of the Superfund cleanup may affect the ongoing dredging and maintenance program

The Matagorda Ship Channel is currently compliant with all the environmental requirements. A consistency determination was submitted to the Coastal Coordination Council in January 2000.

## **CONCLUSIONS**

There is no capacity, environmental or economic limitations within the Matagorda Ship Channel to continued maintenance dredging. The project is currently compliant with all environmental requirements, however, major environmental concerns are evident based on the mercury contamination of bay bottoms.

## **RECOMMENDATIONS**

High shoaling and concern for recycling of sediments from the channel should be investigated, particularly for the section of the Channel above station 95+000. The Galveston District should continue to coordination with the EPA on the superfund issues and continue to investigate sediment contamination issues associated with the mercury contamination. Particular concern will be the migration of contaminated sediments during high energy events. The final solution for the superfund sight could result in significant changes in dredging and dredged material placement practices for the Matagorda Ship Channel. The Galveston District should stay informed of the superfund solution and when solutions are determined, determine affects on dredging operations and implement a DMMP if required.

