6.0 PUBLIC INVOLVEMENT, PUBLIC COMMENTS AND RESPONSES

6.1 Summary of Public Comments on the Draft SEIS

This section provides information on the public involvement activities that occurred during the preparation of this Final Supplemental Environmental Impact Statement (FSEIS), as well as public comments received on the Draft SEIS and the Applicant's responses to those comments. The following table presents the chronology of public involvement leading up to the FSEIS.

Date	Public Involvement
July 3, 2001	Request for assistance defining project issues and concerns issued by the Jacksonville District U.S. Army Corps of Engineers, Regulatory Division, South Permits Branch, to be addressed in a Supplemental Environmental Impact Statement for Region III of the Coast of Florida Erosion and Storm Effects Study for the proposed Phipps Ocean Park Beach Restoration Project located within the Town of Palm Beach, Florida.
August 28, 2001	Notice of Intent (NOI) to prepare a Draft Supplemental Environmental Impact Statement (DSEIS) published, 66 Federal Register 45,291, August 28, 2001.
August 31, 2001	Copies of scoping letter and NOI distributed by letter dated 31 August 2001 to appropriate Federal, State, and local agencies, city and county officials, and interested general public.
October 15, 2001	DSEIS Scoping meeting conducted at U.S Environmental Protection Agency (EPA) Office, West Palm Beach, Florida.
November 14, 2001	Completion of Scoping Document, Phipps Ocean Park Beach Restoration Project, Draft SEIS, and release to federal commenting agencies.
August 23, 2002	Notice of Availability (NOA) of a Draft Supplemental Environmental Impact Statement (SEIS), for #200000380(IP–DEB), Phipps Ocean Park Beach Restoration Project, Town of Palm Beach, Palm Beach County, FL, 67 Federal Register 56,646, August 23, 2002.
August 26, 2002	Distribution of Draft SEIS document on USACE-Jacksonville District website and by regular U.S. mail to federal resource agencies, general public, SEIS scoping list, State and local elected officials, and interested parties. Document also noticed to be available in five local libraries and offices in Palm Beach County.

September 1, 2002	Copies of the Phipps Draft SEIS made available for inspection at: (1) Town of Palm Beach Clerk's, Office, Town Hall, 360 South County Road, Palm Beach, FL 33480; (2) Town of Palm Beach Public Works Department, 951 Old Okeechobee Road, West Palm Beach, FL 33401; (3) Town of Palm Beach Fire Rescue Station 3, 2185 South Ocean Blvd., Palm Beach, FL 33480; (4) USACE West Palm Beach Regulatory Office, 400 North Congress Avenue, Suite 130, West Palm Beach, FL 33401; and (5) Palm Beach County Government Center, Front Lobby Information Desk, 215 North Olive Avenue, West Palm Beach, FL 33401.
September 1, 2002	Newspaper publication of Public Notice #1 regarding "Public Meeting, moderated by the US Army Corps of Engineers, to discuss the proposed erosion control project known as the Phipps Ocean Park Beach Restoration Project and the Supplemental Environmental Impact Statement prepared for this project."
September 8, 2002	Newspaper publication of Public Notice #2 regarding "Public Meeting, moderated by the US Army Corps of Engineers, to discuss the proposed erosion control project known as the Phipps Ocean Park Beach Restoration Project and the Supplemental Environmental Impact Statement prepared for this project."
September 12, 2002	Phipps Draft SEIS Public Meeting, Council Chambers at 360 South County Road, Palm Beach, Florida, at 7:00 pm.
September 30, 2002	Public Comment Period extended by USACE.
October 7, 2002	Deadline for public comments on Draft SEIS.
October 31, 2002	Extended deadline for public comments on Draft SEIS.
January 28, 2003	Submission of Draft Final SEIS to USACE

6.1.1 Overview

The DSEIS was released for public review and comment in August 23, 2001. The 45-day comment period on the document originally ended October 7, 2001, but was extended upon request to October 31, 2001. The entire comment period was 70 days in duration. More than 60 people attended the public review meeting on the DSEIS held in the Town of Palm Beach on September 12, 2001 and oral comments were received from approximately one-half of the individuals in attendance. During the comment period, 86 written comments were received. These included comments from the public review meeting, individual letters, form letters and e-mails, organizational letters, and phone conversations.

6.1.2 Demographics

Comments on the DSEIS were primarily received from within the State of Florida; however, some out of State divers concerned about potential impacts to offshore reefs did submit comments by e-mail. The majority of the comments were from the Palm Beach County area, reflecting the local interest in the project. Of the 86 written comments received, comments came from: individuals (74), organizations (5), businesses (3), federal agencies (4), state government (1), and county government (1).

6.1.3 Comment Analysis Process

As a third party SEIS, all comments were received by the USACE-Palm Beach Regulatory Branch, logged in, and forwarded to Coastal Technology Corporation, the Third Party Contractor for the draft document. Comments were reviewed and read by the USACE staff and Coastal Tech. Draft comment responses were provided to the USACE staff for review, modification and final acceptance. All comments were treated as substantive and were summarized and assigned a Comment Code. Comments that addressed the adequacy of the Draft SEIS, or the merits of the alternatives, were more useful than comments that simply expressed support or opposition to one or more of the alternatives, or stated an opinion.

Some information in the DEIS was corrected or clarified based on public comments that contained recommendations for improving or updating the DEIS. In addition, information and recommendations provided by federal commenting agencies such as the National Marine Fisheries Service, Department of Interior, or the Environmental Protection Agency were carefully reviewed and considered.

Many commenters wrote their letters as a vote for one alternative or another or to express general opposition or support for beach nourishment as a shoreline erosion response strategy. As made clear by the USACE at the DSEIS Public Meeting, the request for public comment is not designed to be a voting process, but a way to review the adequacy of analysis methods and determine if there are factual errors, whether new alternatives, effects or mitigation measures should be considered; or whether there are substantive disagreements over the determination of significant effects. Although comments that addressed these concerns were responded to in more detail in the FSEIS, all comments were important to the decision-makers because they provided information on the opinions and preferences of those who have taken the time to comment.

6.1.4 Summary

The comments received on the Draft SEIS raised no original issues that had not been identified and addressed to some extent in the draft document. In part, this is likely due to the fact that the Project has previously undergone full evaluation and review by the FDEP in the process of issuing the State permit for the Project. Most commenters expressed an opinion for or against the proposed project without reference to a particular section of the document itself or to the sufficiency of the analysis in the Draft SEIS. While generalizations are difficult, the key issues of interest to the public, as reflected in the comments received, appeared to be: (1) the shoreline erosion conditions and need for the project; (2) project length and design, (3) protection of offshore hardbottom features, and (4) nearshore hard bottom features and the adequacy of the mitigation reef. Along with more secondary matters, these issues are summarized in the response to comments in this section of the FSEIS.

6.2 Index of Public Comments Received

This section includes an alphabetical list of the agencies, organizations, businesses, and persons who submitted comments on the DSEIS. The specific comments submitted by each entity or person are identified by reference to a Comment Code. A comment summary has been prepared for each Comment Code and the Applicants response to the Comment immediately follows the summary.

DSEIS Phipps Ocean Park Beach Restoration Project
List of Public Commenters and Index of Comments Submitted
12/10/2002

	Commenter	Index Code of Comment(s) Submitted
1	Abernathy, Jim	L2
2	Agaoglu, Sevket	L1
3	Axman, Jane	L2
4	Ayala, Bruce	F2, F4, L1
5	Bamford, Leah	L1
6	Bell, Steven	A10, D3, E2
7	Beros, Emis T.	A3
8	Betterley, Rich	L1
9	Blum, Elaine	L1
10	Byrnes, Carol M.	G2
11	Carpenter, Martin	L1
12	Coral Reef Society/Judy Schrafft	L1, L2, L3
13	Cowan, David J.	L1, L2
14	Davies, Stewart	L1
15	Diebel, Jr., John H.	L1
16	U.S. Environmental Protection Agency, Region 4, Heinz J. Mueller	B1, D14, E13, G6, L8, L9, P1, P9, P10, P11
17	Flamm, Alec	A2, E5

18	Florida Division of Historical Resources, Janet Snyder Matthews	B6
19	Frank, Gerald	E1
20	Fried, Billy	L1, F2
21	Gadigian, Carolyn	L1
22	Garren, Alfred	L1, L2
23	Gasque, Connie	A4, C2, D2, G1, K1, L1, M1, M2, O1, O2, O3, P1
24	Goldstein, Lee and Ida	A2
25	Greenblatt, Amy	L1
26	Guzman, Dorys	L1
27	Hajec, Mark	L1
28	Haynes, Fred	F1, L1
29	Ho, David	E3, E4, L1, M1
30	Hourican, Joan	E2
31	Hudson, Steve	L1
32	Humphreys, C. Robert, DC	B1, L1
33	Jacob, Robert and Maria	E3
34	Jeffcott, Jeanette	B1, L1
35	Jensen, Bob	B1, L1, F1
36	Johnson, Bob	B1, L1
37	Johnson, Kari	B1, F1, L1
38	Jones, Cheryl	B1, F3, L1, L2
39	Kenney, George	B1, L4
40	Kenney, Jr., George W.J.	L1
41	Kess, Gerald	A5, A6, F3
42	Keyes, Melissa	E3
43	Kieffer III, Victor B.	L1, L2
44	King, Don	B1, L1
45	Kleid, Richard	A7
46	Klem, Martin	A8
47	Knudsen, Michael	B1
48	Kuvin, Sanford	A9, A10, C2, D3
49	Lavoie, Donna	C3, F2, F3, F4, G1, L2
50	Law, Mike	A11, B1, B2, L1
51	Levine, Clarie M.	A5, E4
52	Lilja, Sten	B4, C1, H1, H2, H3, H4, H5, H6, M10
53	Marine Resources, Inc./Bruce Graham	E5, E6, E7, K3, K4, K5, K6, K7, P2, P3, P4, Q1
54	Martin, Drew	B1
55	Martino, Joel	C2, C4, C5
56	May, John "Tiny"	B1, L1
57	McCormick, Juani	B1, L1
58	McDuff, Kelly	L1
59	Meltzer, Alan	L1, J1
60	Moffett, II George M.	A3
61	NMFS/Andreas Mager, Jr.	C6, D6, L7, N1, N2/P7, N3/Q5, N4/C7,

		N5/Q6, N6
62	Olaisen, Keith	L1
63	Palm Beach County ERM, Richard Walesky	A12, C8, D2, D5, D7, D8, D9, D10, D11, D12, D13, E10, E11, F2, G1, G3, G4, G5, K3, K8, K9, L2, M5, M6, M7, M8, M9, O4, O5, O6, O7, P8, Q7
64	Panzer, Jim	L1
65	Rampage Dive Charter/Robert Johnson	B1, L1
66	Reuscher, Jeff	B1, L1
67	Rossi, Stella	A12
68	Sackel, Sol	A6, A8
69	Scalzo, Jim	L1
70	Schmidt, Kent	L1
71	Schwartz, Steve	F2, L1
72	Sheri	L1
73	Smith, Seckman & Reid, Inc.	B1, L1
74	Steinert, Ernst	L1
75	Swinson, Robert	C3, C6, F3, F4, P1, P4, Q5
76	Todd, Cynthia	L1
77	U.S. Dept. of the Interior, OEP&C, Terrence Martin	Deadline extension request
78	U.S. Dept. of the Interior, OEP&C, Gregory Hogue	D5, E8, E9, I1, J2, L6, M3, M4, P5, P6, Q2, Q3, Q4
79	Walker, R.	L1, L5
80	Weeks, Kim	L1
81	White, Roy	L1
82	Wiley, III, Earl T.	B1, F3, L1
83	Woodberry, Emily	A10, B1, E2
84	Woods Hole Group	A2, E1, E5, K10
85	Wooldridge, Chuck	J1 L1, L2
86	Zimms, John W.	J1, L1, F2, F3, F4

6.3 Comments and Responses

The following section includes the Applicant's responses to public comments on the DSEIS. The comments have been taken from the letters and emails received during the public comment period and the oral comments made at the September 12, 2002 DSEIS public meeting, as summarized by the USACE. The comments and responses are organized into 17 subject matter categories, designated A through Q, as listed below. Comments similar in intent or substance were grouped and summarized together. Each comment summary is followed by the Applicant's response, as reviewed and accepted by the USACE.

A – PROJECT PURPOSE & NEED

A1 Comment: The DSEIS does not include adequate information to establish the Project Purpose and Need.

Response: The purpose and need for the project is specifically addressed in Section 1.0 of the DSEIS. Section 1.2 lists four fundamental and legitimate purposes for the project. (See DSEIS, page 1). The Purpose & Need analysis in the FSEIS has also been expanded to address this concern.

A2 Comment: The Project Purpose and Need are clear and project should proceed as soon as possible.

Response: The Applicant accepts and concurs with this comment.

A3 Comment: The proposed beach nourishment project is needed to protect upland property, especially seawalls at Sun & Surf Condominium.

Response: The Applicant accepts and concurs with this comment

A4 Comment: The DSEIS studies and data are 20 to 30 years old and the DSEIS makes no mention of COF study.

Response: The DSEIS is based on data both current and historic data available to the Applicant, including site surveys and characterization of the beach placement and borrow areas conducted within in the last five years and aerial photography in 2001. The DSEIS is a supplement to the *Final Environmental Impact Statement for the Coast of Florida Erosion and Storm Effects Study - Region III (USACE, 1987).* This document is specifically referenced in Section 1.2 of the DSEIS and has been extensively discussed in Section 1.2 of the FSEIS.

A5 Comment: Phipps Ocean Park is a public beach and is unfit for use; the beach slope is dangerous and unsafe.

Response: The Applicant accepts and concurs with this comment.

A6 Comment: Tourism is essential to Florida and the State economy. A well-maintained and available public beach is essential to serve the visitors and promote tourism

Response: The Applicant accepts and concurs with this comment.

A7 Comment: The proposed Phipps Ocean Park Beach Restoration Project is necessary because we are in danger of losing sea turtle nesting areas.

Response: Though this is only one of four project purposes identified in the DSEIS, the Applicant accepts and concurs with this comment

A8 Comment: Restoration of Phipps Ocean Park Beach is essential to the health, welfare, and continued viability of the Town of Palm Beach.

Response: The Applicant accepts and concurs with this comment.

A9 Comment: The full project is not needed because only Sloan's Curve area (DNR Monument R-116 to R-117) is eroding. The No Action Alternative should be selected in the remainder of Project Area.

Response: The Applicant disagrees with this comment. (See response to Comment C1).

A10 Comment: The proposed beach nourishment project benefits do not outweigh the environmental and economic harm the project will cause.

Response: The Applicant disagrees with this comment. The restoration of the Phipps Ocean Park will result in positive economic and environmental benefits to the Town of Palm Beach, Palm Beach County, and the public. (See response to Comment E3).

A11 Comment: The beach nourishment project is not needed or justified because there is no public beach access. The Project Area is not a public beach.

Response: The Applicant disagrees with this comment. First, Phipps Ocean Park, the center point of the project, is a public park open to all visitors. Second, the degree of public access has been assessed by The Florida Department of Environmental Protection (FDEP) and is a specific criteria used by the State to determine the State contribution to the project.

A12 Comment: *Regarding Public Involvement (DSEIS Section 6.0)*, the County (of Palm Beach) has no record of being copied on the scoping letter.

Response: The Applicant, in coordination with the USACE-Palm Beach office, mailed copies of the scoping letter to local officials and agencies, including Palm Beach County, on August 31, 2001. In addition, a Notice of Intent (NOI) to prepare a Draft Supplemental Environmental Impact Statement (DSEIS) was published in the Federal Register on August 23, 2001.

B - SOCIAL & ECONOMIC ISSUES

B1 Comment: Divers from around the State come to Palm Beach County reefs, particularly Casino Reef, Horseshoe Reef and the Breakers Reef, and generate substantial economic activity in the local community. The proposed project will harm diving sites and the local tourism economy. The SEIS would be improved with some evaluation of the adverse effects on recreational interests (snorkeling area) and wildlife habitat (nearshore hardbottom areas) that would be lost if the Applicant's Preferred Alternative is selected.

Response: The Applicant recognizes the important economic benefit produced by visitors to the reefs offshore of Palm Beach County and has designed the Project to avoid impacts to the offshore reefs identified by the commenter. Figure 1.3 has been modified to show the location of Casino, Horseshoe, and Breakers Reefs relative to the Project fill and borrow areas. The three reefs of concern are located as follows: Casino Reef (approximately 3,600 feet north of Borrow Area III), Horseshoe Reef (approximately 1,800 feet east of Borrow Area III) and Breakers Reef (6.2 miles north of Borrow Area III). In addition, Section 4.15, Recreational Resources, has been expanded to more fully address this concern.

B2 Comment: Recreational and historic commercial fishing activity on reefs off of Palm Beach County contributed to the local economy. The proposed project will harm habitat and reduce fishing activity, harming the recreational fishery and the economy.

Response: The Applicant agrees that fishing activities contribute to the local and State economy. However, the Applicant's Preferred Alternative has been fully analyzed with respect to potential impacts on Essential Fish Habitat and adverse impacts on these resources are not expected. In addition, Section 4.15, Recreational Resources, has been expanded to

more fully address this concern. (See Appendix D, EFH Assessment Report).

B3 Comment: Financial support for the project from FDEP is not relevant to the decision before the Corps. Project cost should not be an issue.

Response: The Applicant accepts and concurs with this comment. While the level of State financial support for the Project is an important consideration for the Applicant, it has no bearing on the permitting issues now before the USACE and addressed in the DSEIS.

B4 Comment: The cost of the beach nourishment project and the eligibility of the project for State cost sharing is an issue. The Project Area is not a bona-fide critically eroded beach, nor is it eligible for 50% State cost sharing. The area between DNR Monuments R-121 and R-126 is subject to State beach access requirements. There can be no doubt that 55% of the Project Area is not truly qualified as critically eroded. The Town's request to extend the critically eroded area determination (9/19/99) cited "ineligibility of State funding," rather than the project continuity benefit. This raises questions about lobbying.

Response: The FDEP is the sole arbiter of the level of State support appropriate for the project and a final determination of the State cost share will be provided in the normal course of project consideration. The level of State support for the project is not a relevant federal consideration in the issuance of the §404/§10 permit requested by the Applicant.

B5 Comment: The proposed beach nourishment project primarily benefits property owners and they should bear the cost of the project, not the State or local government.

Response: The Applicant in conjunction with the FDEP and the local community appropriately determine the manner of project financing. This consideration is not essential to the USACE's consideration of the §404/§10 permit application under review in the DSEIS.

B6 Comment: No historic properties will be adversely affected by the project.

Response: The Applicant accepts and concurs with this comment.

C – CURRENT SHORELINE CONDITIONS

C1 Comment: The shoreline in the Project Area (DNR Monument R-116 to R-126) is not critically eroding. The statements in the Executive Summary (page iii) that the beach is critically eroding are deceptive and untrue. In truth, the FDEP has declared the beach critically eroding only down to DNR Monument R-121, a distance of some 4,700 feet out of 10,700 feet in the Project Area. The FDEP decision to extend the critically eroded area from DNR Monument R-121 to R-124 was only to improve the "continuity" of the project, but does not result in an extension of the area of influence of the inlet. The Corps should not approve any restoration between DNR Monuments R-121 and R-126, thereby sparing delicate environmental resources from certain harm due to the effects of unneeded restoration.

Response: The entire Project Area has been designated as critically eroding, consistent with the rules and policies of the FDEP as summarized in FDEP's report titled "*Critical Beach Erosion Areas in Florida*" (Report No. BCS-99-02 Bureau of Beaches and Coastal Systems April 2002) This report cites: "Extending south of Lake Worth Inlet along the Town of Palm Beach (R76-R128) are 10.9 miles of critical erosion threatening private

development, local parks, and State Road A1A. Most of this stretch of coast is armored with seawalls, bulkheads, and revetments. There are also numerous groins, a small beach nourishment project referred to as the Mid-Town project, and an inlet sand transfer project south of Lake Worth Inlet." A designation of "critical erosion" is not an essential consideration relative to the federal action under the FSEIS.

Restoration of the shoreline from DNR Monument R-121 to R-126 is essential to the Project. The elimination of fill in this area is unwarranted because without it, sand placed to the north would erode more quickly, become impounded by the existing headland features and still impact the nearshore environmental resources between DNR Monuments R-121 and R-126. The Appendix M analysis, while not directly applicable to the comment, is instructive how the existing shoreline will respond if fill is not placed in the area between DNR Monuments R-119 and R-126

Finally, Sections 1.2 and 2.1.1 of the FSEIS have been expanded to more fully address the need for the project, the historic conditions of this eroding shoreline, and to more fully evaluate the likely "performance" of the existing beach should the No Action Alternative be selected.

C2 Comment: Phipps Beach is stable or has accreted, especially since 1974.

Response: As discussed in Section 1.2 and Section 3.2.3 and identified in Table 3.11 of the FSEIS, beaches along the entirety of Palm Beach Island have eroded since 1974. Phipps Ocean Park is located in Reach 7, which lost, on average, over 45,000 cubic yards of sand per year in the period from 1974 to 1997, as identified in Table 3.9.

Section 1.2 has been expanded to more thoroughly address the condition and fluctuation of the existing shoreline.

C3 Comment: Current shoreline retreat in Project Area is caused by failure of Port of Palm Beach and Town of Palm Beach to maintain Lake Worth Inlet Sand Transfer Plant. Too many inlets have been cut and the inlets keep filling with sand that would otherwise migrate south to Phipps Ocean Park and to the Florida Keys.

Response: Palm Beach County has historically maintained the Lake Worth Inlet Sand Transfer Plant (STP). The Port of Palm Beach and the U.S. Army Corps of Engineers have historically maintained the inlet channel, turning basin, and jetties. As identified in Section 3.2.2 of the DSEIS, the plant was inoperable during the period from May 1990 to May 1996; this period corresponds to increased erosion on Palm Beach Island as identified in Table 3.11 of the DSEIS. Operation of the STP is not sufficient to offset inlet impacts upon Palm Beach Island. Sand is trapped within the inlet interior, ebb shoal and updrift beach as identified in Sections 3.2.2 and 3.2.3; the absence of mitigation of these impacts continues to result in erosion and shoreline retreat on Palm Beach Island. It is recognized that Palm Beach Inlet and other inlets trap sand that would otherwise migrate south of the inlets; elimination of these inlets is beyond the authority of the Applicant.

C4 Comment: The beach area has adequate rocky outcroppings and armoring to withstand up to a Category 2 hurricane.

Response: Yes, the rock outcroppings are likely to withstand a Category 2 hurricane without any significant impact to the rock. However, no evidence exists that the existing armoring would resist a Category 2 hurricane. In addition, as explained in Appendix N, damage to existing

structures is predicted if no action is taken in response to the current shoreline conditions. The existing rock outcrops are inadequate to provide upland storm protection.

C5 Comment: Because the shoreline is stable, sand placement is not needed to fulfill project purposes.

Response: Portions of the Project Area shoreline are now stable where the shoreline has receded to existing rock outcrops along the shoreline. Sand placement is still needed to achieve the Project purposes; a stable rock shoreline does not fulfill the Project purposes.

C6 Comment: The section of beach located between DNR Monuments R-116 and R-126 as shown in the DSEIS has never been nourished. Historical erosion data provided in the DSEIS show that the majority of the shoreline between DNR Monuments R-116 and R-126 has either accreted or remained stable since 1974. Only two areas near DNR Monument R-116 and R-117 have experienced significant erosion. (See also Comment N4). Based on this, the NMFS concurs with the determination by the USFWS, as provided in their May 5, 2000 report, that the placement of sand over the nearshore hardbottom in these locations could undermine the natural protection that these reefs provide. Based on our assessment of the proposed project (as stated in out letter of September 27, 2001), limited erosion occurring along small sections of the beach does not appear adequate to justify nourishment of the entire 1.9 miles of shoreline. Furthermore, the project does not address the blockage of littoral sand drift across Lake Worth Inlet, which is the apparent cause of the erosion at Phipps Ocean Park Beach.

Response: Table 3.6 of the DSEIS indicates that the Project Area shoreline, Reach 7, has vacillated, but has been predominantly stable since 1974; this stability is attributable to the rock outcrops that exist along the shoreline in the Project Area. As identified in Table 3.9, Reach 7 lost, on average, over 45,000 cubic yards of sand per year in the period from 1974 to 1997.

The placement of sand will not undermine the protection provided by the nearshore hardbottom along the Project Area; the hardbottom will remain intact and offer the same protective value, as limited as it is. As identified in Section 2.3.2, sand placement along the small portions of beach at Phipps Ocean Park would erode more quickly, impound upon existing headland features, still result in burial of hardbottom along the southern portion of the Project, and not meet Project purposes. The Project is justified to meet the Project purposes including a partial offset of the impacts of Palm Beach Inlet.

C7 Comment: NMFS EFH Conservation Recommendation #3. Prior to project implementation, the Applicant shall evaluate the feasibility of limiting nourishment to the immediate vicinity of DNR Monuments R-116 and R-117 where significant erosion has occurred. The results of this evaluation shall be provided to the Corps of Engineers for consideration and possible implementation. (See also Comment N4).

Response: Placement of fill solely in the vicinity of DNR Monuments R-116 and R-117 is not practicable and does not meet the Project purposes.

C8 Comment: *Shoreline & Volumetric Changes (DSEIS Section 3.2.3).* The beneficial impacts of the sand transfer plant are indicated by the significant volume loss throughout the study area, but especially in Reach 2, when the plant was inactive. The hypotheses on page 72 do not include an explanation of how they were reached or whether they include the established

periodic renourishment of Midtown, plant improvements and the expanded settling basin at the inlet. The summary is misleading in that it emphasizes present transfer activities rather than historic impacts. More emphasis should be placed on the loss of the beach system (dunes) to hardened structures and its subsequent inability to recover from periodic storm activities. Nourishment projects can not only replace the berm, but reestablish the dune. While inlet bypassing may stabilize the sediment budget, it will not replace the permanent loss of sand stored within the dune system.

Response: As identified on page 73 of the DSEIS, the hypothesis is based solely on activities "to … restore longshore transport on the island through improved sand transfer at Lake Worth Inlet." In general, hardened structures may impede or prevent sand movement from the dune to the active beach dune system. However, studies (Kraus, *Journal of Coastal Research*, Special Issue 4, 1988) indicate that hardened structures do not prevent beach recovery after storm events "if a sediment supply exists". Within the Project Area, the faces of most hardened structures are currently located landward of the existing beach and at or near the dune face and the sand retained by these hardened structures is insignificant in comparison to the historical background volumetric erosion. It is acknowledged that although 'inlet bypassing may stabilize the sediment budget, it will not replace the permanent loss of sand stored within the dune system." The Project, in combination with inlet bypassing, will partially offset the historical loss of sand from the beach-dune system and offset the impacts of existing hardened structures.

D – PROJECT ALTERNATIVES

D1 Comment: The Applicant should consider other alternatives to avoid and minimize the extent of fill.

Response: The comment asks that the Applicant consider "other alternatives" but fails to specify what those may be. In the 1996 COFS, to which the document is a supplement, the USACE identified and evaluated a full range of alternative responses to the shoreline erosion problems on Palm Beach Island, including Phipps Ocean Park. The alternatives considered in the COFS and the Phipps Project FSEIS are identified in Sections 2.1 and 2.3 of the FSEIS. In addition, a new Supplemental Alternative, T-Head Groins and Reduced Fill has been added to consider further reductions in hardbottom impacts. (See Appendix M).

All reasonable alternatives have been considered to avoid and minimize the extent of fill.

D2 Comment: T-Head groins should be installed. A permit application from one of the property owners at the north end of the Project Area has been submitted to the agencies. The Applicant plans to build two T-head groins. The impacts of those structures to the various alternatives should be addressed.

Response: The use of groins is evaluated as Alternative 2, Section 2.1.2, and in Appendix M, Supplemental Alternative, T-Head Groin and Reduced Fill. Based on additional modeling analysis completed in response to this and other similar comments, it is clear the use of T-head groins does not reduce Project impacts, does not meet the Applicant's project purposes, and is not cost effective.

With respect to the uncertain private initiatives under consideration, it is beyond the scope of this SEIS to address T-head groins as may be proposed by the property owners at the north

end of the Project. However, Appendix M does evaluate three potential T-Head Groin and Reduced Fill concepts that may be similar to the project under consideration by the property owners. The owners will have to address the impacts of their proposal.

D3 Comment: The No Action Alternative is justified. State funds should not be used to provide nourishment for private properties or those areas that are not designated as critically eroding.

Response: As identified in Section 2.1.1 of the FSEIS, the No Action Alternative does not fulfill the project purposes and is not justified. As identified in provisions of Chapter 161 of Florida Statutes, the Florida legislature has determined that State funds can be used for nourishment of private properties that are critically eroded, provided they meet other FDEP criteria for public access. Proposed State funding for the Project is consistent with these provisions.

D4 Comment: Beach nourishment and replacing sand on an eroding shoreline is a useless idea.

Response: Beach nourishment has been demonstrated to be an effective means of addressing beach erosion. Beach nourishment is the most common means of erosion control in Florida as funded by the State of Florida and U.S. Army Corps of Engineers. Erosion is, in essence, a lack of sand, which beach nourishment directly offsets with minimal detrimental impacts to the beach-dune littoral system on adjacent beaches. Direct benefits to public recreation and storm protection are projected for the Project.

D5 Comment: Genesis model runs were used to predict future conditions of the shoreline, however, the elements of the model were not presented in the DSEIS. The Applicant should provide a general description of the Genesis model, including the assumptions of the model and the parameters used.

Response: Appendix J has been added to the FSEIS; this appendix summarizes the Project "Preliminary Design" and provides a general description of the Genesis model, including the assumptions of the model and the parameters used. See D8 below.

D6 Comment: Although NOAA Fisheries (NMFS) believes that a long-term solution is needed for disruption of littoral sand drift caused by stabilization of Lake Worth Inlet; (NMFS) is not opposed to implementing temporary shoreline protection measures that would not result in significant environmental harm. However, we request that State and local governments, in consultation with the USACE Jacksonville District (USACE), undertake evaluation of a long-term plan to address sand transfer across the inlet and that efforts be examined to conserve, protect, and enhance reefs and other important habitats found in the area.

Response: The Town of Palm Beach, Applicant, has actively supported the formulation and implementation of a long-term plan. The Town developed the "*Lake Worth Inlet Management Plan*" (April 1995), which is the basis for the "*Lake Worth Inlet Management Study Implementation Plan Certificate of Adoption*" contained in Appendix I. This Plan has been adopted by the State of Florida. The Town has addressed "implementation actions" 3 and 5 to determine inlet effects and monitor the inlet; other actions require initiative by the USACE, Palm Beach County, and/or Port of Palm Beach. The Project has been designed to avoid, minimize, and mitigate impacts to reefs and other habitats in the Project Area.

D7 Comment: The DSEIS (pg. 2) states in part that, "The existing groins north of Phipps Ocean Park deter southerly longshore transport to the Project Area." Removing those groins would then appear to be an alternative that should be addressed.

Response: Removal of the groins north of Phipps Ocean Park is addressed in Section 2.3.14 and would eliminate some of the impediments to southerly longshore transport to the park. However, these groins are privately owned and beyond control of the Town and the USACE. In addition, if the groins were removed, existing seawalls and revetments also function as headland features that would deter longshore transport to the park. In light of the above, removal of groins is not a feasible alternative. This alternative has been added to Section 2.3 – "Alternatives Eliminated from Detailed Evaluation."

D8 Comment: The use of the No Action Model 1 is correctly dismissed in the text, as uniform hardbottom is known to exist underneath the sandy beach. Why it is included at all is unknown. Model 2 is also discounted in the text "(even though the natural rock may stabilize the shoreline)" because it also predicts shoreline loss. No description of how the models were calibrated, nor the eventual level of success of the verification run, is included in the report. The limitations of using the Genesis Model for this type of analysis should also be described if this model run is to remain part of the report. We suggest that the justification for dismissing the No Action alternative be based on an analysis of historical shoreline migration and beach volume loss rather than attempting to project some level of confidence in the results of a model run. Was the model used to estimate dispersion to the north over the first three years after the initial fill?

Response: Section 2.1.1, No Action Alternative, has been completely revised to eliminate any assumptions as to the presence or absence of nearshore hardbottom and rock outcrops. In November 2003, the Applicant completed a detailed jet probe and shoreline survey of the beach in the Project Area to identify rock features underneath the existing beach and update the location of the MHWL. This data was analyzed and the GENESIS models were re-run using actual, not assumed data, regarding the presence of hardbottom and rock outcrops. In addition, Section 2.1.1 and 3.2.3 were modified to include additional historical shoreline migration and beach volume loss data, rather than and provide a greater level of confidence in the results of a model runs.

See also D5 above, Appendix J has been added to the FSEIS and provides a general description of the Genesis model, including the assumptions of the model, the parameters used, the results from calibration and a discussion of the limitations of the model. Finally, as discussed in Section 2.1.1, the No Action Alternative is dismissed because the alternative fails to fulfill the Project purposes and the increased risk of structure damage (see Appendix N).

D9 Comment: Using structures to supplement beach fill projects has proven to be effective in many instances, and as such should not be dismissed as an alternative after reviewing one simple alignment of shore-perpendicular groins. Nor should the financial impacts of using structures be based on the assumption that adequate borrow areas are available nearby for renourishment carried projects. Sand resource studies out to date indicate that renourishment of this project will require the use of more distant borrow areas and the eventual use of a hopper dredge, which would have a significant impact on project costs. The effectiveness of structures for storm protection and their potential value as

replacement habitat should also be addressed. The 3.1 acres of mitigation reef required for the proposed project can be expected to cost well over $1.5 million. Nearshore structures may represent a method to provide some measure of "like-to-like" mitigation while providing shore protection.

Response: A complete analysis of three additional T-Head Alternatives, including additional modeling analysis has been added as new Appendix M in the FSEIS.

The Project is needed primarily due to insufficient sand in the longshore transport system as a result of interruptions caused by Lake Worth Inlet and the existing structures to the north of the Project Area. It is recognized that structures may increase the longevity of fill placed within the Project Area, however, that is not the case in the Phipps Project Area (see Appendix M). In addition, such structures are intended and can be expected to reduce sediment transport out of the Project Area resulting in translation of the longshore transport deficit and the corresponding erosion to the downdrift beaches to the south.

As cited in Appendix M of the FSEIS, the use of structures was dismissed because there was no demonstrable reduction in re-nourishment costs or volumes over the 50-year project life and the detrimental environmental impacts exceed the benefits. T-head groins are fully addressed in Appendix M.

Finally, the 1.5 million cubic yards placed for this project are not expected to be "gone" at the time of renourishment,8 years after initial construction. About 1,000,000 cubic yards of sand are expected to remain in the proposed fill area and about 500,000 cubic yards of sand are expected to be required for renourishment. The assessment of renourishment costs assumes use of Borrow Area IV. The borrow areas used for initial nourishment will not be depleted as a result of the proposed project; 1.5 million cubic yards of sand are proposed for the initial Project construction; the Borrow Areas III and IV are estimated to contain almost 2.5 million cubic yards of sand.

Note that if the Town of Palm Beach is successful in implementing the Town's proposed Coastal Management Plan, longshore transport would eventually be restored in the Project Area and the renourishment requirements for the Phipps Project would be significantly reduced.

D10 Comment: *Alternative 8 - Nearshore Berm (Section 2.3.5)*. Nearshore berms offer some advantages, which should be considered as part of the DSEIS. As stated, they "can help restore an eroding beach and provide a measure of storm protection...". They could then be utilized to satisfy the purpose and need for the project and actually provide a better quality beach for both recreational and habitat requirements. Sand transported from a berm to the beach by wave action is sorted along the way, which may alleviate some of the risks associated with the proposed borrow areas. The project could be maintained during the summer months, which could lower construction costs. A nearshore berm design should also be addressed in terms of an alternative disposal site for the expanded settling basin off the Lake Worth Inlet.

Response: As cited in Section 2.3.5 of the FSEIS, a nearshore berm is dismissed because it does not directly fulfill the Project purposes. In addition, for a nearshore berm to provide sand on the beach, sand must be transported over the nearshore hardbottom resulting in the same impacts as the Project. With the Project, sorting of placed sand will also occur by wave action. A nearshore berm associated with the proposed

expanded settling basin off the Lake Worth Inlet is beyond the Scope of this SEIS.

D11 Comment: *Alternative 11 (DSEIS Section 2.3.8).* We are unaware of any "annual bypassing goals" for the sand transfer plant beyond maintaining the updrift beach at its present location.

Response: Annual bypassing goals are identified in the "*Lake Worth Inlet Management Study Implementation Plan Certificate of Adoption*" contained in Appendix I.

D12 Comment: *Alternative 16 - (Section 2.3.13).* A feeder beach system is essentially what the county, local municipalities and the USACE have been working toward by nourishing beaches throughout the area and actively bypassing sand at the inlets. While the alternative is not a realistic one when addressing a single Project Area, the impacts of the larger program and the contribution this project could represent should be acknowledged.

Response: Such positive impacts are acknowledged. The Project will in part restore the littoral system and feed the beaches immediately south of the Project.

D13 Comment: *Lake Worth Inlet Sediment Budget (DSEIS Section 3.2.3).* Actually, the inlet was first opened in the early 1860's and the first jetties were installed in 1917. In addition to the plant improvements, the settling basin off the north jetty was expanded last year. As some 288,900 yards of sand is bypassed mechanically every year in order to maintain inlet depths and limit north beach extent, one would assume that the net annual longshore sediment transport estimate would exceed that figure, especially considering the sand accumulating in the shoals and what little is bypassed naturally. The summary on page 57 failed to include the sand dredged from the ebb shoal for the Midtown project with each renourishment, which would then indicate a budget surplus downdrift. If dredging the expanded settling basin is also included along with the improved capacity of the sand transfer plant since 1996, the estimates would not agree with any statements concerning the continued detrimental influence of the inlet (i.e. p.70-72)

Response: To demonstrate the historical impacts of Lake Worth Inlet and the need for nourishment on Palm Beach Island, the inlet sediment budget is presented in the FSEIS for two periods - 1974 to 1994 and 1994 to 2000; the later period reflects the use of the ebb shoal for the initial Midtown nourishment. The re-nourishment of the Midtown project made use of a borrow area about 1 mile south of Lake Worth Inlet – outside the inlet ebb shoal. Every year, the sediment budget changes in concert with weather and wave conditions, bypassing activities at the inlet, and other navigation and erosion control activities surrounding the inlet. It is unreasonable and unnecessary to continuously update the inlet sediment budget to address the Project. In fact, according to Palm Beach County's records, the Lake Worth Sand Transfer Plant bypassed a total of only 172,008 cubic yards of sand in 2002.

D14 Comment: The statement is made (page 43, Total Cost) that if the No Action Alternative were selected, net land losses would be $18 million. It would be helpful if there were some general explanation as to how this and other values in Table 2.2 were derived. The dry beach in question can only be maintained via indefinite renourishment, which is becoming increasingly costly, e.g. more than $14 million during the first 15 years of the project. While the excavated sand is effective in reducing the annual monetary losses from minor storm events (approximately $1.4 million), larger hurricanes

would continue to result in extensive property damage. This combination of circumstances makes it difficult to interpret how relative values are assigned unless all the underlying assumptions are detailed.

Response: The "Total Cost" values cited in Table 2.2 for the No Action Alternative are from Table 9-1 of the Town of Palm Beach "*Comprehensive Coastal Management Plan Update, Palm Beach, Island, Florida*" dated June, 1998. As cited in this Plan, the values are based upon erosion rates for the period 1990 to 1997 and "*land loss due to erosion, the cost of the land protected and the cost to build an erosion control structure or the costs of maintaining or repairing an existing erosion control structure in the absence of the Project.*"

E – APPLICANT'S PREFERRED ALTERNATIVE

E1 Comment: Various commenters support the Applicant's Preferred Alternative citing several reasons, specifically, that it will restore the incredible amount of beach area lost over the last decade, abate further erosion and loss of property, provide habitat for nesting sea turtles, have only short-term impacts on water quality, and has been peer-reviewed by several reputable scientists and experts and determined to be environmentally sound.

Response: The above comment is acknowledged and accepted as valid.

E2 Comment: Various commenters oppose the Applicant's Preferred Alternative citing several reasons, including beach nourishment is cosmetic, the fill material is not compatible with the native beach, it does not adequately compensate for loss of bypass material at Lake Worth Inlet, will result in placement of rock on the beach, and the borrow areas are too close to the Breaker's Reef.

Response: See response D4 regarding the comment "beach nourishment is cosmetic". See response G1 and G4 regarding the comment "the fill material is not compatible with the native beach". It is acknowledged that the Project "does not adequately compensate for loss of bypass material at Lake Worth Inlet"; the Project is intended to only partially compensate for the effects of Lake Worth Inlet. See response G1 regarding the comment "will result in placement of rock on the beach". The proposed borrow area is located more than six miles south of the "Breaker's Reef."

E3 Comment: The Applicant's Preferred Alternative is a temporary fix to a larger problem, does not provide protection against hurricanes, and is not cost-effective.

Response: Initial Project construction is acknowledged as a "temporary fix to a larger problem" associated with a regional sand deficit attributable to the effects of Lake Worth Inlet and other structures to the north of the Project Area; future re-nourishment is necessary to provide for maintenance of the Project. The Project is not designed to provide protection against all hurricanes; the Project is designed to resist a 15-year return interval storm event. The Project has been concluded to be cost effective; benefits (see Table 2.2) far exceed costs.

E4 Comment: The Applicant's Preferred Alternative is the best approach and has been proven effective in North Carolina and New Jersey.

Response: The above comment is acknowledged and accepted as valid.

E5 Comment: The Applicant's Preferred Alternative is designed to meet and will fulfill the project purpose and need.

Response: The above comment is acknowledged and accepted as valid.

E6 Comment: The Applicant's Preferred Alternative provides for mitigative actions as a consequence for unavoidable environmental impact to nearshore hard bottom substrate and its associated biotic community.

Response: The above comment is acknowledged and accepted as valid.

E7 Comment: Based on the information provided in the DSEIS, and (Marine Resources, Inc.) knowledge of both local marine habitats and renourishment operations, the proposed project, in our opinion, appears to be environmentally sound.

Response: The above comment is acknowledged and accepted as valid.

E8 Comment: The projected toe of fill for the Applicant's Preferred Alternative extends 280 to 500 feet offshore and will impact 3.1 acres of hardbottom. The Applicant should provide a detailed description of the method used to calculate the equilibrium toe of fill.

Response: Appendix J has been added to the SEIS; this appendix includes a characterization of the methods used to identify the equilibrium toe of fill. Specifically, the equilibrium toe of fill was identified as the seaward limits of fill following the occurrence of a 15-year return interval storm event.

E9 Comment: The Applicant's Preferred Alternative should be modified to include the creation of a dune at least 30 feet wide and with a slope of no less than 1V to 3H. The dune should be planted with native dune plants, including 90% Sea Oats and 10% mixture of seashore paspalum, seashore dropseed grass, seashore elder, railroad vine, and beach bean.

Response: The Applicant's preferred alternative does not include construction of a new dune in the Project Area because there is an existing dune in the Project Area. This determination is consistent with the USACE findings in the 1996 COFS and reflects a conclusion that the existing condition of the dunes does not warrant building any additional dune. The Applicant may add additional dune vegetation as necessary under separate permit post-construction.

E10 Comment: *DSEIS Section 4.4.3.* There is no time frame provided for the recovery of beach fauna other than "rapid".

Response: Monitoring of other beach nourishment projects indicates that fauna typically recover within two years of beach nourishment construction. According to studies cited in Section 4.4.3, recruitment and immigration of infaunal species can be reasonably expected within 1 year and no long-term impact to these resources is expected.

E11 Comment: In order to maintain consistency with other monitoring efforts throughout the State and county, Palm Beach County recommends that the construction of the project be completed before March 1 (or earlier) to allow for equilibration of the beach profile prior to the nesting season and to minimize interference with early season leatherback turtle nesting. (See DSEIS Appendix F, Part b).

Response: Restriction of construction after March 1 poses an undue and unnecessary burden upon the Applicant. Additional construction period is warranted to allow for (a) delays associated with weather conditions and high seas in the period from November 1 to March 1 and (b) variability in the availability of dredge equipment. The Project construction will be completed in accordance with provisions identified in the USF&WS Biological Opinion

and the Florida DEP permit which prescribes that "*Construction related activities are authorized to occur on the nesting beach (seaward of existing coastal armoring structures or the dune crest) during the early (March 1 through April 30) nesting season*" subject to specific conditions cited to avoid and minimize impacts to nesting sea turtles.

E13 Comment: *DSEIS, pg. iv, Major Findings and Conclusions.* The DSIES states that measures have been taken to avoid, minimize, and compensate for adverse impacts, including reducing the fill placement area to avoid nearshore hardbottom resources. Nonetheless, the SEIS Applicant's Preferred Alternative comprises the same amount of fill material and extent as was initially proposed in the Public Notice for the project dated March 22, 2000. In letters dated may 5, 2000 and June 1, 2000, EPA requested that the scope of the project be reduced, particularly south of DNR Monument R-121. Irrespective of anticipated sand spreading which occurs after all sand nourishment operations, this design change would have lessened nearshore hardbottom impacts in the vicinity of the adjacent golf course. After review of the SEIS, it is unclear what measures were examined to avoid and minimize adverse impacts to hard bottom resources. (See also Comment K2).

Response: The design presented in the application is the end product of the consideration of numerous other alternatives and selection of the most "appropriate" alternative, based on addressing the Project purpose, avoidance and minimization of environmental impacts, and identification of a project with a favorable benefit/cost ratio. The Town of Palm Beach consciously avoided extensive hardbottom resources that exist to the north of the Project Area (ATM, 1995). Comparably, during the development of the Project design, the Applicant considered a variety of beach fill designs, consistent with sound engineering practice and best professional judgment. The Applicant's preferred alternative, which is presented in the application, represents the most effective, optimized design of a beach nourishment project in this area in light of potential environmental consequences. The FSEIS includes a detailed analysis of both a smaller and larger beach fill design, including examination of these alternatives using established hydrodynamic modeling techniques.

Under NEPA's "hard-look-doctrine," the Applicant is required in the FSEIS to fully and fairly consider other designs that can fulfill the Applicant's project purpose and need. The Applicant has adequately fulfilled the obligation to examine other project alternatives, including the addition of a new T-Head Groin and reduced Fill Alternative (Appendix M). The Applicant's Preferred Alternative does utilize established and accepted techniques to avoid, minimize and mitigate undesirable natural resource impacts.

In addition, it is important to remember that the FSEIS for the Phipps Project Area is the third NEPA analysis of the Project Area since 1987. Since the 1987 project design prepared by the USACE and described in the Pal Beach Island GDM/EIS (USACE, 1987), considerable effort has been expended by the USACE, FDEP and the Applicant to refine the project design to avoid, minimize and mitigate for the environmental consequences of restoring the Phipps Beach. A review of the Federal record clearly reflects that the Phipps Project has evolved considerably since 1987 and that substantial measures recommended by USFWS, NMFS and others to address environmental consequences have been incorporated into the Applicant's Preferred Alternative. This evolution has resulted in avoidance, minimization, and compensation measures as describe below:

Avoidance Measures

1) The overall project length has been reduced compared to the USACE designs of 1987 (2.1 miles) and 1996 (3.25 miles).
2) The nearshore hardground impacts have been reduced from 5.4 acres (USACE Project, COFS, 1996) to 3.1 acres in the Applicant's Preferred Alternative.
3) By optimizing the design, the Applicant has extended the renourishment interval from 4 to 8 years, thus avoiding or reducing damage to offshore reef areas from temporary turbidity conditions associated with dredging.
4) The Applicant rejected alternatives that involved placement of fill north of R-116 because of the more extensive nearshore hardbottom resources in this area.
5) The proposed mitigation reef location has been selected and refined, using extensive jet probe coring, to avoid impacts to nearshore hardbottom north of the project.
6) Impacts to sea turtle nesting areas were avoided by limiting the fill placement window.

Minimization Measures

In response to specific comments from the Federal resource agencies over the last 20 years, the Applicant's Preferred Alternative and post-project monitoring program includes several features specifically intended to minimize the environmental consequences of the project. For example:

1) To minimize nearshore water quality impacts, a siltation dyke will be constructed at the discharge point and turbidity will be monitored in accordance with FDEP permit requirements. Turbidity in excess of 29 NTU above background will result in complete shut down of dredging operations until water quality standards can be met.
2) To minimize offshore borrow area impacts, the Applicant's Preferred Alternative specifically includes the following features and elements:
   a. Fill volumes were reduced by eliminating unnecessary or unwarranted project elements such as expanding the project north of R-116 or installing a dune and dune vegetation on a shoreline with adequate existing dunes.
   b. Use of buffers around natural hardbottom and reef features have been incorporated as recommend by the FDEP and federal resource agencies.
   c. Use of extensive sampling and monitoring before, during, and after construction to evaluate potential sedimentation impacts to offshore reef areas and provide for regulatory responses and project control.

Compensation Measures

The Applicant's Preferred Alternative includes the specific obligation to compensate for unavoidable environmental impacts to nearshore hardbottom resources. The mitigation plan has been approved by FDEP and is consistent with the USACE mitigation analysis in the COFS and FEIS. Construction of the nearshore mitigation reef will be undertaken at a cost of more than $1 million and be completed six months in advance of the beach fill project.

F – SAND SOURCE ALTERNATIVES

F1 Comment: The Applicant should take sand from somewhere else (unspecified) other than the proposed borrow areas.

Response: To identify potential sand sources for nourishment of beaches within the Town of Palm Beach, the Applicant investigated alternative borrow areas as identified in the

report titled "*Town of Palm Beach Offshore Sand Source Investigation*" (dated March 2000) by Coastal Planning & Engineering, Inc. The proposed borrow area is the only borrow area that can be used to nourish the Project Area by pipeline dredge and is the only economical borrow area for the Project.

F2 Comment: *Inlet By-Pass Sand Sources (Section 2.1.4.5).* The Applicant should consider Peanut Island as a sand source. Peanut Island is to be downloaded to the Lake Worth site. The construction contract is presently out to bid. The COE has expanded the settling basin just east of the north jetty. It is to be expanded further as part of the annual maintenance-dredging contract, thus providing additional material to downdrift beaches.

Response: Use of sand from Peanut Island or from maintenance dredging at Lake Worth Inlet is not economical for beach nourishment in the Project Area. This sand is expected to be placed on the beach immediately south of the inlet or perhaps on the beach in concert with the Midtown Project.

F3 Comment: To provide sand for the Project Area, the Applicant should consider upgrading and/or operating the Lake Worth Inlet Sand Transfer Plant. When dredging inlets, sand should be placed onto the beach south of the inlet being dredged. Continuous operation of the sand pumps should be considered.

Response: Palm Beach County currently operates the Lake Worth Inlet Sand Transfer Plant; the County and USACE are investigating means to improve sand bypassing at the inlet. However, optimum bypassing would be limited to restoration of long shore transport and would not offset the long-term historical impacts of the inlet. Such optimum bypassing is expected to include beach placement of sand dredged from the inlet and nearly continuous operation of the transfer plant pumps when sand is available to the plant's intake.

F4 Comment: The Applicant should study natural areas and work towards restoring nearshore sediment transport.

Response: The Applicant has studied the natural littoral system on Palm Beach Island. This system has been interrupted and deprived of sand by Lake Worth Inlet and existing structures to the north of the Project Area. The proposed Project is intended to restore the natural nearshore sediment transport within the Project Area and to the immediate south.

G – BORROW AREAS

G1 Comment: The proposed borrow area contains excessive rock or gravel. Utilizing the proposed borrow area as designed would, by the consultant's estimate, add over 100,000 cubic yards of "rock" on the beach. Use of the proposed material may require substantial remediation if layers of coarse material are indicated. The cost of such remediation may exceed the extra cost of using material from another borrow area. Sieving would be another alternative, but that process, too, is costly.

Response: Preliminary estimates of rock content were speculative and were conservatively based on visual characterization of rock content within the borrow area core logs. As a result of concerns expressed by Florida DEP staff, quantitative analysis of the borrow area cores and representative beach samples was performed as documented in the report titled "*Supplementary Geotechnical Analysis*" dated September 25, 2000 (see Appendix K). This analysis indicates that (a) the composite content of rock in the borrow areas is less than 0.2% which represents less than 3,000 cubic yards of rock or gravel, and (b) the borrow areas and native beach sediments

contain a comparable quantity or percent of rock or gravel.

G2 Comment: The proposed Borrow Areas are too close to the reefs.

Response: The above comment is not accepted as valid. The borrow areas are located a minimum of 400 feet landward of the existing reefs. Since (a) the Project is proposed to be constructed by hydraulic pipeline dredge, (b) the borrow areas contain a small fraction of fines – less than 2% overall, and (c) no anchoring is allowed within 200 feet of the reefs, turbidity is expected to be limited to the immediate area surrounding the dredge suction head and the Project is expected to have no effect upon the adjacent reefs. The "*Vessel Operations Plan*" in Appendix G identifies additional measures to ensure that there are no impacts to the reefs.

G3 Comment: The report includes estimated gravel percentages of cores taken by the county in 1993. Those cores were analyzed by weight, not volume and sieved at ½ phi intervals. We assume the estimates listed in the table were interpolated from the curves provided. The methodology also appears to utilize the entire core, regardless of the depth of cut. During the analysis of the offshore cores, all of the material greater than 5/8" diameter was removed "to avoid bias in the gradation analysis". In presenting the data for each strata, the relative volume of the "rock" is only estimated. Removing grossly coarser material from the sediment analysis provides more effective data for engineering calculations (i.e. overfill ratios, equilibrium estimates, erosion rates), but in situations where the percentages of "rock" are estimated to be as high as 50% in some strata, that argument is certainly questionable. Assessment of potential impacts to sea turtle nesting and the negative publicity associated with substandard material must include specific information on rock and shell content. Describing and weighing the material removed from the largest sieve and utilizing a series of even larger sieves when necessary would help to provide the required data.

Response: Material larger than 5/8" was removed from the half of each core used for sampling "to avoid bias in the gradation analysis" as identified in the report titled "*Town of Palm Beach Offshore Sand Source Investigation*" (dated March 2000) by Coastal Planning & Engineering, Inc. The undisturbed half was used for determination of the content of coarse gravel and rock in excess of 5/8" as documented in the report titled "*Supplementary Geotechnical Analysis*" (dated September 25, 2000) by Coastal Tech. The borrow area has been determined to contain less than 0.2% coarse gravel and rock by volume; this is estimated to correspond to less than 0.3% coarse gravel and rock by weight.

G4 Comment: It is the opinion of Palm Beach County staff that the information provided is not sufficient to accurately forecast the quality of sand that will eventually end up on the beach. Large pockets or lenses of shell or rock remain a possibility and would have to be isolated, removed and replaced with clean fill as the dredging progressed. Summary statistics for the sediment characterization (including sample size and standard errors of the mean) are needed to more accurately portray the borrow area and native beach materials.

Response: The above comment is not accepted as valid. The Florida DEP has approved the borrow areas as a sand source for the Project. The report titled "*Town of Palm Beach Offshore Sand Source Investigation*" (dated March 2000) by Coastal Planning & Engineering, Inc and the report titled "*Supplementary Geotechnical Analysis*" (dated September 25, 2000) by Coastal Tech provide the summary statistics of

the material within the borrow areas. Excerpts from these reports are included in Appendix K.

G5 Comment: *Sand Quality, DSEIS Section 3.1.2*. The use of generalized historic data to represent the characteristics of the native beach is not justified in light of more specific data. To characterize the beach as more "stressed" in 1999 goes against the information presented earlier in the text that indicated a long-term erosional trend. The county's 1993 Environmental Assessment of the Project Area indicated that the "native" beach sand could be characterized as: 0.42 mm mean grain size, 0.57 sorting .0006% silt, 48% Carbonate, and 312 CPU average compaction.

As stated above, the borrow material appears to contain a much larger fraction of coarse material than the native beach. The potential impacts of such material, in terms of project performance, recreational value and habitat degradation should be addressed. The text does not describe which "native" sediment characteristics were used to calculate the overfill factor. Certainly the use of any other data but the most recent would not represent a reasonable calculation. Again, summary statistics for the sediment characterization (including sample size and standard errors of the mean) are needed to more accurately portray these materials. The native beach sediments should include analysis of samples from the dry beach only if they are to be used in analysis of potential turtle nesting habitat.

Response: In response to this comment, Section 4.3.3 has been revised and Appendix K added to provide additional data and analysis regarding the compatibility of the borrow area and native beach sediments. The use of historical data "to represent the characteristics of the native beach" is entirely justified and consistent with the long-term erosion trend whereas the existing beach sediments have been worked by wave action and fines have been washed and winnowed from the beach.

As identified in the report titled "*Supplementary Geotechnical Analysis*" (dated September 25, 2000) by Coastal Tech (see Appendix K), the borrow material contains a comparable fraction of coarse gravel and cobble as the native beach. This coarse fraction in the borrow material will perform comparably to the coarse fraction on the native beach. The historic native sediment characteristics were used to calculate the overfill factor. The existing native beach sediments have been analyzed relative to content of coarse gravel and cobble to address concerns relative to potential turtle nesting habitat and recreational use of the nourished beach.

G6 Comment: While seven potential borrow sites are mentioned in the text and depicted in Figure 2.6, it would be helpful if a summary of the pertinent information in Coastal Tech 2000d were provided in the final document to verify that Sites III and IV can meet the sediment needs of the project at the least environmental cost.

Response: The "*Supplementary Geotechnical Analysis*" (dated September 25, 2000) by Coastal Tech has been included as Appendix K.

H – OVERFILL RATIO

H1 Comment: There is the cavalier and deceptive application and computation of the Overfill Factor (OF) concept, which is applied in estimating how much extra and total fill will be needed, due to inferior sand quality, in order to accomplish the intended beach design profile. In this case, the calculated amount of required overfill, if properly done, would be truly enormous and would cause catastrophic damage to existing environmental assets.

Response: The above comment is not accepted as valid. The overfill factor is the basis of determining the desired quantity of fill. The project performance and environmental impacts are modeled and predicted on the basis of actual grain size characteristics of the borrow area and actual proposed fill quantities.

H2 Comment: The Lilja report on the overfill factor is based in part on work by specialists at the Palm Beach County DERM. Lilja concluded, "There is not sufficient, nor quality fill sources to satisfy even initial restoration, and no fill for subsequent mandated renourishment, not for unforeseen needs. The project is not technically feasible as presented and would cause disastrous damage to the environment."

Response: The borrow areas proposed for the initial Project construction contain almost 2.5 million cubic yards of sand; only 1.5 million cubic yards are proposed in conjunction with the initial Project construction. Borrow Areas III and IV are projected to contain almost 2.4 million cubic yards of sand. These borrow areas are sufficient for initial Project construction and for, at least, the first re-nourishment project. Subsequent nourishment will require use of other borrow areas identified by the Applicant.

H3 Comment: The facts are that the OF now is 1.75 for 1/4 of the project and OF for the remaining 3/4 is now 4,0 (sic), while the project comes up 40% short of the 800,000 cuyds (sic) "discounted" design profile volume. This tells us, that the project is not-doable, cannot be predicted, is senseless and irresponsible and would not produce any envisioned profile, but would do enormous and unpredictable amount of damage to the environment. (Lilja Report).

Response: The above comment is not accepted as valid. As cited in Appendix J, the overfill factor is identified as 1.2 for Borrow Area III, and 3.4 for Borrow Area IV. The composite overfill factor is 1.9 for the Project. These parameters reflect the relationship of the borrow material to the native material but are not used in the modeling and prediction of Project performance. The Project is specifically modeled and designed based on use of the more fine material from Borrow Area IV; use of Borrow Area III would result in improved performance due to the larger mean grain size in this borrow area. The predicted Project performance is considered to adequately meet the Project purposes by providing an enhanced beach throughout the Project Area for most of the Project life. If the Project fill were moderately increased or decreased, no change in the predicted environmental impact would be expected due to the proximity of the hardbottom to the existing shoreline in the Project Area.

H4 Comment: As to the Applicant's brief reference to the Overfill Factor, in just 4 short lines on page 74 of the DSEIS, I (S. Lilja) shall make the following observations: Frankly, the Applicant's handling of the subject is so convoluted, distorted and illogical, as to be impossible to respond to factually, so I shall try instead to apply common sense; By some mysterious computation, and through some "back door" entrance, based on assumption upon assumption, the Applicant arrives at what must be understood as some average Overfill Factor of 1.9, as the result of its electing to deposit (only) 1.5 mcyds, which the Applicant, without further calculation of analysis, says would yield 800,000 cyds of "design fill." That conclusion and those design volumes emanate from pages 7 and 8 of Coastal Tech's 1/27/00 "Recommended Preliminary Design." Please read those pages, as they appear rather spectacular in its reasoning and approach. When we examine Table 3.12 (DSEIS, page 73) and page 7 (preliminary Design Report), we find that the Applicant has managed to reduce the true .43m/m grain size for the native beach

sand, via .395 and down to .34 m/m, which of course would highly affect and distort any computation of the Overfill Factor. It is vitally important that this project not be built upon loose sand, so to speak. While calculation of the Overfill Factor is not an exact science, it is the simplest and most important tool available. Let's not make a mockery of it.

Response: The above comment is not accepted as valid. (See responses to Comments G5 and H2 above).

H5 Comment: What is also spectacular, is the apparent belief that an AVERAGE Overfill Factor can be arrived and used for two different mean grain size lots of fill (1.75 and 4.0 resp). Just like socks, one size fits all? Please try to imagine what would happen, when the dredger runs out of the 1.75 OF sand and must switch to the 4.0 variety, as he moves up (or down) the length of the beach and, abruptly must apply 2.3 time MORE sand, per linear foot of beach, which of course would result in a drastic change in the shoreline. Could you envision a new plateau reaching further out in the Ocean? That would be Before Mother nature washes it away and ruins those environmental assets, which have not yet been buried, during the initial pumping. This must come close to definition (sic) of mind-boggling.

Response: The above comment is not accepted as valid. The Project is conservatively designed based on use of the material available in Borrow Area IV. (See responses to Comments G5 and H2 above).

H6 Comment: In Table 3.12 (DSEIS page 73), there is a foot note (which applies to the proposed borrow sites only) which reads "gravel, course gravel & cobble were excluded in Borrow Area samples for grain size analysis." This will distort comparison with other grain size values.

Response: Section 4.3.3 has been modified to better explain the FDEP variance issued to the Applicant following release of the DSEIS**.** In addition, the exclusion of "gravel, coarse gravel and cobble" from gradation analysis is an historic practice associated with gradation analysis for characterization of native and borrow area sediments for beach nourishment. This practice results in:

(a) Characterization of sediment mean grain size as more fine than if gravel, coarse gravel and cobble were not excluded, and
(b) A conservative projection of fill performance.

As identified in the Appendix K, the borrow material contains a comparable fraction of gravel, coarse gravel and cobble as the native beach. (See response to Comment G5 above).

I - PHYSICAL PROJECT MONITORING

I1 Comment: During construction of the beach fill, the dredge pipeline should be inspected frequently to prevent accidental leakage of sand.

Response: The above comment is acknowledged and accepted as valid. The Contractor is responsible to ensure that his pipeline does not leak. The Contractor is motivated to prevent leaks whereas the Contractor does not receive payment for any sand leaked from the pipeline outside the fill template and the Contractor is responsible for mitigation of the impacts of any leaks.

J – VESSEL OPERATIONS

J1 Comment: Do not dredge sand near the offshore reefs. The 400-foot buffer is inadequate to protect the fragile reefs in the vicinity of the project borrow areas.

Response: The above comment is not accepted as valid. (See also Response to Comment G2 above).

J2 Comment: The pipeline corridors for the project are not depicted in the plan for the Applicant's Preferred Alternative. The corridors should be shown and located outside of hardbottom areas.

Response: No hardbottom areas exist between the borrow areas and the fill area. Comparably, no corridors exist.

K - NEARSHORE HARDGROUND RESOURCES & IMPACTS

K1 Comment: Hardbottom reef impacts are not adequately addressed.

Response: Impacts are thoroughly discussed in sections 4.7, 4.8 and 4.20, as well as in Appendix C and Appendix D. It should be noted that nearshore hardbottom was mapped from inlet to inlet, baseline surveys were conducted in the study area to characterize the biological setting and that impacts are evaluated for each proposed alternative. In addition, additional filed data was collected in November 2003 to document the presence of rock outcrops and hardbottom under the existing beach, as described in Sections 2.1.1 and 3.2.4. More specific analysis on EFH listed species is found in Appendix D. The analysis provided is more than what is typically submitted in a NEPA document for beach restoration activities.

K2 Comment: *Page iv, 6 Major Findings and Conclusions.* Nearshore hardground will be buried by the project and the impact should be avoided. The SIES states that measures have been taken to avoid, minimize, and compensate for adverse impacts, including reducing the fill placement area to avoid nearshore hardbottom resources. Nonetheless, the Applicant's Preferred Alternative comprises the same amount of fill material and extent as was initially proposed in the Public Notice for the project dated March 22, 2000. In letters dated May 5, 2000 and June 1, 2000, EPA requested that the scope of the project be reduced, particularly south of DNR Monument R-121. Irrespective of anticipated sand spreading which occurs after all sand nourishment operations, this design change would have lessened nearshore hardbottom impacts in the vicinity of the adjacent golf course. After review of the DSEIS, it is unclear what measures were examined to avoid and minimize adverse impacts to hard bottom resources. (See also Comment E13).

Response: Efforts to minimize impacts to hardbottom resources were thoroughly evaluated through the plan formulation process, whereby over 17 alternative concepts were investigated as means of achieving the Applicant's purpose and need. Alternatives to avoid and minimize impacts were initially evaluated in the Town of Palm Beach Comprehensive Beach Plan Update in 1998, with the goal of avoiding nearshore rock impacts north of the present project. Numerous alternatives were considered for this project. Accomplishing the purpose of the project (storm protection), minimizing environmental impacts, and cost effectiveness were equally weighed in this process. The Applicant's Preferred Alternative best addresses these three concerns. Restricting the size of the project further would result in a project that would not meet the project purpose, or be cost effective.

K3 Comment: Nearshore hardground impacts are not avoidable. In DSEIS Section 4.21.1, irreversible commitments should include the lost hardbottom, as maintaining the project will keep them buried. Mitigation provides a resource, but does not change the commitment. In DSEIS Section 4.22, the unavoidable adverse

environmental effects should include loss of hardbottom and impacts on turtle nesting.

Response: The Applicant concurs with the above recommendations.

K4 Comment: Nearshore hardground substrate is common in the Project Area and not unique.

Response: The Applicant concurs that the nearshore habitat is common in southeast Florida, however, it is considered unique based on its listing and consideration as Essential Fish Habitat (see Appendix C).

K5 Comment: Nearshore Hardground is not a "coral reef" but rock of the Anastasia Formation.

Response: The Applicant concurs with this comment and have made the necessary changes in the text.

K6 Comment: Under conditions existing prior to construction of the Lake Worth inlet, surficial exposure of Anastasia rock in the form of nearshore hard bottom was ephemeral, fluctuating between being exposed and covered by a shifting sand veneer.

Response: The surficial exposure of nearshore hard bottom is still ephemeral as described within the Cumulative Impact Assessment in Appendix C. While construction of the inlet has resulted in significant erosion modifications to the beach profile downdrift of the inlet it has also greatly increased the amount of rock exposure immediately south of Lake Worth. Much if not all of the nearshore habitat in the study area is ephemeral, is never in a steady state condition and is constantly altered in ecological value due to the high frequency of natural disturbances indicative of this intertidal nearshore zone.

K7 Comment: The hardbottom characteristics of the nearshore Project Area are located intertidally to a water depth of approximately 3 m (10 feet). This nearshore area is a physically stressed environment characterized by variable wave action, sediment transport, temperature, and water clarity. The biological community supported by the nearshore hardbottom is typically characterized as opportunistic and is dominated by low profile, encrusting, and boring organisms. Most of the biological components are fast growing (often seasonal) and are initial and/or early recruitments in successional hard bottom community development. The continuing presence of these predominant opportunistic species within the rather dynamic high-energy nearshore environment is a result of continuously changing patterns of competition, predation, and physical disturbances (e.g., wave action, scouring, turbidity, and temperature fluctuation). The high frequency of physical disturbances promotes biological turnover, varies recruitment, and subsequently impedes development of a perennial epibiotal community characteristics of hard bottom located in deeper water, offshore of Palm Beach.

Response: The Applicant concurs with the above statement.

K8 Comment: *Hardbottom Resources (DSEIS Section 3.7).* While the biological significance of the hardbottom areas is debated, the quality of habitat relative to other areas within the county should be reported.

Response: The majority of hardbottom within the Project Area is located on the beach or at intertidal and shallow subtidal elevations and is defined as a Nearshore Habitat in Section 3.7 and Table 3.13. Unlike most beaches in southeast Florida where this hardbottom feature occurs, the hardbottom off Phipps is located in

or above the surf zone, such that any modification to the Toe of Fill (TOF) of the project would not reduce impacts to the habitat. Elsewhere on Palm Beach, such as Midtown, or in Juno or Ocean Ridge the hardbottom features generally occur further seaward, with most of the impacts occurring in deeper subtidal zones. Therefore, it is quite apparent that the quality of habitat that may be impacted is of less value than at many other locations within the county.

K9 Comment: *DSEIS Section 6.1.1, Figure 2 and Appendix C.* The multi-spectral image analysis of hardbottom resources from the Project Area includes schools of fish and areas that are likely drift algae. The analysis should be reviewed and confirmed by an experienced analyst.

Response: It should be recognized that the image analysis was conducted using the best available aerial photography. However, a limited budget was available and the older, sub-standard aerial photographs were analyzed without extensive ground-truthing. We recognize that some of the mapped signatures may indeed be other features than defined, however, the degree of resolution with the available aerials used prevented a more detailed interpretation. In addition, due to budget considerations the mapping south of the Phipps project location did not include any ground-truthing, but relied upon signature ground-truthing within the Phipps Project Area. We are unaware of any better available historical photography of the Project Area that could have improved the analysis.

K10 Comment: We (Woods Hole Group) concur with the Draft SEIS that the primary potential environmental impacts are associated with disruption of the benthic communities at the borrow site and beach replenishment areas, as well as disruption of the nearshore hardbottom resources resulting from offshore dredging, on-shore disposal of dredged material, and related water column turbidity. Dredging and disposal impacts are both short-term construction related and long-term, whereas water quality impacts are only short-term. These types of potential impacts are associated with any beach replenishment project; therefore, the challenge is to minimize impacts to the extent practicable, and then to monitor and mitigate unavoidable impacts. We believe impacts have been minimized and an appropriate monitoring and mitigation plan has been proposed. We also commend the Applicant for the extensive environmental commitments associated with this project that are listed in Section 4.27. Our overall recommendation, based on our knowledge of the Palm Beaches and review of the draft SEIS, is to proceed with the Phipps Ocean Park Beach Restoration Project. We believe the environmental impacts have been minimized and that appropriate monitoring and mitigation measures have been proposed.

Response: The Applicant concurs with these conclusions concerning the proposed project**.**

L – OFFSHORE HARDGROUND RESOURCES & IMPACTS

L1 Comment: The possible impact of the project to offshore hardground/reefs is a concern and the reefs should be protected, especially Horseshoe and Casino reefs.

Response: The Applicant agrees that adverse impacts to the offshore hardbottom features must be avoided and the FDEP permit for the project includes substantial safeguards to accomplish this objective. No offshore reefs will be adversely impacted from the proposed project. Figure 1.3 has been modified to show the location of Casino, Horseshoe, and Breakers reefs relative to the Project fill and borrow areas. The three reefs of concern are located as

follows: Casino Reef (approximately 3,600 feet north of Borrow Area III), Horseshoe Reef (approximately 1,800 feet east of Borrow Area III), and Breakers Reef (approximately 6.2 miles north of Borrow Area III).

Protection of the offshore reefs in the vicinity of the borrow areas is provided primarily by the 400 foot "no-dredge buffer" between the borrow area and the hardground features, extensive turbidity monitoring is required every six hours during the dredging operation and will include sample time, water depth, sample depth, weather conditions, tidal stage and direction of flow, wind direction and velocity, and wave height. In addition, other vessel control requirements and biological monitoring requirements, as established in the FDEP permit and included herein as Appendix F, are fully adequate to prevent impacts to the offshore hardbottom. (See also response to G2).

L2 Comment: Turbidity and silting (during dredging) will damage offshore reefs and organisms. Persistent increased turbidity following construction is not discussed.

Response: The potential impact of turbidity in the vicinity of the borrow area and placement areas is recognized and fully addressed in the project plan, specifically Appendix F, Physical and Biological Monitoring Program. Appropriate best management measures are required to keep turbidity within State mandated limits and avoid impacts to offshore reef organisms. Any elevated turbidity that may occur will be short term in nature during the project, including both dredge and fill activities. Sediment analysis of the borrow areas indicates no significant silt in the material making the potential for persistent sedimentation of offshore hardground features insignificant. Nonetheless, during the dredging operation, turbidity monitoring will be provided every six hours at the surface and 1 meter above the bottom. If monitoring reveals turbidity levels greater than 29 Nephelometric Turbidity Units (NTUs) above associated background levels, construction activities must cease immediately. Diver surveys of the benthic community on hardground features in the vicinity of the borrow areas are also required and any adverse impacts must be reported to the FDEP immediately. Monitoring of the offshore reefs during construction, vessel controls, and the 400-foot "no-dredge buffer" will serve to insure protection of the reefs. (See also responses to L1 and G2).

L3 Comment: Carried by the Gulfstream current, turbidity and /siltation of offshore reefs will damage commercial fishing and lobstering.

Response: See response to above comment. Commercial fishing and lobstering will not be impacted by the proposed project. It is noteworthy that the monitoring of turbidity during dredging must also include tidal stage and direction, wind direction and velocity, and wave height. These parameters will allow the Applicant to fully evaluate potential turbidity impacts under all current conditions. (See also response to L1 and G2 regarding turbidity impacts).

L4 Comment: Breakers Reef is an important resource and the commenter objects to any project that would damage this reef.

Response: The Applicant concurs that the Breakers Reef is an important recreational dive spot and will ensure that no damage to this area will occur from the project. (See also responses L1, L3 and G2).

L5 Comment: I understand the Corps plans on dredging along the Palm Beach reef to place sand on the beaches. This may be good for the beaches, but not the reefs. I hope all divers convey their concern and vote NO!

Response: The offshore reefs will not be impacted by the project. The only habitat that will be impacted lies on or near the beach in less than 3m of water. This nearshore habitat is not the same as the offshore reefs and is dominated by species tolerable of the constantly changing physical conditions and as such is not as ecologically important as the offshore reefs. (See sections 4.7, 4.8, 4.20 and Appendix C and D).

L6 Comment: The Department of Interior believes the Applicant should provide mitigation for any permanent damage to hardbottom reefs adjacent to the borrow area due to sedimentation.

Response: The Applicant concurs and are required by the FDEP permit to compensate for impacts to hardbottom reefs adjacent to the borrow area. However, best management practices as identified in the project plan and Appendix F are adequate to ensure avoidance of impacts to the offshore reefs. First, based on the borrow area footprint, at least a 400 foot buffer will be present between the reefs and borrow area dredging limit. Second, following construction of the project, the FDEP permit requires monitoring of the mitigation reef for a period of three years (See Appendix F). If the three-year monitoring survey indicates a reduction in the extent of the artificial reef, the Town must submit a plan to make up the difference and implement the plan once approved by FDEP. Finally, the post-project monitoring reports submitted to FDEP must also "identify erosion and accretion patterns within the project limits, and along adjacent shorelines, verify the analyses that were conducted in the development of the project, and identify any adverse impacts." (Appendix F, 4(b) emphasis added, and see also responses to comments L1, L3 and G2).

L7 Comment: The DSEIS acknowledges that the direct and secondary effects of turbidity and sedimentation to coral reefs and local fisheries are possible. Although the project plans call for utilization of best management practices in order to minimize sedimentation and turbidity, the potential for significant adverse impacts exists and additional mitigation may be needed to compensate for these impacts. In the absence of mitigation plan that addresses reasonably anticipated impacts, additional impact monitoring, as needed to detect damage caused by turbidity and sedimentation, is needed, (See also, Comment R3 and R4).

Response: The Applicant acknowledges the potential for secondary impacts associated with the effects of turbidity and sedimentation. However, such impacts are not expected. To verify that the Project will not have an adverse affect on the natural nearshore hardbottom outside the fill area, the FDEP permit requires monitoring of the hardbottom located approximately within 1,000 feet to the north of the Project via underwater surveys with video documentation "immediately prior to construction, immediately after construction, and annually thereafter for a period of three years". The FDEP permit also requires "visual assessment of the condition and status of the benthic hardbottom community adjacent to the borrow area … at least once a week during periods of active dredging." This monitoring is expected to verify the absence of any secondary and cumulative impacts.

L8 Comment: The DSEIS states (page 101) that secondary impacts (elevation of suspended solids) could occur downdrift of the Project Area as "fines" winnow from the material placed at the beach. These secondary effects would reduce algal production (reductions in light levels) and could interfere with the ability of coral to feed heterotrophically. In composite, this would diminish biological function/

diversity. Since all borrow material contains some percentage of fines, this is an unavoidable impact. The SEIS should provide, at least, a quantified range of significance for these secondary impacts and propose appropriate mitigation for them.

Response: The GENESIS model ran for the project forecasts movement of sand to the north of the fill template with 0.13 acres of nearshore hardbottom impacted, which is included in the total 3.1-acre impact for the project. It is not anticipated that any long-term reduction in algal production will occur as a result of the short-term increases in turbidity from the project. Section 4 addresses these impacts, as well as the cumulative impact assessment in Appendix C. Buffers between the borrow area limits and offshore reefs will help insure that no impacts occur to these resources and monitoring will be employed to document any potential impacts. As no impacts are anticipated, establishing a level or range of significance is not needed.

L9 Comment: EPA requested that the SEIS provide information on the impacts to macro-invertebrate communities residing in the proposed borrow areas. Instead, the Applicant conducted a video survey (Appendix H) of the borrow area which provides a qualitative overview of the various biological assemblages. This macro-characterization is instructive, but it does not provide the necessary information to determine whether any additional mitigation would be necessary to compensate for the dredging which will occur in sites III and IV.

Response: Impacts to infaunal communities in the borrow areas are discussed in section 4.0 of the DSEIS. The conclusion reached from a review of existing literature is that the benthic community will recover rapidly, generally within a year or two. It should further be noted that the FDEP has not required infaunal monitoring for beach projects since the early 1990's due to the wealth of studies supporting rapid recovery. No mitigation has been proposed or required for infaunal community impacts.

M – CUMULATIVE IMPACTS

M1 Comment: The DSEIS fails to acknowledge or address cumulative impacts.

Response: See Appendix C, Cumulative Impact Assessment, for a comprehensive analysis.

M2 Comment: The DSEIS exclusively addresses the Phipps Ocean Park Project Area and fails to consider projects from Boynton Beach Inlet to Lake Worth Inlet.

Response: During the agency scoping meetings held prior to preparation of the DSEIS the consensus of all attending agencies was that the geographic area identified for the assessment from Lake Worth Inlet to South Lake Worth Inlet was satisfactory. The Cumulative Impact Assessment in Appendix C provides a thorough analysis.

M3 Comment: The DSEIS Cumulative Impact Assessment considered the proposed project and all other past, present, and future actions that could potentially impact nearshore hardbotttom in the Project Area. The assessment concludes that the cumulative effects should be considered adverse, but not significant because adjacent hardbottom is clearly not limited. The Department of the Interior believes that hardbottom in the Project Area may be limited. Data presented in the assessment suggests that hardbottom habitat within the Project Area has significantly declined in recent years, by 30 acres from 1985 to 2000 (see Table 5, page 23, Appendix C).

Response: While we do concur that the resource is limited in distribution to southeast

Florida, we do not believe the impacts proposed are significant. It should be noted that this decline was calculated by averaging trends observed at all reaches between inlets and for three aerial dates (i.e. 1985, 1993 and 2000). A comparison of 1985 and 1993 coverage actually showed an increase by 13.1 acres and a reduction of 43.1 acres when comparing data from 1993 and 2000. Since the landward limit of hardbottom was calculated as the distance between the monuments and hardbottom exposure, changes in hardbottom exposure generally correspond to the beach width, which varies from reach to reach (Table 5 and 6) depending upon the dynamics of sediment processes and history of sand placement on the beaches to the north and due to the frequency of sand transfer south of Lake Worth Inlet. In addition, much of the loss of hardbottom between 1993 and 2000 was rock substrate present in or above the intertidal zone, which is less ecologically valuable than subtidal rock habitat further seaward. As discussed in section 3 and 4 this hardbottom habitat is not unique to Palm Beach and is considered very ephemeral in nature. It is expected that had aerials been available and analyzed annually from 1985 through 2000 that the overall trend observed may not have been as clear cut and definable as seen with only three data sets. It is our professional opinion that when there is a lack of sand within the littoral system more hardbottom is exposed due to wave action than would occur when an abundance of sand is in transport, constantly feeding downdrift beaches as it moves south. For information on sand placement, shoreline and volumetric changes, and sediment budget on downdrift beaches, see Section 3.2.3 and Table 3.10. While the nearshore sediment dynamics are not fully understood, the loss of hardbottom from 1993 to 2000 may be in part due to increased sand bypassing, resulting in natural episodic covering.

M4 Comment: Several beach nourishment projects are proposed in the project vicinity (see Table 1, page 11, Appendix C). These projects, as well as future renourishment projects, will continue to impact hardbottom ecosystems in the region by introducing fine sediments into the nearshore environment. The Department of the Interior notes that the cumulative impacts to nearshore habitats including elevated sedimentation and turbidity are not well understood. Based on data provided, we believe the cumulative impacts of the beach nourishment projects to marine resources may be significant and we recommend the Applicant provide a mitigation ratio of 2:1.

Response: The analysis concluded does not support these suggestions. As the beach fill template is very small, the directly impacted resource is minimal in size and secondary impacts are not anticipated to exceed 0.13 acres, based on modeling results. The conclusion reached is that cumulative impacts may be adverse but not significant. Ratios applied to recent projects involving impacts to nearshore hardbottom have generally supported a 1:1 ratio, where mitigation employed was expected to succeed. We have agreed to 6 month advance for reef construction as discussed in response N2 and it is important to note that due to the very low quality of habitat impacted, this will mitigate for impacts. As cited in Table 3.13 of the DSEIS, this lower quality Nearshore habitat can be replicated, but may be logistically difficult.

M5 Comment: *DSEIS Section 4.20.* There is no discussion of cumulative impacts to sea turtles. Erosion of nests, possible temperature lethal limits (Wibbels), increased energy expenditures from abandoned nesting attempts, and reduced hatch and emergence success are all beach related issues. The significance of nesting along the east coast of Florida, with the

multitude of projects underway or planned, warrants discussion of cumulative impacts.

Response: Due to the compatibility of the sand source to native beach sand the research sited in Section 4 indicates that nesting activity would not be expected to be adversely impacted for more than one season. (See Appendix C for the Cumulative Assessment and sections 6.13 and 6.12).

M6 Comment: *DSEIS Table 4.1 (page 102).* The Phipps project is listed for two fill cycles in the "Present" section. In the "Proposed" section, it has an additional 3.1 acres of hardbottom impact listed.

Response: It is appropriate to identify the initial restoration of the Phipps Ocean Park area as a "Present" project and the future renourishment as a "Future" project. The nearshore hardbottom impact of the two projects is identical and refers to the same features. The initial fill will impact nearshore hardbottom, which will be re-exposed as the fill material is diminished by wave energy and sediment transport out of the Project Area. The same nearshore hardbottom will be impacted when the Project Area is renourished in the future.

M7 Comment: *DSEIS Appendix C, Section 2.1.* The sea turtle nesting data is presented for Lake Worth Inlet only. This area regularly receives fill material from the inlet maintenance dredging projects and is not representative of the Project Area or the adjacent areas. Data collected from the previously un-surveyed beaches north of the Project Area in 2002 indicated higher nesting densities. The limited data from this area prohibits establishing nesting trends and can be misleading. This section fails to report the significance of sea turtle nesting in the area, county, and statewide toward the recovery efforts for the three species that nest in this area (loggerhead, leatherback and green sea turtles).

Response: Sea turtle nesting data is presented in Appendix C as well as for the county in Section 3.5.1 of the DSEIS. The Applicant concurs that based on the available information for the Project Area, it is difficult to establish definitive nesting trends, however, the Applicant cannot create data which does not exist and the cumulative impact process only requires that best available data be used in making an assessment. In recognition of the lack of comprehensive turtle nesting data currently available in the area, the Applicant will, in accordance with the FDEP permit, prepare and conduct an extensive sea turtle nesting monitoring program before and after construction of the project. Specifically, daily sea turtle nesting surveys will be conducted from March 1st to October 31st and extensive compaction analysis of the post-construction beach are required, as identified in Appendix F, Part IV – Marine Sea Turtles. Finally, a Juvenile Marine Sea Turtle Monitoring Plan approved by FDEP will be implemented in association with the project.

M8 Comment: *DSEIS Appendix C, Section 6.3.2.* With the general increasing trend in sea turtle nesting totals statewide, it is unlikely that the increase in nesting in this area is due to the sand transfer plant pumping. More beach does not necessarily result in more sea turtle nesting and information should not be presented as such. The cumulative impacts from beach projects in the area and along the east coast of Florida have not been studied. Therefore, claims regarding cumulative impacts cannot be made.

Response: The Applicant concurs with the first statement and the DSEIS has been modified to reflect this comment. The Applicant concurs that a cumulative impact study along the

southeast Florida coast has not been done, however, the material presented in Appendix C is based upon best available information, as required by CEQ guidelines.

M9 Comment: *DSEIS Appendix C, Section 8.1.* As improvements in inlet bypassing are making up for the erosion rate cited, and numerous fill projects are in the pipeline, it is likely that cumulative effects will include indirect burial of hardbottom.

Response: The Applicant concurs this is a possibility and would refer to Appendix C. It should be noted that indirect impacts are tough to project and that modeling is typically done to estimate indirect impacts on a project-by-project basis.

M10 Comment: I would like to raise the question here, why this is not a programmatic EIS? I was told about a year ago, that a full programmatic EIS would be launched. I believe it is essential, that cumulative impacts be considered and organized. I believe that like projects, inlet to inlet, should be considered together and not pulled out separately, like a small piece that is being considered here today, as well as those in the future.

Response: This project falls within the study area evaluated under an existing *Coast of Florida Erosion and Storm Effects Study & EIS – Region III (October 1996)* completed by the Corps of Engineers, Jacksonville District. The District determined that the most appropriate manner to evaluate the Phipps Ocean Park Beach Restoration Project would be to prepare a supplemental EIS, as allowable and supported by the District. Non-federal projects are funded and designed independently of each other and are thus difficult to lump for analysis purposes without common design and modeling information. It should be recognized that the Cumulative Assessment in Appendix C is thorough and seeks to identify all future nourishment projects in the study area, whether undertaken by the Applicant or not. However, the Applicant was required to rely on existing data from other entities for many past and planned future projects. A more programmatic evaluation of beach restoration projects on the southeast Florida coast is a sensible recommendation and may be prepared in the future should the Corps and local project sponsors agree.

N – ESSENTIAL FISH HABITAT

N1 Comment: The EFH Assessment and related information contained in the DSEIS provides a reasonably complete description of the EFH functions and project related impacts to EFH. The assessment concludes that habitat functional value reductions involving nearshore hardbottom communities would be offset by establishment of similar replacement habitat. NOAA Fisheries (NMFS) finds that this determination does not adequately consider the project's proximity to Lake Worth Inlet and the role of existing nearshore hardbottom as a recruitment site for larval and juvenile nearshore fishes. The determination, as provided in the DSEIS, that a more stable offshore reef may provide refuge for nearshore fishes is unsubstantiated since the ecological functions of the reefs found at varying distances from shore may be considerably different.

Response: The Applicant concurs that the nearshore habitat may provide these important functions and that there are differences between the nearshore habitat and offshore reef areas proposed for construction (See Table 3.13).

N2 Comment: NMFS EFH Conservation Recommendation #1. Planned construction of a replacement reef at least six months in advance of project implementation (beach nourishment) is necessary to address loss of reef function.

(See also Comment Q7). To compensate for delay, if any, in initiation of replacement reef construction, the Applicant shall be required to build an additional 0.30 acre replacement reef for each 30 day period in which reef construction falls short of the established six month advance period. This replacement shall be invoked for any portion of a successive 30-day period.

Response: The Applicant accepts the NMFS recommendations.

N3 Comment: NMFS EFH Conservation Recommendation #2. Continuous monitoring of the dredging and disposal activities shall be performed to ensure that all environmental safeguards are met and work is limited to designated locations. Work shall be immediately terminated if compliance with environmental protection requirements are not met, unforeseen significant environmental damage is observed, or work occurs outside of established work sites. (See also Comment R5).

Response: As provided in the FDEP permit and described in Appendix F, dredging and disposal activities will be carefully monitored during construction of the project. During the dredging operation, turbidity monitoring will be provided at the borrow site and placement area every six hours at the surface and 1 meter above the bottom. If monitoring reveals turbidity levels greater than 29 Nephelometric Turbidity Units (NTUs) above associated background levels, construction activities must cease immediately. Diver surveys of the benthic community on hardground features in the vicinity of the borrow areas are also required on at least a weekly basis and any adverse impacts must be reported to the FDEP immediately. Monitoring of the offshore reefs during construction, vessel controls, and the 400-foot "no-dredge buffer" will serve to ensure protection of the reefs. Biological Monitoring requirements are also detailed in Appendix F including biological monitoring of the nearshore hardbottom, mitigation reef, and hardbottom adjacent to the borrow areas. In addition, sand quality control monitoring is required to ensure suitability of the borrow material and marine sea turtle nesting and juvenile sea turtle monitoring will be conducted to assess the potential impact of the project on these species. Finally, to ensure protection of manatees monitoring and operational limits have been imposed in the FDEP permit and are detailed in Appendix F, Part IV. (See also Appendix G, Vessel Operations Plan).

N4 Comment: NMFS EFH Conservation Recommendation #3. Prior to project implementation, the Applicant shall evaluate the feasibility of limiting nourishment to the immediate vicinity of DNR Monuments R-116 and R-117 where significant erosion has occurred. The results of this evaluation shall be provided to the Corps of Engineers for consideration and possible implementation. (See also Comment C7).

Response: Please see response to C7**.**

N5 Comment: NMFS EFH Conservation Recommendation #4. A monitoring plan shall be developed to determine the effectiveness of the proposed artificial reef. The plan shall effectively monitor the stability of the reef and the composition of associated biota. Particular emphasis shall be placed on comparative utilization by fish life history stages with regard to materials used in reef construction (natural rock vs. concrete), location relative to distance from the beach, and water depth. (See also Comment Q6).

Response: The Applicant concurs with the recommendations. See Appendix F as to specific monitoring requirements for the Phipps Ocean Park Project. The FDEP permit requires

the Applicant to perform, among other things, underwater surveys of the mitigation reef, with video documentation, before and after construction and annually for three years, unless otherwise extended by FDEP. Reports detailing the post-project surveys must be submitted to FDEP and will also be provided to the USACE and federal resource agencies. Each report must contain an analysis and discussion of the video documentation in regards to any burial, subsidence and stability of the mitigation reef, sedimentation, or trauma that has affected the marine algae, coral, sponges, and other related biological communities. In addition to the standard monitoring of physical stability and taxonomic lists of species, the Applicant is required to include ecological comparisons of adjacent hardbottom reefs and examine variables such as indices of recruitment for larval/juveniles, predation rates and prey vulnerability, and size structure of fish and selected invertebrates.

N6 Comment: In an effort to move forward with project authorization, NOAA Fisheries (NMFS) concludes that incorporation of the above four listed EFH Conservation Recommendations into the Department of the Army permit for the project would resolve our concerns and no further action relevant to our evaluation options involving the MSFCMA or Section 404(q) of the Clean Water Act would be pursued.

Response: The Applicant concurs.

O – MARINE SEA TURTLES

O1 Comment: The DSEIS fails to consider the use of nearshore hardground by juvenile Green Turtles.

Response: While it is discussed in Section 3, The Applicant concurs that comprehensive data and information regarding potential use of nearshore hardbottom by juvenile sea turtle in the Project Area does not exist and the scientific understanding of this issue is currently incomplete. Section 4.5 has been modified as needed to incorporate a more complete discussion of this issue. However, in light of the emerging scientific understanding of this issue, the Applicant is required to develop and submit for FDEP approval a Juvenile Green Turtle Monitoring Plan that must be implemented in association with the project and monitoring of the mitigation reef and control areas. The Phipps project will, in effect, provide the best, most recent data regarding juvenile Green Sea Turtle use of nearshore hardbottom in the Project Area.

O2 Comment: The DSEIS fails to address direct, indirect and cumulative impacts to sea turtle nesting.

Response: Section 4.5 addresses direct impacts and Appendix C, Cumulative Impact, discusses cumulative impacts. Section 4.5 has been edited to incorporate more information on potential indirect impacts.

O3 Comment: There is no historic town-wide sea turtle nesting data.

Response: The Applicant concurs there is limited information, however, the Applicant cannot obtain data that does not otherwise exist. The Applicant, as part of this project, will be required to undertake the first comprehensive analysis of marine sea turtle nesting occurrences in the Project Area. (See Appendix F, Part IV – Marine Sea Turtles, including daily nest surveys from May 1 to October 31).

O4 Comment: Conceding that the Project Area experienced a net increase in dry beach area from 1985 -2000 (Appendix C, Table 7), the purpose of including nesting habitat (as a project purpose) is unclear.

Response: This increase was at the lower end of the beach profile distances, much of what is not considered viable nesting habitat, with only a shallow sand layer over beach rock. The project will restore nesting areas that are severely eroded or have experienced some impact, thus reducing the viability of the sand habitat for nesting.

O5 Comment: *DSEIS Section 3.5.1.* In general, this section fails to report the significance of sea turtle nesting in the area, county, and statewide toward the recovery efforts for the three species that nest in this area (loggerhead, leatherback and green sea turtles). The nesting density information provided does not specify which areas the data represents in relation to the Project Area or the adjacent areas. Nesting data collected from the previously un-surveyed beaches north of the Project Area in 2002 indicate higher nesting than expected and compared to the adjacent areas.

Response: Based on available data, the Appendix C, Table 8, does in fact provide sea turtle nesting data for the three species identified by the commenter, including the location of the nests relative to the Project Area, which is located in Reach 7. The SEIS also discusses the general sea turtle nesting habits and trends statewide in Appendix C, Sections 6.1.3, Sea Turtle Nesting and Foraging Habitat, Section 6.2, Characterization of Stress Factors, and Section 6.3, Trend Analysis and Baseline Conditions. The FSEIS has been edited to provide additional data in response to the comment. (See FSEIS sections 3.5 and 4.5).

O6 Comment: *DSEIS Section 4.5.3.* The discussion concerning impacts to sea turtles is incomplete. There is no discussion of nest washout or erosion following construction and subsequent equilibration of the beach. The assumption is made that turtles simply nest elsewhere following the project with no negative effects. While it is documented that nesting appears to take place elsewhere, the consequences to those animals failing to nest is not known.

Additionally there is no discussion relating to the changes to sediment temperature and incubation environment. Temperature may account for the lower hatch success documented on nourished beaches in Martin and Palm Beach Counties in 1999.

Efforts to eliminate impacts from erosional losses may be impossible due to high nesting densities or permit conditions. Early completion of the project to allow subsequent equilibration prior to nesting season has been documented to reduce erosional impacts (Juno Beach, 2001).

Response: The DSEIS has been modified to address the above comments. (See FSEIS sections 3.5 and 4.5).

O7 Comment: *DSEIS, Appendix C, Section 6.2.2.* Other effects to sea turtles not discussed include unusual and seaward nest placement, scarping, temperature, energy expenditures from abandoned nesting attempts, and other unknown factors contributing to reduced crawl (both nests and non-nesting emergence) activity.

Response: Available data on the topics above was presented in the DSEIS; however, Sections 3.5 and 4.5 have been modified in the FSEIS to more fully address the above comments. In addition, the specific concerns regarding scarping, temperature, sand compaction, and nesting success are specifically accounted for in the post-project Sea Turtle Monitoring Program outlined in Appendix F, Part IV. The Applicant must monitor sand compaction for three years following construction of the project and the Applicant under the direct supervision of FDEP must address problems identified. For three

nesting seasons following construction, the Applicant is required to conduct weekly visual surveys for escarpment formation and to take corrective action to eliminate the escarpment. The Applicant must carefully monitor nesting activity for three seasons following construction (including data for two years prior to construction), noting all activity, nesting success rates, hatching success rates, location and date of any observed dead, injured or sick species.

P – MITIGATION REEF

P1 Comment: The proposed mitigation reef will not be constructed at the same depth as nearshore hardground habitat impacted by the project. It remains to be demonstrated whether the proposed artificial reef structure (s) will compensate for the losses attendant to project impacts. In (EPA's) letter dated September 25, 2001, EPA requested that the SEIS include an analysis of the functions and values provided by artificial reefs (placed at different depths) compared to those of the affected natural hardbottoms. In (EPA's) estimation, this is an important evaluation since this project will impact a narrow band of hardbottom resources located adjacent to and encompassing the entire 1.9-mile project length.

Response: The Applicant recognizes the difference in the depth of the impacted nearshore hardbottom resources and the proposed mitigation reef. However, the difference between persistent and ephemeral hardbottom in terms of larval fish utilization is not well understood. This issue was specifically identified as a concern in the development of the Mitigation Reef Plan (Appendix E) and addressed in the FDEP permit. The hardbottom that will be buried by beach construction provides structural habitat for motile organisms. The artificial reef is expected to provide similar structural habitat for the same assemblage of motile organisms. Given the timing of installation (at least 6 months prior to impact) and the close proximity of the mitigation site to the impact site, these organisms will be able to relocate to the artificial reef and are expected to begin doing so immediately. Although the sessile organisms currently living on the hardbottom within the impact site will be lost when they are covered by fill, colonization of the artificial reef by epi-benthic species similar to those inhabiting the natural hardbottom is expected to occur within the first year. Previous similar nearshore artificial reef mitigation projects have been successful in offsetting such impacts.

Although the assemblage of fish species that will utilize the artificial reef is expected to be the same as the assemblage currently utilizing the nearshore hardbottom, utilization of the two habitats by different age classes is not well understood. Studies have shown that larval fish of some species either select or have a higher survival rates in nearshore hardbottoms. However, we don't know if the difference in depth, wave energy, and topography between impacted hardbottoms and the artificial reef are enough to make a difference for these larval fish. Given the limitations associated with constructing an artificial reef that more closely simulates the low relief, ephemeral hardbottoms in the surf zone (including stability, safety, and economic factors), the permittee chose to construct the mitigation reef beyond the surf zone in slightly deeper water and with boulders rather than flat substrate.

If the low relief, ephemeral hardbottom in the surf zone is providing essential habitat to some component of the nearshore fish community that is not also provided by the mitigation, then accepting a slightly different type of habitat as mitigation for this and future nourishment projects could cause an unacceptable cumulative impact. <u>In order to avoid this potential problem,</u>

the FDEP permit requires the Applicant to conduct a long-term study to compare the utilization of the two habitat types throughout the region. In addition to fish species and age classes, the study will also look at colonization by macroalgae and utilization by marine turtles as feeding habitat (emphasis added).

P2 Comment: The Applicant has proposed creation of a 3.1-acre mitigation reef to offset the impact to nearshore hardbottom resources. In-kind mitigation for impacted nearshore substrate in conjunction with conscientiously conducted nourishment construction should provide for meeting the project objectives while maintaining habitat and associated ecological services.

Response: The Applicant concurs with this comment.

P3 Comment: Recent mitigation efforts (similar to those proposed by the Applicant) along both the east and west coast of Florida have been successful in providing vertical structure and substrate matrix for establishment of nearshore hard bottom biological assemblages.

Response: The Applicant concurs with this statement.

P4 Comment: Deployment and maintenance of stable artificial structures in a water depth range similar to the nearshore hardbottom will provide substrate for recruitment and settlement of algae, invertebrates, and fish species impacted and/or displaced during nourishment operations within the Project Area.

Response: The Applicant concurs with this comment. The mitigation reef, while not identical to the nearshore ephemeral hardbottom, is similar in depth and character to the features impacted. As described in response to Comment P1, the post-project assessment of the Phipps Mitigation Reef will provide significant new data and understanding of these issues.

P5 Comment: The Applicant proposes to compensate for the direct impact to (nearshore) hardbottom habitats by providing one acre of reef mitigation for each acre impacted. The Applicant proposes that the artificial reef be constructed six months prior to the beach fill but the department believes it will likely take more than six months for the artificial reef to function at the same level as the existing hardbottom. To fully compensate for all impacts, including temporal lags, the Applicant should provide a mitigation ratio of 2:1.

Response: The Applicant agrees with the NMFS (see Comment P7) that construction of the 3.1-acre mitigation reef is sufficient, provided that the reef is actually in place six months prior to construction of the beach fill. The request to increase the mitigation ratio is not appropriate for this project, unless the construction of the reef is delayed. The Applicant is committed to meeting the requirement to construct the reef six months in advance of the beach fill, as required in the FDEP permit. In light of the advance construction of the mitigation reef, a temporal lag analysis using the approach developed by the Corps has not been performed. Based on analysis for other similar projects (e.g. Sector 1 and 2, Indian River County) a 1:1 ratio is appropriate if the reef construction is completed six months before beach construction. In other cases – such as Red Reef Park – a 2:1 mitigation was required, however, such a ration is not appropriate in this case, as indicated by the NMFS.

P6 Comment: The DSEIS indicates 3.1 acres of nearshore hardbottom impacts, based

on averaging summertime hardbottom surveys dating back to 1994. Wintertime surveys were not included. The Department of the Interior believes that this technique underestimates impacts to hardbottom resources and we recommend that both winter and summer surveys be considered in the analysis.

Response: As explained in Appendix E, Reef Mitigation Plan and Monitoring Program, the exclusion of wintertime hardbottom surveys was undertaken in consultation with FDEP to avoid bias in the mitigation planning process. Controlled aerial photography of the Project Area was conducted ten times between 1983 and 1999. The aerial photography indicates that exposed nearshore hardbottom acreages ranged from 0.57 to 4.88 acres within this time period. The December 1999 aerials indicate that 4.24 acres of hardbottom was exposed and located below the Mean Low Water Line. It was acknowledged by FDEP that due to the effect of recent storm events, time averaging would be utilized. Further, to avoid bias in the time-average procedure, winter aerials were excluded from the analysis to factor out seasonal fluctuation and aerials greater than five years old were excluded to factor out historical bias. Time-averaging analysis of summer surveys dating back to 1995 were used and indicated 3.1-acres of hardbottom impact. For verification, the summer 2000 aerials were also analyzed and found 3.2-acres of hardbottom in the Project Area, a figure consistent with the time averaging for 1995 to 1999. The FDEP specifically determined that the proposed mitigation plan is adequate to offset the anticipated impacts to nearshore hardbottom.

P7 Comment: NMFS EFH Conservation Recommendation #1. Planned construction of a replacement reef at least six months in advance of project implementation (beach nourishment) is necessary to address loss of reef function. (See also Comment N2). To compensate for delay, if any, in initiation of replacement reef construction, the Applicant shall be required to build an additional 0.30 acre replacement reef for each 30 day period in which reef construction falls short of the established six month advance period. This replacement shall be invoked for any portion of a successive 30-day period.

Response: The Applicant agrees to this recommendation.

P8 Comment: *DSEIS, Appendix E, Mitigation Reef Monitoring*. Recent analysis and evaluation of the Juno Beach artificial reef fish communities has indicated that roving fish counts are a more effective sampling method than the fish counts using the modified Bohnsack method. In the Juno area, larger than expected sample sizes are needed to accurately evaluate fish diversity and abundance. Power analysis should be performed to evaluate the effectiveness of the sampling program.

Response: The Applicant concurs with this recommendation and has edited the monitoring plan to reflect this change.

P9 Comment: The proposed mitigation reef will be constructed approximately 500' north of the project site. However, the SEIS did not include sufficient data about this location (and depth) to make a determination as to its effectiveness (long-term) as mitigation for the expected losses. Further, EPA is concerned that in the absence of sufficient underlying support (hardbottoms), the reef material will eventually sink into the sand, as occurred at Juno beach when a similar mitigation structure was built over a sandy substrate.

Response: In concert with plan formulation for the project, jet probes were conducted to evaluate the depth to the underlying rock and the mitigation reef location was selected to

insure stability of the constructed reef. Based on the jet probe analysis, the reef mitigation plan provides for creation of a 3.1-acre mitigation reef, after settlement of the structures. The stability of the reef has been evaluated and directly addressed in the mitigation design and post construction monitoring of the reef. Appendix E, Mitigation reef Monitoring, requires the Applicant to perform a post-construction stability analysis of the mitigation reef for a period of three years following placement, including trends in subsidence, coverage, and scouring. If the reef fails to maintain the required coverage, the FDEP requires the Applicant, under order from FDEP, to take action to make up the difference in the required size of the mitigation reef (See Appendix F, Part I, Section (2)(b)).

P10 Comment: The proposed mitigation reef consists of clustering reef structure in one 3.1-acre block, which already contains natural nearshore hardbottom communities. (EPA) agrees that the reef structure is desirable, but it has not been demonstrated whether this dense concentration of material at one point on the shoreline compensates for some of structure along an almost two mile reach. Hence (EPA) is pleased to note that there will be a research effort that will attempt to determine whether construction of a discrete reef adequately provides the necessary in-kind mitigation for the loss of linear nearshore hardbottom resources. If results of this study indicate that this is not the case, there should be a commitment to provide additional mitigation.

Response: The FDEP permit requires a post-construction evaluation of the Mitigation Reef for a period of three years, including extensive surveying and reporting on the nature of the biological assemblages on the mitigation reef in comparison to the nearshore ephemeral features impacted. The Applicant is also required to provide additional mitigation if the surveys indicate the mitigation reef is not sufficient compensation. Prior to beginning construction of the mitigation reef, the Applicant is required to provide a drawing of surveyed coordinates for the reef and all work spaces (staging areas, etc.) that will be used in construction of the reef. In addition, the Applicant is required to include surveys of all hardbottom within 1,000 feet of the mitigation reef site. Finally, the Applicant is required to construct the artificial reef to mimic the natural hardbottom in the Project Area, including 1 feet to 4 feet relief, overhanging ledges, and crevices. The reef materials will be placed in a shore-parallel fashion, not in a compact area, as assumed in the comment. Post-project monitoring reports will address: bathymetry, fish diversity & abundance, algal and invertebrate diversity & abundance, species list, and target species assessment, including corals and green turtles.

P11 Comment: *Appendix E, Reef Mitigation & Monitoring Program.* Appendices E and F reference the State agencies (primarily FDEP) primarily responsible for approval and acceptance of the proposed mitigation together with natural resources addressed in the SEIS. However, there are federal agencies that also have this responsibility and they should be noted in the Final SEIS.

Response: The Applicant concurs with this comment.

Q – ENVIRONMENTAL MONITORING

Q1 Comment: Proposed monitoring program will assess the relative success of artificial structures as in-kind mitigation for project specific nearshore hardbottom habitat and provide guidance in future renourishment efforts.

Response: The Applicant concurs with this comment.

Q2 Comment: The Applicant proposes to conduct diver inspections of the benthic communities adjacent to the borrow area at least weekly during the dredging operation. The plan further proposes that FDEP will be notified if impacts to reefs are observed. Dredging could be considered an impact to benthic organisms, if the diver observes significant accumulation of sediments, or if benthic organisms exhibit other signs of stress such as excessive mucous production, extended polyps, or discoloration. However, the plan did not indicate whether dredging operations would be suspended, and if so, for how long.

Response: If any dire or unacceptable signs of impacts are detected the dredging operation would be suspended until it was determined how the impact occurred and what appropriate measures were necessary to prevent this from occurring.

Q3 Comment: During dredging operations, the Department of Interior recommends diver monitoring efforts be increased from weekly to bi-weekly to provide greater protection for hardbottom reefs adjacent to the borrow areas.

Response: Water quality/turbidity and monitoring in the vicinity of the borrow area and beach fill placement area will, in accordance with the FDEP permit, be conducted every six hours during construction. In the FDEP permit, the Applicant is required to conduct biological surveys of the benthic hardbottom communities adjacent to the borrow areas "at least weekly" using qualified diver biologists. (See Appendix F, Part I, (2) c). If conditions indicate that weekly surveys are not sufficient under actual project conditions, surveys will be conducted more frequently than weekly, as provided in the permit, subject to available funds.

Q4 Comment: The monitoring protocol should include direct measurements of sediment accumulation. Dredging should be stopped for at least one-week in areas where sediment levels on the reef are found to exceed 1.5 mm average daily depth. Dredging could resume when monitoring demonstrates that corals are no longer stressed.

Response: As required by the FDEP permit, the Applicant agrees to monitor sediment accumulation at the borrow site and beach fill placement area every six hours during construction. If monitoring indicates unacceptable turbidity impacts (greater than 29 NTU), the FDEP permit requires that construction activities "cease immediately and not resume until corrective measures have been taken and turbidity levels return to acceptable levels." We believe this standard is responsive to the comment submitted.

Q5 Comment: NMFS EFH Conservation Recommendation #2. Continuous monitoring of the dredging and disposal activities shall be performed to ensure that all environmental safeguards are met and work is limited to designated locations. Work shall be immediately terminated if compliance with environmental protection requirements is not met, unforeseen significant environmental damage is observed, or work occurs outside of established work sites. (See also Comment R5).
Response: The Applicant concurs with this comment.

Q6 Comment: NMFS EFH Conservation Recommendation #4. A monitoring plan shall be developed to determine the effectiveness of the proposed artificial reef. The plan shall effectively monitor the stability of the reef and the composition of associated biota. Particular

emphasis shall be placed on comparative utilization by fish life history stages with regard to materials used in reef construction (natural rock vs. concrete), location relative to distance from the beach, and water depth. (See also Comment N5).

Response: The monitoring plan has been revised to reflect the above comment.

Q7 Comment: *DSEIS, Appendix F, Part 4, Marine Sea Turtles*. In order to maintain consistency with other monitoring efforts throughout the State and county, Palm Beach County recommends the following changes: Section m. Samples should be collected from just above the high water line; Section m(i) - the material should be removed from the hole to ensure accurate readings; Section m(ii) - there should be a minimum of five (5) replicate readings; and Section p - the sea turtle report needs to include analysis of (1) Historical nesting densities and nesting success, (2) Washout/erosion rates, (3) Nest placement (relative to dune and high water line), (4) Hatch and Emergence success of all or at least 100 nests left in place within the fill beach area and an equal number of nests from nearby "control" non-nourished beaches, (5) Sediment compaction summary, and (6) Sediment grain size analysis.

Response: The Applicant concurs with the above recommendations.