
OCTOBER 1999

BREVARD COUNTY, FLORIDA SHORE PROTECTION PROJECT

LIMITED REEVALUATION REPORT



**U. S. ARMY CORPS
OF ENGINEERS**
Jacksonville District

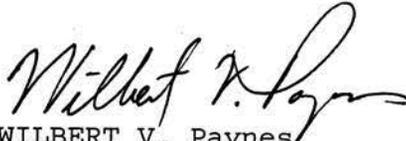
CESAD-ET-P (CESAJ-PD-PN/30 Nov 1999) (1105-2-10b) 1st End
Mr. McGovern/bjg/404-562-5226
SUBJECT: Brevard County Shore Protection Project

Commander, South Atlantic Division, U.S. Army Corps of Engineers,
Room 9M15, 60 Forsyth Street, SW. Atlanta, Georgia 30303-8801
26 January 2000

COMMANDER, JACKSONVILLE DISTRICT, ATTN: CESAJ-PD-PN

Subject LLR is approved.

FOR THE DIRECTOR OF ENGINEERING AND TECHNICAL SERVICES



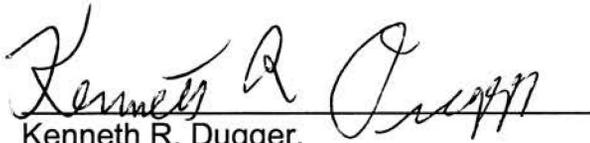
WILBERT V. Paynes
Chief, Planning and Environmental Division
Directorate of Engineering and
Technical Services

Encl
Nc

CF (wo/encl):
COMMANDER HQUSACE, ATTN: CECW-PE

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

The Jacksonville District has completed the Limited Revaluation Report for the Brevard County Shore Protection Project. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. The report and all associated documents required by the National Environmental Policy Act have been fully reviewed.



Kenneth R. Dugger,
Chief, Environmental Coordination
Section
Environmental Branch
Planning Division

2 Nov 1999
Date



David V. Schmidt,
Chief, Coastal/Navigation Section
Plan Formulation Branch
Planning Division

Nov 2, 1999
Date

CERTIFICATION OF LEGAL REVIEW

The Limited Revaluation Report for the Brevard County Shore Protection Project has been fully reviewed by the Office of Counsel, USAED Jacksonville, and is legally sufficient.

 11/3/99
Assistant District Counsel Date

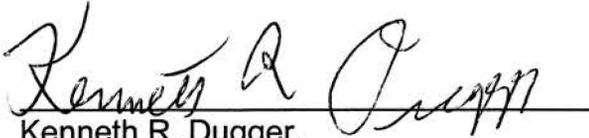
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 Assistant District Counsel 11/13/99
Date

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**BREVARD COUNTY, FLORIDA
SHORE PROTECTION PROJECT**

**OCTOBER 1999
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SHORE PROTECTION PROJECT**

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LIMITED REEVALUATION REPORT**

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**BREVARD COUNTY, FLORIDA
SHORE PROTECTION PROJECT**

**OCTOBER 1999
LIMITED REEVALUATION REPORT**

I. PROJECT AUTHORITY

1. This Limited Reevaluation Report (LRR) provides an update of the unconstructed Brevard County, Florida, Shore Protection Project (SPP) which was authorized by the Water Resources Development Act of 1996. The authorized project provides for initial construction and periodic nourishment of two reaches of the Brevard County shoreline. The North Reach consists of the 9.4 miles of shoreline extending from the south jetty at Canaveral Harbor to the northern limit of Patrick Air Force base located at Florida Department of Environmental Protection monument R-53. The South Reach of the project is approximately 3.4 miles long extending from FDEP monument R-119 to R-137.5. Both reaches consist of project design templates with berm elevations of +10.00 feet (referenced to the location of mean low water).

II. PURPOSE OF REPORT

2. This LRR was prepared in response to the Headquarters, U.S. Army Corps of Engineers (CECW-AR) request for documentation of project developments subsequent to authorization in 1996. The LRR documents 1) project refinements which include development of an access lane (into the original borrow area), alternative borrow areas and Nearshore Disposal and Sand Re-handling Area (NDSRA), 2) the updated project description, 3) current benefit-to-cost ratio and 4) updated cost allocation. An additional borrow area was developed following project authorization in order to increase the contractor's construction options. The rehandling area located adjacent to the southern portion of the North Reach was developed to eliminate the need for time consuming and hazardous vessel mooring and subsequent pump-out of dredged material to the beach. The cross shore limits of the project have been further defined relative to the pre-sand bypassing shoreline. Updated project costs (considering existing volume requirements) are presented in a subsequent section of this report along with associated project benefits to identify the current project benefit-to-cost ratio. Current shoreline ownership and use have been reevaluated to quantify Federal and non-Federal cost allocation in light of the required public use easements. Ultimately, the goal of the LRR is to show that Federal participation in the construction and renourishment of the Brevard County SPP continues to be economic justified.

III. PROJECT REFINEMENTS - ACCESS LANE, ALTERNATIVE BORROW AREAS AND NEARSHORE DISPOSAL AND SAND RE-HANDLING AREA (NDSRA)

3. Access Lane. An access lane to the original borrow area (Borrow Area I) has been developed because of the relatively shallow depths of the area and its considerable distance from the beach fill area. Use of shallow draft (small capacity) hopper dredges and/or lengthy deployment of pipeline would be required. This would result in potentially higher costs and increased construction time. Accordingly, and to permit contractors the opportunity to more efficiently and economically construct this shore protection project, the access lane was developed to reduce construction time and costs.

4. Alternative Borrow Areas. The Alternative borrow areas (Borrow Area II and Space Coast Shoals) are located across ambient water depths of -25 to -49 ft below mean low water (MLW) and can accommodate large-capacity hopper dredges. Use of these alternative borrow sources would be most efficiently used in combination with a proposed NDSRA. The NDSRA is an optional but important project feature which would permit sand dredged from offshore borrow areas to be strategically placed and subsequently dredged for use in project construction. However, the modification of the project plan to add the Borrow Area I access lane; Borrow Areas II and Space Coast Shoals to the Brevard County SPP is considered essential to efficiently construct the project. All project features discussed above are shown in Figure 1.

5. Figure 2 shows the location and limits of the recently identified access lane at the deepest-cut portion of the borrow area. Geotechnical information indicates that most of the sand to be dredged from the access lane is suitable for beach placement. Material determined to be unsuited for beach nourishment shall be placed 1) within the existing limits of the Canaveral Harbor nearshore disposal area offshore of Cocoa Beach if it contains less than 20% fines or 2) within the existing limits of the Canaveral Harbor offshore disposal area.

6. Figure 3 shows Borrow Area II located along the eastern edge of Canaveral Shoals, in federal waters of the Atlantic Ocean. The existing bathymetry, proposed dredging limits and site coordinates are shown in Figure 3. The core borings and sediment analysis indicate that the surficial beach quality sand deposit is 9 to 15 feet thick. The total volume of beach quality sand available within the site is estimated to be 34 million cubic yards (mcy) but the proposed dredging activity involves only 4.5 mcy. The sand is coarse relative to the local beach sand.

7. Figure 4 shows the Space Coast Shoals (SCS) borrow area located between Patrick Air Force Base and the City of Indialantic about 6,200 to 9,200 feet from the shoreline. Water depths over the shoal range from 42 to 48 feet (MLW). The existing bathymetry, proposed dredging limits and site coordinates are shown in Figure 4. The core borings and sediment analysis indicate that the

surficial beach-quality sand deposit is 7 to 20 feet thick. The total volume of beach quality sand available within the site is estimated to be 3.5 mcy. The sand is coarse relative to the local beach sand.

8. Nearshore Disposal and Sand Rehandling Area. The NDSRA was developed to expedite construction and reduce costs associated with the Federally authorized Brevard County SPP. This optional project feature would permit sand dredged from the project's offshore borrow areas to be placed as a berm within the NDSRA and subsequently dredged and used for SPP construction.

9. The purpose of the NDSRA is to provide an option to possibly eliminate the use of conventional "pump-out" equipment by which scows or hoppers must moor to a nearshore platform, hook-up to a pipeline to shore, and pump the sand to the beach. This "pump-out" approach is time consuming and readily shut-down by bad weather. This is of particular concern because 1) beach fill placement is limited to winter (storm) months, and 2) the size of the hoppers or scows will likely be small (and more prone to weather) because of limited borrow area water depths. In contrast, the rehandling option allows hoppers or scows to simply navigate to the site and release their sand load without cumbersome or weather-dependent hook-ups to a pipeline. The potential cost and time savings of the re-handling option are predicted to offset the greater requisite dredging quantities i.e., those associated with losses and the 2 foot "buffer" of sand atop the ambient seabed.

IV. NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION

10. National Environmental Policy Act coordination to address the additional borrow areas and the rehandling area has been completed and has resulted in the Finding of No Significant Impact (FONSI). Both the National Marine Fisheries and the U.S. Fish and Wildlife Service have concurred that there will be no adverse effects on threatened and endangered species from the proposed use of these areas. Treatment of eligible historic resources (if found in any of these areas) would be coordinated with the State Historic Preservation Officer and other agencies as required by law. In light of these findings, Colonel Joe R. Miller (U.S. Army District Engineer, Jacksonville District) signed a FONSI for Borrow Area I Access Lane, Space Coast Shoals Borrow Area and Borrow Area II on October 14, 1999. Colonel Miller also signed a FONSI for the Nearshore Disposal and Sand Re-Handling Area on that same date.

V. UPDATED PROJECT DESCRIPTION

11. The authorized shore protection project for Brevard County (as described in the Chief of Engineers Report for the Brevard County SPP dated 23 December 1996) provides for a 0-foot berm extension referenced to the pre-project mean high water (MHW) shoreline. The design berm is to be established at an elevation of +10.0 feet above MLW. The design berm is to tie into the pre-project

+10.00 foot MLW contour. The project design section is to transition from the location of MHW at a slope of 1/15 out to MLW, thence on a slope of 1/50 to the existing bottom.

12. Sand placed landward of the MHW shoreline (from the pre-project MHW shoreline to the intersection with the +10.0 foot contour) was to be a 100% non-Federal responsibility. The standard real estate easement being acquired for construction of the project calls for construction and public access to all of the lands where sand is to be placed on a perpetual basis. To accommodate the requirements of the easement, the landward limit of the Federal project has been redefined as the pre-project +10.00 foot MLW contour. The implications of this distinction in regards to project cost allocation are discussed in the "Updated Project Cost Allocation" section of this report.

13. During the preparation of the feasibility report, the berm break (the point where the vertical limits of the design template change from a level berm to a slope of 1 V on 15 H) was assumed to occur at the location of the pre-project MHW shoreline along the entire length of the project. Subsequent to the completion of the feasibility report and ultimate project authorization, sand has been bypassed from north of Canaveral Harbor (as mitigation for the impacts of the Federal navigation project). This sand was placed on the North Reach of the project between R-1 and R-14. To ensure that the sand-bypass project is located seaward of the SPP, the pre-bypass MHW shoreline has been established as the location of the design template berm break from R-1 through R-14. Elsewhere, the berm break is to be coincident with the pre-project shoreline which is taken as the location of the erosion control line (ECL). The ECL will be legally established prior to project construction. Project lands located seaward of the ECL will belong to the State of Florida while privately owned lands located landward of the ECL will remain in private ownership.

VI. UPDATED COST-TO-BENEFIT RATIO

14. Table 1 displays the pertinent project data as presented in the Brevard County SPP feasibility report. Table 2 displays updated project data based upon current estimates of fill volume requirements, project costs and project benefits. The estimated initial construction fill volume has increased from 2,500,000 to 2,830,000 cy. The increase in fill volume is due to erosion along the project area since completion of the feasibility phase coupled with the increased accuracy of plans and specification scope beach profile surveys in the quantification of volume requirements. The estimated cost for initial construction of the project's North Reach has increased from \$18,126,000 to \$24,533,000 while it has decreased for the South Reach from \$22,494,000 to \$14,177,000. The decrease in the cost of the South Reach is a result of the development of the Space Coast Shoals borrow area. The decreased haul distance to the South Reach from the Space Coast Shoals as compared to Canaveral Shoals has enabled a reduction in the estimated unit cost of placing sand on the beach from \$10.02/cy to \$6.39/cy. Initial construction cost has therefore decreased by \$1,910,000 from \$40,620,000

to \$38,710,000. The average annual equivalent cost of the North Reach has increased from \$2,199,000 to \$2,576,000 while it has decreased for the South Reach from \$2,971,000 to \$1,823,000.

15. As mentioned above, cost sharing of fill placed on private lands landward of the pre-project mean high water shoreline was assumed at 100% non-Federal in the Chief of Engineers report for the Brevard County SPP. Storm damage reduction benefits presented in the Chief of Engineers report were based upon the total volume of fill required to establish and maintain the 0-foot design template relative to the location of the pre-project mean high water shoreline. Therefore, the real estate easements being acquired for the project do not affect the cross shore orientation of the authorized project design template. Also, the Brevard County Tax Assessor's office recently indicated that the value of upland development considered in the feasibility phase of the project have risen since project authorization. Therefore, storm damage benefits of the project have conservatively been assumed to have remained at their pre-authorization level. Also, it is a conservative assumption that the recreational benefits of the project have remained at least at their pre-authorization level. This assumption is made in light of the fact that the real estate easements being acquired for the project result in a significant increase in land accessible to the public. The average annual equivalent project benefit associated with the North Reach of the project is therefore taken as \$4,116,000 while that for the South Reach is \$3,301,000. Given the current estimated average annual equivalent cost of the North Reach and South Reach (\$2,576,000 and \$1,823,000, respectively), the benefit-to-cost ratio for North Reach has decreased from 1.9 to its current value of 1.6 and for the South Reach has increase from 1.1 to an estimated value of 1.8.

VII. UPDATED PROJECT COST ALLOCATION

16. Allocation of project costs have been reevaluated based on current land ownership and use along the north and South Reaches of the project. In both reaches, the Federal cost share has increased due to the recent development of previously vacant parcels and the inclusion of fill placed landward of the ECL as a cost sharable item. For the purposes of reevaluating allocation of project costs, it has been assumed that all of the required real estate easements will be secured by the non-Federal sponsor prior to execution of the Project Cooperation Agreement. The Federal cost share for the North Reach has increased by 9.04% from 53.10% to 62.14%. For the South Reach, the Federal cost share has gone from 52.70% to 56.31% resulting in an increase of 3.61%. Table 3 and Table 4 display cost allocation as determined during the feasibility phase of the project and the current estimates, respectively.

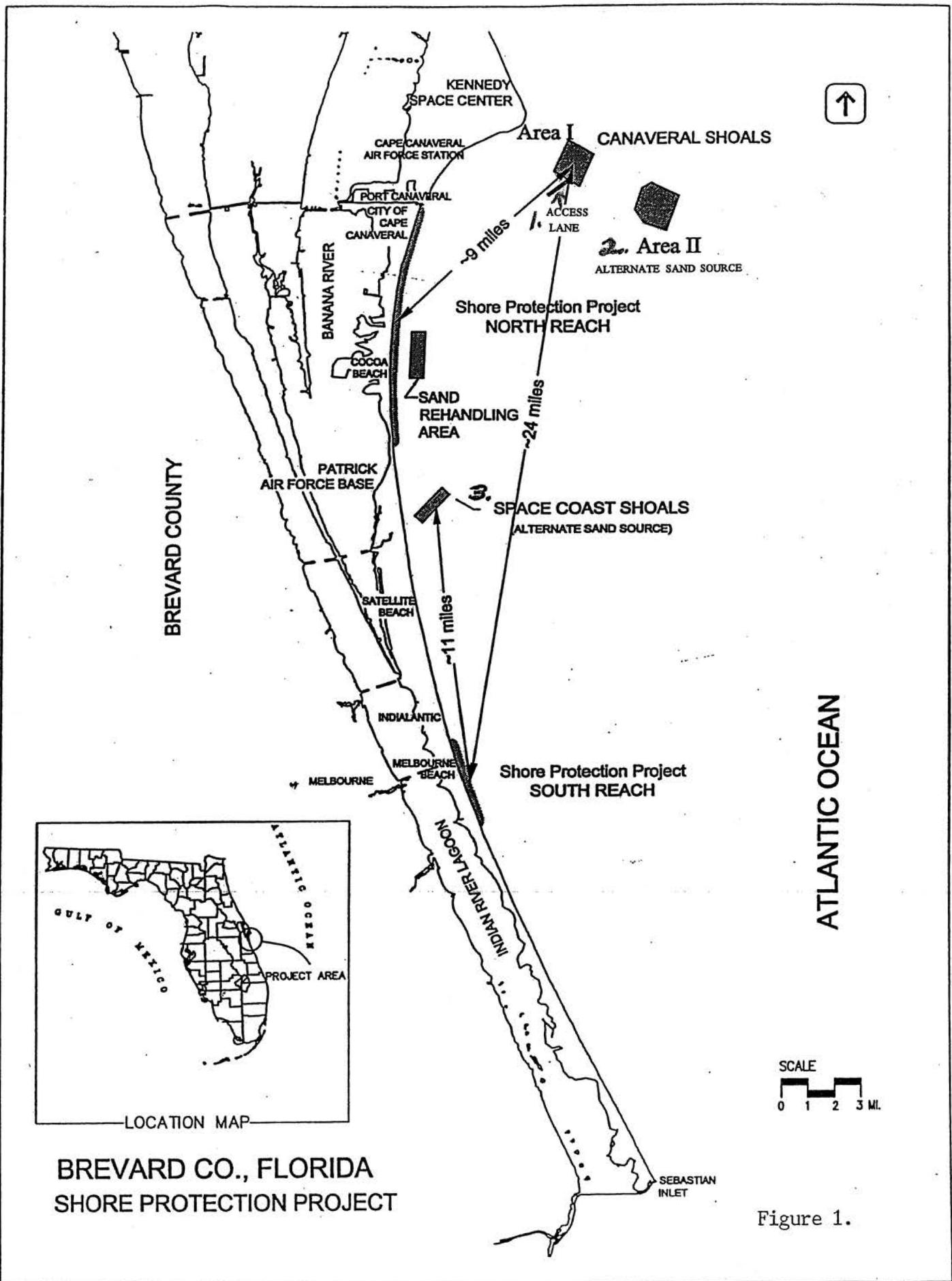
17. The North Reach is comprised of 49,568 feet of shoreline extending from R-1 adjacent to the Canaveral Harbor south jetty to the northern limit of Patrick Air Force Base at R-53 (see Table 5 for breakdown of shoreline ownership). Development of 18 parcels located along the North Reach shoreline, demolition of 1 structure and reclassification of 2 parcels from private undeveloped to public

developed lands accounts for a net increase of 3.15% in the Federal cost share. Federal participation in the cost of placing sand landward of the ECL accounts of the remaining 5.89% of the total 9.04% increase in the Federal cost share. The fill landward of the ECL was not considered a cost shared item in the feasibility report cost apportionment.

18. The South Reach is comprised of 16,784 feet of shoreline extending from R-119 to R-137.5 (see Table 5 for breakdown of shoreline ownership). Development of 3 parcels located along the South Reach shoreline and reclassification of 23 parcels from private developed to public developed lands accounts for a net decrease of -1.95% in the Federal cost share. Federal participation in the cost of placing sand landward of the ECL accounts of an increase of 5.56% for a net increase of 3.61% in the Federal cost share. The fill landward of the ECL was not considered a cost shared item in the feasibility report cost apportionment. Reassessment of land ownership and use along 1,695 foot of shoreline extending south from Turtle Park in Indianalantic Beach revealed the misclassification of the land (during the feasibility phase of the project) as private developed. In reality, this portion of shoreline (which had previously been considered as 23 separately owned parcels of land) actually consists of public beach with associated access and parking.

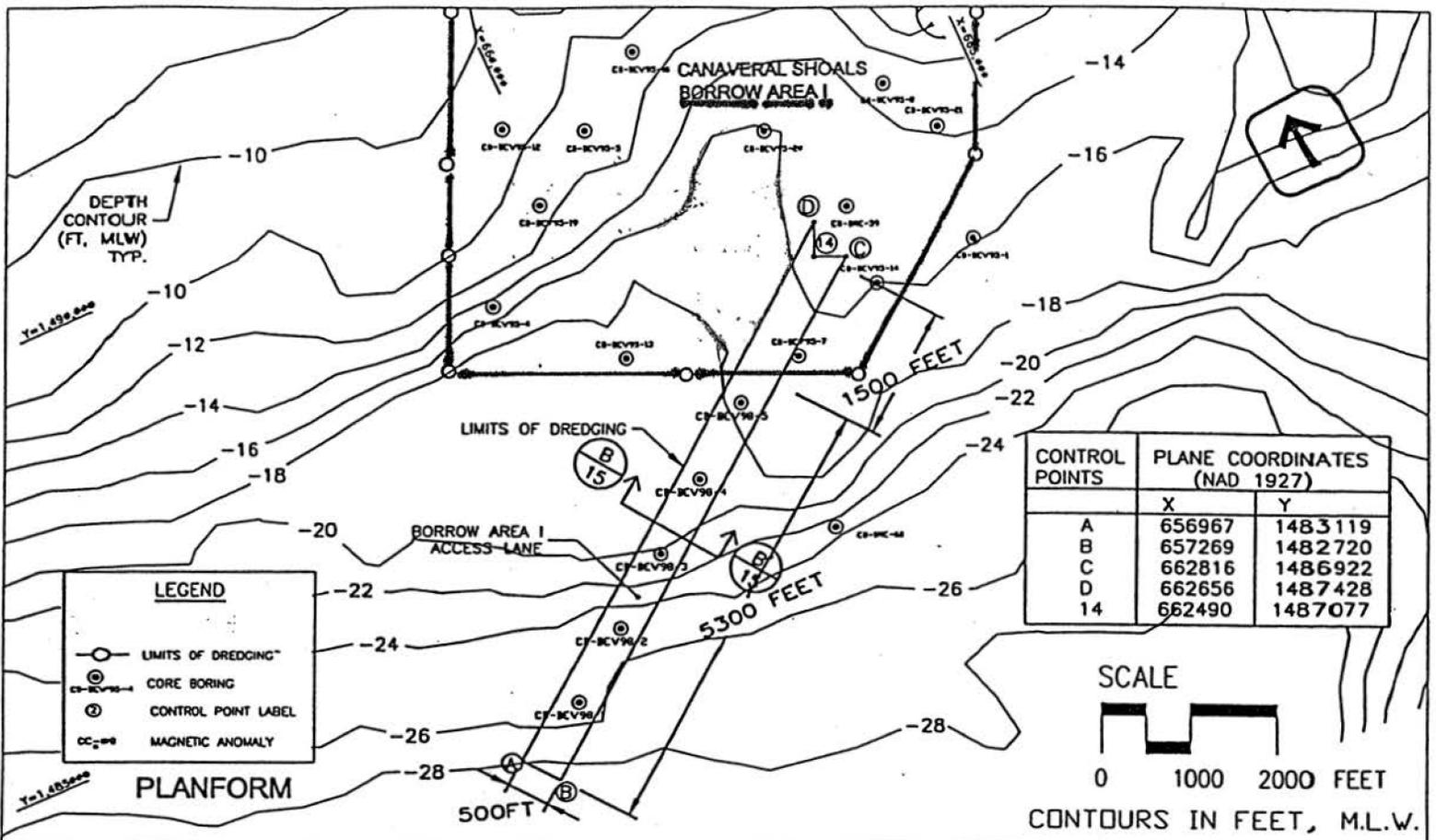
VIII. CONCLUSIONS

19. Federal participation in cost sharing of the construction and periodic renourishment of the Federally authorized Brevard County Shore Protection Project continues to be justified. The benefit-to-cost ratio for the North and South reaches of the project are currently 1.6 to 1.0 and 1.8 to 1.0, respectively. Federal cost allocation base upon current land ownership an use would be 62.14% for the North Reach and 56.31% for the South Reach. Therefore, the project initial construction cost of \$39,045,000 (includes \$335,000 for monitoring) would be cost shared \$23,423,000 Federal and \$15,622,000 Non-Federal.

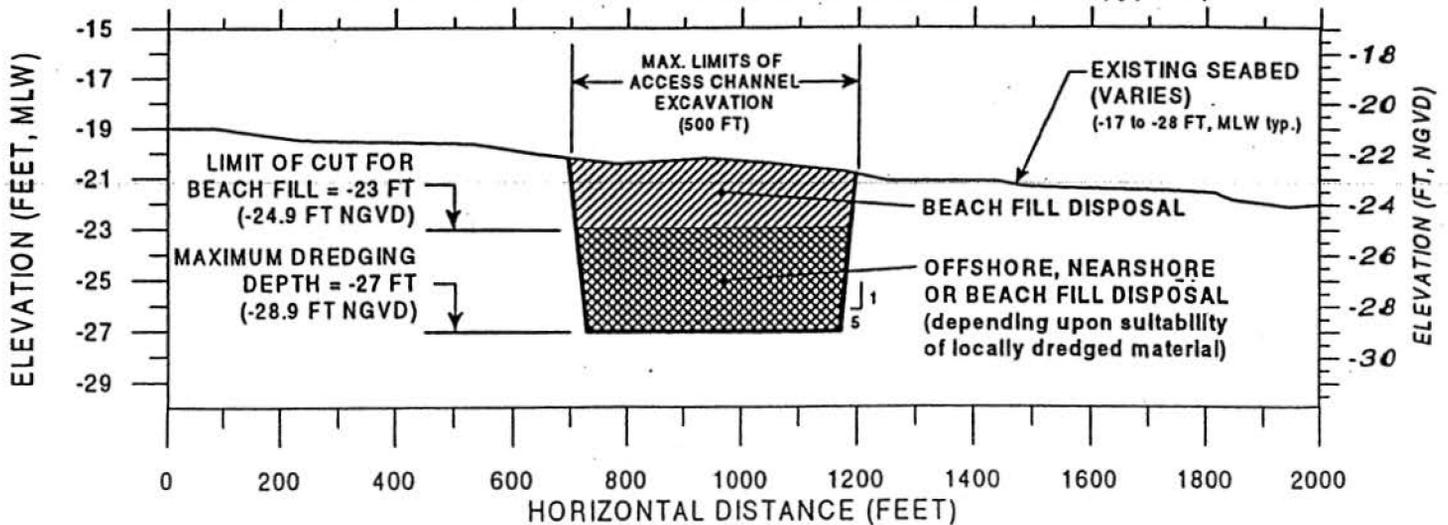


**BREVARD CO., FLORIDA
SHORE PROTECTION PROJECT**

Figure 1.



SECTION B-B': BORROW AREA ACCESS CHANNEL (typical)



NOT FOR PURPOSES OF CONSTRUCTION

BREVARD COUNTY SHORE PROTECTION
PROJECT-NORTH REACH

OFFSHORE BORROW AREA I
ACCESS LANE

APPROVED REVISION DATE:

Figure 2.

DRAWN BY:

S.H.

SHEET



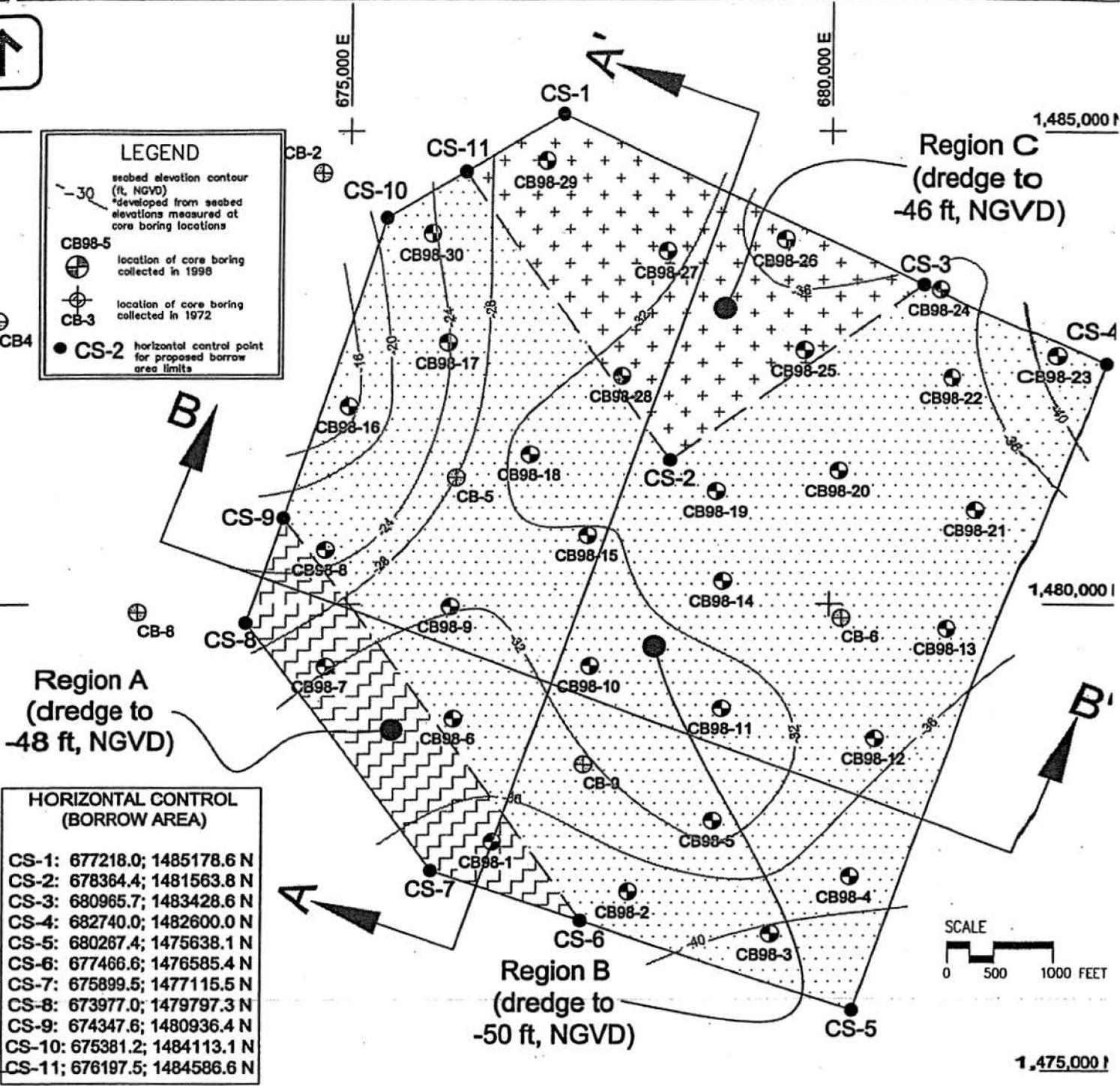
LEGEND

seabed elevation contour (ft, NGVD)
*developed from seabed elevations measured at core boring locations

CB98-5
location of core boring collected in 1998

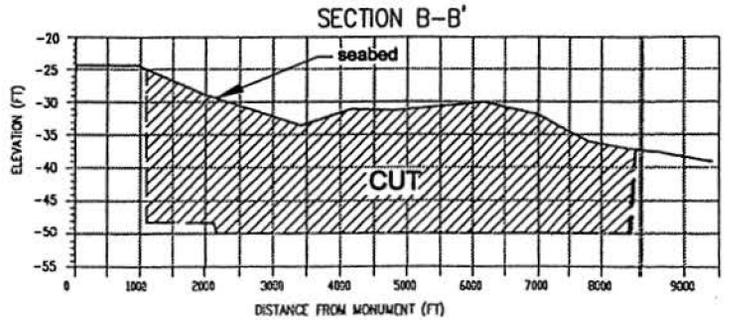
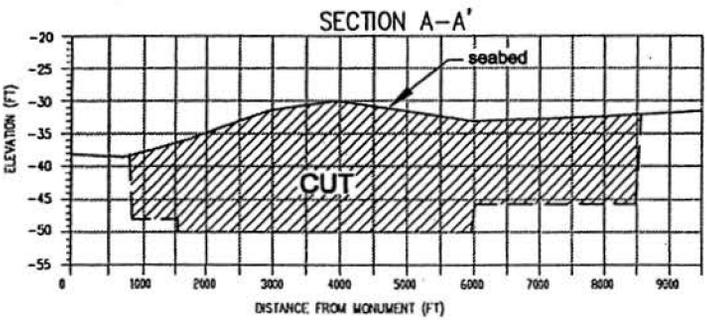
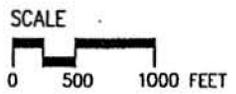
CB-3
location of core boring collected in 1972

CS-2
horizontal control point for proposed borrow area limits



HORIZONTAL CONTROL (BORROW AREA)

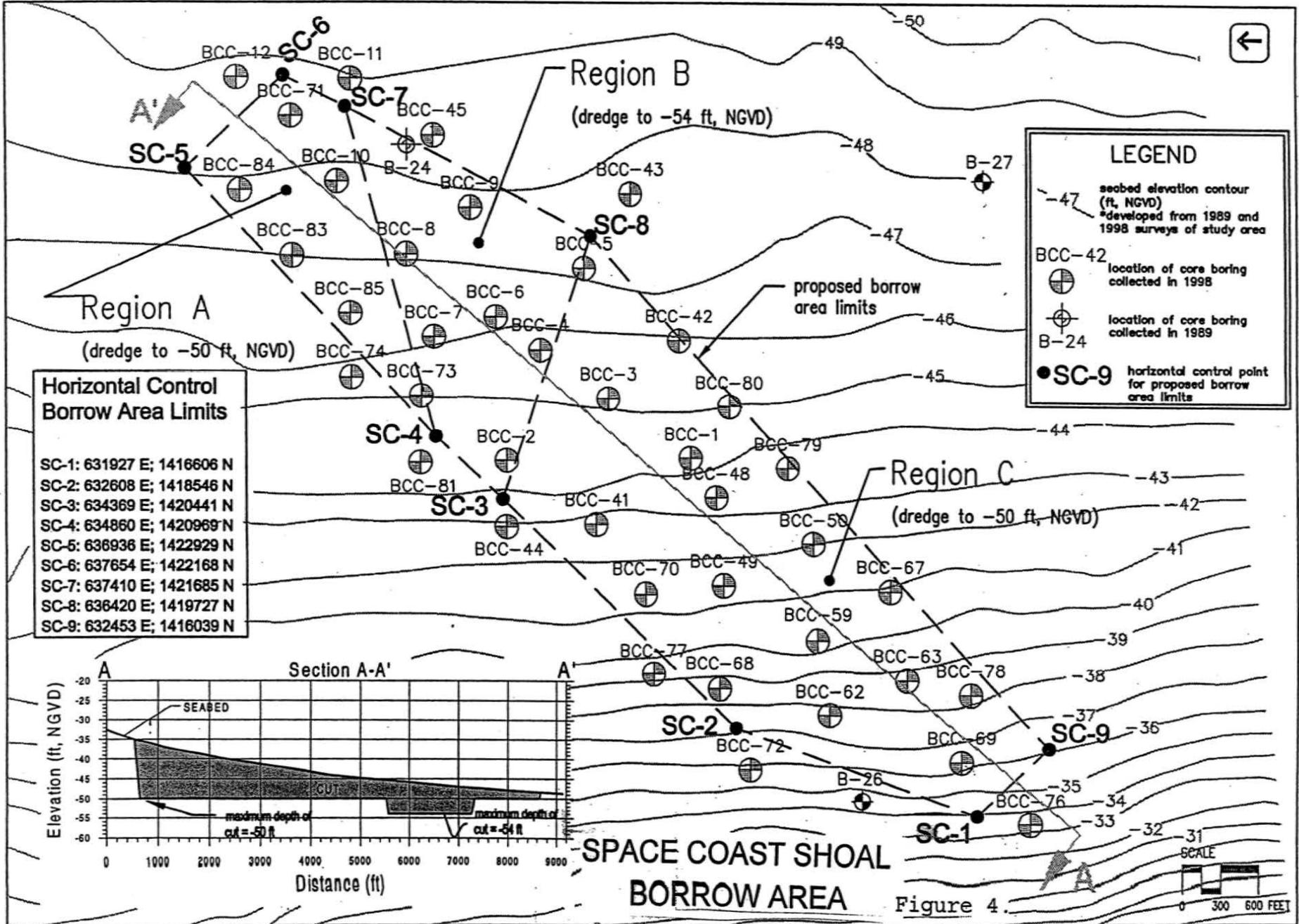
CS-1:	677218.0;	1485178.6 N
CS-2:	678364.4;	1481563.8 N
CS-3:	680965.7;	1483428.6 N
CS-4:	682740.0;	1482600.0 N
CS-5:	680267.4;	1475638.1 N
CS-6:	677466.6;	1476585.4 N
CS-7:	675899.5;	1477115.5 N
CS-8:	673977.0;	1479797.3 N
CS-9:	674347.6;	1480936.4 N
CS-10:	675381.2;	1484113.1 N
CS-11:	676197.5;	1484586.6 N



**BREVARD COUNTY
SHORE PROTECTION PROJECT
CANAVERAL SHOALS**

DATE:	APPROVED	REVISION	DATE:
DRAWN BY:			

Figure 3.



LEGEND

- 47 seabed elevation contour (ft, NGVD) *developed from 1989 and 1998 surveys of study area
- BCC-42 location of core boring collected in 1998
- B-24 location of core boring collected in 1989
- SC-9 horizontal control point for proposed borrow area limits

Horizontal Control Borrow Area Limits

SC-1:	631927 E;	1416606 N
SC-2:	632608 E;	1418546 N
SC-3:	634369 E;	1420441 N
SC-4:	634860 E;	1420969 N
SC-5:	636936 E;	1422929 N
SC-6:	637654 E;	1422168 N
SC-7:	637410 E;	1421685 N
SC-8:	636420 E;	1419727 N
SC-9:	632453 E;	1416039 N

Region A
(dredge to -50 ft, NGVD)

Region B
(dredge to -54 ft, NGVD)

Region C
(dredge to -50 ft, NGVD)

SPACE COAST SHOAL BORROW AREA

Figure 4.

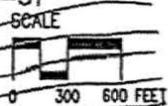


TABLE 1:
 BREVARD COUNTY SHORE PROTECTION PROJECT
 REVIEW STUDY
 PERTINENT DATA

PHYSICAL DATA (All elevations referenced to MLW)		
	NORTH REACH	SOUTH REACH
Project Length [mi]	9.4	3.4
Berm Crest Elevation [ft]	10.0	10.0
Berm Width Extension from ECL [ft]	0	0
Foreshore Slope	1 V to 15 H	1 V to 15 H
Nearshore Slope	1 V to 50 H	1 V to 50 H
Background Erosion Rate [cy/yr]	190,000	33,000
Post-placement Erosion Rate [cy/yr]	244,000	100,000
Supplemental Advance Nourishment Rate [cy/yr]	86,000	100,000
Volume of Initial Fill [cy]	2,500,000	1,645,000
Volume of Design Fill [cy]	1,984,000	1,044,000
Volume of Advance Nourishments [cy]	516,000	601,000
Nourishment Interval [yr]	6	6
FINANCIAL DATA (Interest Rate = 7.625%)		
	NORTH REACH	SOUTH REACH
INITIAL CONSTRUCTION COST	\$18,126,000	\$22,494,000
EACH FUTURE NOURISHMENT COST	\$4,895,000	\$8,529,000
ANNUAL PROJECT COSTS		
Interest and Amortization		
Initial Construction	\$1,400,000	\$1,688,000
Future Nourishment	\$663,000	\$1,157,000
Interest During Construction	\$78,000	\$98,000
Project Monitoring	\$58,000	\$28,000
Subtotal	\$2,199,000	\$2,971,000
PRIMARY BENEFITS		
	NORTH REACH	SOUTH REACH
Prevention of Damage to Upland Development	\$2,622,000	\$3,174,000
Coastal Armor	\$128,000	\$5,000
Backfill	\$20,000	\$0
Loss of Land	\$362,000	\$0
Subtotal	\$3,132,000	\$3,179,000
INCIDENTAL BENEFITS (Recreation)	\$984,000	\$122,000
TOTAL PROJECT BENEFITS	\$4,116,000	\$3,301,000
BENEFIT-TO-COST RATIO	1.9	1.1

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TABLE 2:
 BREVARD COUNTY SHORE PROTECTION PROJECT
 LIMITED REEVALUATION REPORT
 PERTINENT DATA

PHYSICAL DATA (All elevations referenced to MLW)		
	NORTH REACH	SOUTH REACH
Project Length [mi]	9.4	3.4
Berm Crest Elevation [ft]	10.0	10.0
Berm Width Extension from ECL [ft]	0	0
Foreshore Slope	1 V to 15 H	1 V to 15 H
Nearshore Slope	1 V to 50 H	1 V to 50 H
Background Erosion Rate [cy/yr]	190,000	33,000
Post-placement Erosion Rate [cy/yr]	244,000	100,000
Supplemental Advance Nourishment Rate [cy/yr]	86,000	100,000
Volume of Initial Fill [cy]	2,830,000	1,645,000
Volume of Design Fill [cy]	2,314,000	1,044,000
Volume of Advance Nourishments [cy]	516,000	601,000
Nourishment Interval [yr]	6	6
FINANCIAL DATA (Interest Rate = 6.875%)		
	NORTH REACH	SOUTH REACH
INITIAL CONSTRUCTION COST	\$24,533,000	\$14,177,000
EACH FUTURE NOURISHMENT COST	\$4,823,000	\$5,216,000
ANNUAL PROJECT COSTS		
Interest and Amortization		
Initial Construction	\$1,750,000	\$1,011,000
Future Nourishment	\$673,000	\$728,000
Interest During Construction	\$99,000	\$58,000
Project Monitoring	\$54,000	\$26,000
Subtotal	\$2,576,000	\$1,823,000
PRIMARY BENEFITS		
	NORTH REACH	SOUTH REACH
Prevention of Damage to Upland Development	\$2,622,000	\$3,174,000
Coastal Armor	\$128,000	\$5,000
Backfill	\$20,000	\$0
Loss of Land	\$362,000	\$0
Subtotal	\$3,132,000	\$3,179,000
INCIDENTAL BENEFITS (Recreation)	\$984,000	\$122,000
TOTAL PROJECT BENEFITS	\$4,116,000	\$3,301,000
BENEFIT-TO-COST RATIO	1.6	1.8

NOTE: CHANGES SINCE AUTHORIZATION SHOWN IN BOLD TEXT.

TABLE 3:
 BREVARD COUNTY SHORE PROTECTION PROJECT
 REVIEW STUDY
 INITIAL CONSTRUCTION

FIRST COST	NORTH REACH	SOUTH REACH
Initial Construction	\$17,892,000	\$22,372,000
Project Monitoring	\$234,000	\$122,000
TOTAL	\$18,126,000	\$22,494,000
INVESTMENT COST		
First Cost	\$18,126,000	\$22,494,000
Interest During Construction	\$998,000	\$125,000
TOTAL	\$19,124,000	\$22,619,000
PROJECT COST SHARING [FIRST COST]	NORTH REACH	SOUTH REACH
Percent [%]		
Federal	53.1	52.7
Non-Federal	46.9	47.3
Dollars [\$]		
Federal	\$9,625,000	\$11,854,000
Non-Federal	\$8,501,000	\$10,640,000
TOTAL	\$18,126,000	\$22,494,000

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BREVARD COUNTY SHORE PROTECTION PROJECT
 LIMITED REEVALUATION REPORT
 INITIAL CONSTRUCTION

FIRST COST	NORTH REACH	SOUTH REACH
Initial Construction	\$24,533,000	\$14,177,000
Project Monitoring	\$220,000	\$115,000
TOTAL	\$24,753,000	\$14,292,000
INVESTMENT COST		
First Cost	\$24,753,000	\$14,292,000
Interest During Construction	\$1,268,000	\$740,000
TOTAL	\$26,021,000	\$15,032,000
PROJECT COST SHARING [FIRST COST]	NORTH REACH	SOUTH REACH
Percent [%]		
Federal	62.1	56.3
Non-Federal	37.9	43.7
Dollars [\$]		
Federal	\$15,382,000	\$8,048,000
Non-Federal	\$9,371,000	\$6,244,000
TOTAL	\$24,753,000	\$14,292,000

NOTE: CHANGES SINCE AUTHORIZATION SHOWN IN BOLD TEXT.

TABLE 5: SHORELINE OWNERSHIP			
	NORTH REACH		
	Total	Length	Length
	Length	Federal	Non-Federal
Private/Developed	44,218	28,709	15,509
Street Ends	2,370	1,541	830
Public/Developed	1,101	551	551
Private/Undeveloped	1,879	0	1,879
TOTAL	49,568	30,800	18,768
	SOUTH REACH		
	Total	Length	Length
	Length	Federal	Non-Federal
Private/Developed	10,763	6,996	3,767
Street Ends	630	410	221
Public/Developed	4,091	2,046	2,046
Private/Undeveloped	1,300	0	1,300
TOTAL	16,784	9,451	7,333

APPENDIX A

MCACES COST ESTIMATE (OCTOBER 1999)

Wed 27 Oct 1999
Eff. Date 10/15/99

U.S. Army Corps of Engineers
PROJECT BBF001: Brevard County BEC - Comp Est

TIME 13:57:53

TITLE PAGE 1

Brevard County BEC - Comp Est

Designed By: Jacksonville District Office
Estimated By: M Fascher

Prepared By: M Fascher

Preparation Date: 10/15/99
Effective Date of Pricing: 10/15/99

Sales Tax: 6.00%

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DESCRIPTION OF WORK: The project is located in Brevard County and consists of renourishment of a north reach and a south reach. 1,650,000 cy would be placed on the south reach and 2,830,000 cy on the north reach. The two estimates shown are the same except that one allows a second borrow area for the north reach. It is assumed that this would allow the contractor to finish the north reach in one dredging season so this option would take 2 years total instead of the 3 years total for the other option.

Contingencies of 10% have been used for this estimate based on the fact that plans and specs level design has been completed.

E&D and S&A are included at the direction of the project manager. Percentages of 8% and 10% respectively were used except for the initial construction where we know what the E&D are.

Wed 27 Oct 1999

U.S. Army Corps of Engineers

TIME 13:57:53

Eff. Date 10/15/99

PROJECT BBF001: Brevard County BEC - Comp Est

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No Detailed Estimate...

No Backup Reports...

* * * END TABLE OF CONTENTS * * *

Wed 27 Oct 1999

U.S. Army Corps of Engineers

TIME 13:57:53

Eff. Date 10/15/99

PROJECT BBF001: Brevard County BEC - Comp Est

SUMMARY PAGE 1

** PROJECT OWNER SUMMARY - Contract **

QUANTITY UOM CONTRACT CONTING TOTAL COST UNIT COST

03	Bch Nourishment w/2 North B/As	35,260,017	3,446,002	38,706,019	
04	Bch Nourishment w/1 North B/As	33,240,661	3,244,066	36,484,727	
05	Bch Renourishment North Beach	4,412,118	411,312	4,823,430	
06	Bch Renourishment South Beach	4,689,124	436,912	5,126,037	

** PROJECT OWNER SUMMARY - SubFeatu **

		QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

03 Bch Nourishment w/2 North B/As							
03- A Construction Cost							
03- A/ A Base Bid-North Bch							
03- A/ A.01	Mobilization and Demobilization			3,184,015	318,401	3,502,416	
03- A/ A.02	BEACH FILL (Estimated Quantity)	2830000	CY	16,534,000	1,653,400	18,187,400	6.43
03- A/ A.03	BEACH TILLING	110.00	AC	41,135	4,114	45,249	411.35
03- A/ A.04	CONST/VIBRATION CONTOLS & MONITR			135,149	13,515	148,664	
03- A/ A.05	LIGHTED AIDS TO NAVIGATION			50,000	5,000	55,000	
TOTAL Base Bid-North Bch				19,944,299	1,994,430	21,938,729	

03- A/ B Optional Bid Item A-South bch							
03- A/ B.06	Mobilization and Demobilization			1,630,837	163,084	1,793,921	
03- A/ B.07	BEACH FILL (Estimated Quantity)	1645000	CY	9,554,400	955,440	10,509,840	6.39
03- A/ B.08	BEACH TILLING	41.00	AC	15,332	1,533	16,866	411.35
03- A/ B.09	CONST/VIBRATION CONTOLS & MONITR			135,149	13,515	148,664	
03- A/ B.10	LIGHTED AIDS TO NAVIGATION			50,000	5,000	55,000	
TOTAL Optional Bid Item A-South bch				11,385,718	1,138,572	12,524,290	
TOTAL Construction Cost				31,330,017	3,133,002	34,463,019	

03- B Non-Construction Cost							
03- B/30	Planning, Engineering and Design			800,000	0	800,000	
03- B/31	Construction Management (S&I)			3,130,000	313,000	3,443,000	
TOTAL Non-Construction Cost				3,930,000	313,000	4,243,000	
TOTAL Bch Nourishment w/2 North B/As				35,260,017	3,446,002	38,706,019	

04 Bch Nourishment w/1 North B/As							
04- A Construction Cost							
04- A/ A Base Bid-North Bch							
04- A/ A.01	Mobilization and Demobilization			3,002,811	300,281	3,303,092	
04- A/ A.02	BEACH FILL (Estimated Quantity)	2830000	CY	14,736,000	1,473,600	16,209,600	5.73
04- A/ A.03	BEACH TILLING	110.00	AC	41,135	4,114	45,249	411.35
04- A/ A.04	CONST/VIBRATION CONTOLS & MONITR			224,996	22,500	247,496	
04- A/ A.05	LIGHTED AIDS TO NAVIGATION	2.00	EA	100,000	10,000	110,000	55000.00

** PROJECT OWNER SUMMARY - SubFeatu **

		QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
TOTAL Base Bid-North Bch				18,104,943	1,810,494	19,915,437	
04- A/ B Optional Bid Item A-South Bch							
04- A/ B.06	Mobilization and Demobilization			1,630,837	163,084	1,793,921	
04- A/ B.07	BEACH FILL (Estimated Quantity)	1645000	CY	9,554,400	955,440	10,509,840	6.39
04- A/ B.08	BEACH TILLING	41.00	AC	15,332	1,533	16,866	411.35
04- A/ B.09	CONST/VIBRATION CONTOLS & MONITR			135,149	13,515	148,664	
04- A/ B.10	LIGHTED AIDS TO NAVIGATION			50,000	5,000	55,000	
TOTAL Optional Bid Item A-South Bch				11,385,718	1,138,572	12,524,290	
TOTAL Construction Cost				29,490,661	2,949,066	32,439,727	
04- B Non-Construction Cost							
04- B/30	Planning, Engineering and Design			800,000	0	800,000	
04- B/31	Construction Management (S&I)			2,950,000	295,000	3,245,000	
TOTAL Non-Construction Cost				3,750,000	295,000	4,045,000	
TOTAL Bch Nourishment w/1 North B/As				33,240,661	3,244,066	36,484,727	
05 Bch Renourishment North Beach							
05- A Construction Cost							
05- A/ A North Bch							
05- A/ A.01	Mobilization and Demobilization			1,501,405	150,141	1,651,546	
05- A/ A.02	BEACH FILL (Estimated Quantity)	352000.00	CY	2,054,100	205,410	2,259,510	6.42
05- A/ A.03	BEACH TILLING	15.00	AC	5,609	561	6,170	411.35
05- A/ A.04	CONST/VIBRATION CONTOLS & MONITR			78,003	7,800	85,803	
05- A/ A.05	LIGHTED AIDS TO NAVIGATION	2.00	EA	100,000	10,000	110,000	55000.00
TOTAL North Bch				3,739,118	373,912	4,113,030	
TOTAL Construction Cost				3,739,118	373,912	4,113,030	
05- B Non-Construction Cost							
05- B/30	Planning, Engineering and Design			299,000	0	299,000	
05- B/31	Construction Management (S&I)			374,000	37,400	411,400	
TOTAL Non-Construction Cost				673,000	37,400	710,400	
TOTAL Bch Renourishment North Beach				4,412,118	411,312	4,823,430	

** PROJECT OWNER SUMMARY - SubFeatu **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

06 Bch Renourishment South Beach						
06- A Construction Cost						
06- A/ A North Bch						
06- A/ A.01 Mobilization and Demobilization			1,121,137	112,114	1,233,251	
06- A/ A.02 BEACH FILL (Estimated Quantity)	312500.00	CY	2,689,375	268,938	2,958,313	9.47
06- A/ A.03 BEACH TILLING	15.00	AC	5,609	561	6,170	411.35
06- A/ A.04 CONST/VIBRATION CONTOLS & MONITR			78,003	7,800	85,803	
06- A/ A.05 LIGHTED AIDS TO NAVIGATION	2.00	EA	100,000	10,000	110,000	55000.00
			-----	-----	-----	
TOTAL North Bch			3,994,124	399,412	4,393,537	
			-----	-----	-----	
TOTAL Construction Cost			3,994,124	399,412	4,393,537	
06- B Non-Construction Cost						
06- B/30 Planning, Engineering and Design			320,000	0	320,000	
06- B/31 Construction Management (S&I)			375,000	37,500	412,500	
			-----	-----	-----	
TOTAL Non-Construction Cost			695,000	37,500	732,500	
			-----	-----	-----	
TOTAL Bch Renourishment South Beach			4,689,124	436,912	5,126,037	