Table 18
Regulatory Compliance

Regulation	Lead Agency	Compliance Determination
National Environmental Policy Act of 1969	U.S. Environmental Protection Agency	
State Environmental Policy Act of 1971	NC Department of Environmental and Natural Resources	
Endangered Species Act of 1973	U.S. Fish and Wildlife Service & National Marine Fishery Service NC Department of Environmental and Natural Resources	
Fish and Wildlife Coordination Act of 1958	U.S. Fish and Wildlife Service U.S. Army Corps of Engineers	
National Historic Preservation Act of 1966	NC State Historic Preservation Office	
North Carolina Archaeological Resources Protection Act as amended in 1988	NC Office of State Archaeology	
Clean Water Act of 1972 Section 404 Section 401	U.S. Environmental Protection Agency U.S. Corps of Engineers NC Division of Water Quality	
Clean Air Act of 1972	U.S. Environmental Protection Agency NC Department of Environmental and Natural Resources	
Coastal Zone Management Act of 1972	National Oceanic and Atmospheric Administration Ocean and Coastal Resource Management	
Coastal Area Management Act of 1974	NC Department of Environmental and Natural Resources	
Marine Mammal Protection Act of 1972	U.S. Fish and Wildlife Service	
Federal Water Project Recreation Act as amended in 1976	U.S. Fish and Wildlife Service	
Fishery Conservation and Management Act of 1976	National Marine Fishery Service	
Submerged Lands Act of 1953	National Oceanic and Atmospheric Administration NC Department of Coastal Management	
Coastal Barrier Resources Act / Coastal Barrier Improvement Act of 1990	U.S. Fish and Wildlife Service	
Rivers and Harbors Act of 1899	U.S. Army Corps of Engineers	
Anadromous Fish Conservation Act as amended in 1965	National Marine Fishery Service U.S. Fish and Wildlife Service	
Migratory Bird Treaty Act as amended 1998 Migratory Bird Conservation Act as amended 1989	U.S. Fish and Wildlife Service	
Magnuson-Stevens Fishery Conservation and Management Act of 1996	National Marine Fishery Service	

5.25.5 **Clean Water Act**. An application for Section 401 Water Quality Certification will be submitted to the North Carolina Division of Water Quality. All State water quality standards will be met under this project.

A Section 404 evaluation under the Clean Water Act will be applied for and included as Appendix A. The project is expected to be in full compliance with this Act.

5.25.6 **Clean Air Act**. No air quality permits will be required for this project. Exhaust emissions from labor transport and dredge equipment would likely be well under the *de minimus* levels for ozone non-attainment areas (40 CFR 91.853).

In response to a U.S. Environmental Protection Agency requirement, the state of North Carolina recommended that 11 counties and parts of 24 others be designated by the federal government as not meeting air pollution control standards for ozone. Neither Onslow nor Carteret County was listed as non-attainment areas in the State of North Carolina. A final decision based on the recommendations provided by North Carolina will be made by the EPA in April 2004 to determine which areas are listed as non-attainment areas.

Non-attainment areas are the focus of air quality plans for controlling ozone in the State of North Carolina. These plans would include specific proposals for curbing ozone, such as measures to reduce emissions from cars, trucks, industries, and power plants.

This project is being coordinated with the U.S. Environmental Protection Agency (EPA) and will be in compliance with Section 309 of the Act. The Environmental Impact Statement developed for this project will be forwarded to the EPA for their comments.

5.25.7 **Coastal Zone Management Act**. A federal consistency determination in accordance with 15 CFR 930 Subpart C will be included in this report. State consistency review will be performed during the coordination of the Draft EIS document to ensure that the project is consistent with the North Carolina Coastal Area Management Act (CAMA) of 1974, as amended 1981 (Ch. 932, s. 2.1).

5.25.8 **Marine Mammal Protection Act**. Incorporation of the safe guards used to protect threatened and endangered species during dredging and disposal activities would also protect any marine mammals in the area, therefore, this project is in compliance with the Act. A trained and government certified sea turtle and marine mammal observer will be stationed on the dredge during all water-related construction activities. Appropriate actions will be taken to avoid listed sea turtle and marine mammal species effects during project construction. If a marine mammal is identified within the project boundaries, they will be provided

protections equal to the ESA species that have had consultations completed, and as a result of this the project sponsor is in compliance with the Act.

5.25.9 **Federal Water Project Recreation Act**. The principles of this Act (Public Law 89-72) as amended will be fulfilled by complying with cost sharing responsibilities as outlined in Section 3 (a)1.

5.25.10 **Fishery Conservation and Management Act**. Coordination with the National Marine Fisheries Service (NMFS) will continue during the review of the Draft EIS. The project will be in full compliance with this Act.

5.25.11 **Submerged Lands Act**. The project will occur on submerged lands of the State of North Carolina. The project will continue to coordinate with the State to ensure full compliance with this Act.

5.25.12 **Coastal Barrier Resources Act and Coastal Barrier Improvement Act**. The western side of Bogue Inlet, including Dudley Island and Hammocks Beach State Park, is listed as an undeveloped coastal barrier as defined by the Coastal Barrier Resources Act. The project will require coordination with the U.S. Fish and Wildlife Service prior to nourishment activities.

5.25.13 **Rivers and Harbors Act**. The proposed activities will involve a temporary restriction of navigable waters of the United States. This temporary restriction will last for no more than 30 days and will occur when the usage of the waterway is at its lowest. The proposed action is subject to the public notice, pubic hearing, and other evaluations normally conducted for activities subject to the act. The project will be in full compliance with this Act.

5.25.14 **Anadromous Fish Conservation Act**. The project will be coordinated with the National Marine Fisheries Service and will be in compliance with the Act.

5.25.15 **Migratory Bird Treaty Act and Migratory Conservation Act**. Monitoring efforts of the project include identifying the bird species that utilize the project area prior to and post-construction activities. The project is not expected to affect the migratory birds that utilize the area, however a full assessment will be conducted as part of the project efforts. The project will be in full compliance with this Act.

5.26 APPLICANT'S PREFERRED ALTERNATIVE

Alternative F, channel relocation with beach nourishment, positively addresses all of the project's needs and objectives and would not significantly impact environmental resources in the area. Therefore, Alternative F is the Applicant's Preferred Alternative. Negative impacts associated with the implementation of Alternative F would include: (a) temporary increase in turbidity in Bogue Inlet during

channel and sand dike construction; (b) temporary increases in turbidity at the discharge point during nourishment of the Phase 3 shoreline; (c) burial of infauna prey resulting from beach nourishment; (d) temporary decrease in tidal flow as the inlet adjust to the new channel (4 to 6 weeks); (e) increase bed load transport into Eastern and Western Channels during the 4 to 6 week channel adjustment period; (f) removal of 50 acres of shallow bottom habitat due to channel construction; and (g) cumulative negative impacts due to erosion of the western 7,500 feet of ocean shoreline on Emerald Isle. Positive environmental impacts include: (a) partial restoration of 25 acres of subtidal and intertidal habitat from the construction of the sand dike; (b) restoration of the inlet shoreline habitat with the development of a sand spit off the west end of Emerald Isle; (c) accretion of the eastern 7,500 feet of ocean shoreline on Bear Island; (d) relatively rapid recovery of the beach nourishment area due to the highly compatible nature of the inlet material; (e) creation of new shorebird, waterbird, and colonial waterbird habitats with the gradual filling of the existing channel and sand spit development; and (g) prevention of anthropogenic pollution and solid waste disposal due to the destruction of utilities and other infrastructure in the Pointe subdivision. Positive economic impacts would include the preservation of the town and county tax bases, maintenance of the Emerald Isle economy by preventing a reduction in household spending, increased recreational opportunities resulting from the restoration of public beach access to the inlet shoreline to past conditions, creation of a high quality recreational beach along the 23,831 feet of ocean shoreline included in Phase 3, and accomplish the protection of the Pointe subdivision and restoration of the town's ocean shoreline in one operation.

5.27 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.27.1 **Irreversible**. Alternative F would remove 47.6 acres of subtidal habitat from the middle of Bogue Inlet and replace it with relative deepwater habitat. New intertidal and subtidal habitat would immediately begin to form with the development of a sand spit off the west end of Emerald Isle. The sand spit would eventually fill approximately 131.8 acres of deepwater habitat associated with the existing channel essentially offsetting the impacts of the channel construction. After approximately 4 to 6 years, the physical conditions within Bogue Inlet, in terms of intertidal and subtidal habitat, will resemble the existing composition of these resources. In this regard, the new channel, which would be constructed to a depth of 13.5 feet below NGVD, would shoal back to depths comparable to the existing channel in approximately 1 to 2 years. Therefore, no cumulative net gain or loss of these resources is expected.

The material removed from Bogue Inlet to nourish the Phase 3 shoreline (approximately 809,500 cubic yards) will be replaced over time by the influx of abandoned ebb tide delta material lying off the west end of Emerald Isle and the movement of material off the western 7,500 feet of Emerald Isle. The movement

of material off the western 7,500 feet of Emerald Isle will result in erosion of this shoreline; however, some of these erosive impacts will be mitigated by the Phase 3 beach fill that will extend into the shoreline impact area and the continued disposal of navigation maintenance material on the extreme west end of Emerald Isle. The shoreline losses on Emerald Isle will be offset by comparable gains on the eastern 7,500 feet of Bear Island resulting in no net gain or loss of the beach resources. The use of the inlet material for beach nourishment would eliminate the disturbance of 141.5 acres of offshore bottom that would be required to nourish the Phase 3 shoreline from an offshore borrow area. While the resources within the offshore borrow area would eventually recover, the timeframe for this recovery could be considerably longer than the inlet and the character of the recovered area could probably differ from that of the existing environment.

5.27.2 **Irretrievable**. Under existing conditions, resources on the west end of Emerald Isle are in a constant state of flux due to the continued eastward migration of the inlet channel. The erosion of the inlet shoreline has impacted the normal use of the inlet area that had previously been enjoyed by residents and visitors to Emerald Isle. Continuation of the erosion would result in the irretrievable loss of beach and upland resources on the west end of Emerald Isle. At some time in the future, the Bogue Inlet channel could naturally be repositioned to a more central location between Bogue Banks and Bear Island; however, the resources lost prior to this natural adjustment would not be restored to their present condition resulting in an irretrievable loss. Relocation of the channel would maintain the character of the existing upland resources and allow for the recovery of the beach and dune resources along the inlet shoreline. Some beach and dune resources would be lost to erosion on the west end of Emerald Isle as the shoreline adjust to the new channel position, however, these losses would be offset by comparable gains on the east end of Bear Island and the inclusion of a portion of the impacted Emerald Isle shoreline in the Phase 3 beach nourishment project.

5.28 CONFLICTS AND CONTROVERSY

There are no known conflicts or controversy associated with the applicant's preferred alternative.

5.29 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS

The major uncertainty associated with Alternative F is the magnitude of the shoreline adjustments along the western 7,500 feet of Emerald Isle and the eastern 7,500 feet of Bear Island. The predicted amount of erosion on the west end of Emerald Isle following the relocation of the was based on the position the Emerald Isle shoreline occupied in September 1978 when the Bogue Inlet channel was located midway between Bogue Banks and Bear Island. The average amount of recession near the inlet (transects 10 to 13) was predicted to be 350 feet with a

maximum possible recession of 400 feet. Shoreline recessions for areas located between 5,000 and 7,500 feet east of the inlet (transects 1 to 5) should average around 10 feet but could erode as much as 80 feet.

Emerald Isle. Historic shoreline positions measured at transects on the west end of Emerald Isle (see Appendix C) were compared to determine the minimum shoreline position (i.e., the most landward shoreline position) for the period March 1943 to September 2001 with the results provided in Table 19. A plot of the minimum and maximum shoreline positions on Emerald Isle along with the predicted shoreline position is shown in Appendix C. Shoreline positions in Table 19 at each transect are given relative to the baseline shown on Figure 3.2 in Appendix B. Also given in Table 19 is the distance from the baseline to the predicted September 1978 shoreline, the predicted amount of shoreline erosion, and the distance from the front of houses to the predicted shoreline and the minimum shoreline.

As indicated in Table 19, the shoreline response in the vicinity of transects 1 and 2 could actually be accretion, however, if the shoreline adjusts to the minimum position, the shoreline could move much closer to the front of the houses. A mitigating factor for the area located between transects 1 and 6 will be the placement of beach fill as part of the Phase 3 beach nourishment project. This beach fill will widen the beach by approximately 40 feet between transects 1 and 2 with the width of the fill decreasing to zero near the west boundary of transect 6. The beach located between transects 8 and 12 will also receive periodic nourishment from the disposal of navigation maintenance material. These two nourishment actions should result in shoreline responses approximating the predicted shoreline rather than the minimum shoreline.

Table 19
Minimum and Predicted Shoreline Positions on the West End of Emerald Isle

Transect →	12	11	10	9	8	7	6	5	4	3	2	1
Min SL Position[1]	1327	1235	1170	1202	1149	1174	1156	1118	1179	1194	1177	1123
Predicted SL Position[2]	1383	1287	1188	1247	1254	1307	1266	1203	1260	1284	1349	1294
Sep. 2001 SL Position	1737	1663	1497	1451	1386	1340	1331	1294	1294	1284	1275	1275
Predicted SL Change[3]	-354	-377	-309	-204	-132	-33	-65	-90	-34	-1	+74	+19
Distance from House to Min SL Position	331	177	98	171	70	95	71	87	80	129	112	58
Distance from House to Predicted SL	387	229	116	216	175	228	181	172	161	219	284	229

[1] Minimum position from baseline during period March 1943 to September 2001
[2] September 1978 Shoreline Position measured from baseline
[3] Predicted shoreline change = (September 2001 shoreline position – September 1978 shoreline position)

Bear Island. The shoreline on Bear Island is predicted to accrete in response to the relocation of the Bogue Inlet channel. The predicted amount of accretion on the Bear Island was based on the shoreline returning to approximately the September 1978 position with predicted average accretion ranging from 470 feet for the

transects located immediately west of the inlet (transects 25 to 27) to 130 feet for transects 33 to 36 located between 5,000 and 7,500 feet west of the inlet. Historic shoreline positions on Bear Island and the maximum and minimum shoreline positions for the period April 1938 to September 2001 were evaluated with the results plotted and shown in Appendix C and given in Table 20.

Table 20
Minimum and Maximum Shoreline Positions on the East End of Bear Island
(April 1938 to September 2001)

Transect →	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**25**
Min SL Position	603	560	592	653	662	705	667	697	598	300	-118	-390
Max SL Position	976	954	954	981	1006	1035	1035	1107	1185	1268	1303	1429
Max Accretion[(1)]	373	394	362	328	344	330	368	410	587	968	1421	1819
Predicted Accretion [(2)]	105	138	167	173	199	194	222	265	297	369	431	618

[(1)] Difference between Maximum SL Position and Min SL Position
[(2)] Distance from September 1978 SL Position and September 2001 SL Position

Much of the uncertainty associated with the predicted shoreline adjustments on Emerald Isle is associated with horizontal stability of the relocated channel. Based on the behavior of the natural channel, the relocated channel should maintain a position west of the Pointe shoreline for a minimum of 15 years and a maximum of 35 years. If the relocated channel behaves in a manner different from the natural channel and rapidly returns to a position close to the Pointe shoreline, the amount of erosion on the west end of Emerald Isle would be less than predicted. In like manner, the predicted accretion on the east end of Bear Island would also be considerably less than predicted if the channel rapidly migrates back to the east. If the channel moves to the west, erosion on the west end of Emerald Isle would approach the maximum predicted recession while accretion on the east end of Bear Island would be greater than predicted.

5.30 **ENVIRONMENTAL COMMITMENTS**

5.30.1 **Mitigation/Conservation Measures.** The primary areas of concern with implementation of the preferred alternative are: (a) impacts on birds resulting from the possible restoration of pedestrian and vehicular access to the inlet shoreline; (b) unexpected impacts on submerged aquatic vegetation and shellfish beds due to increased sedimentation; and (c) shoreline changes on the ocean facing beaches on the west end of Emerald Isle and the east end of Bear Island. Mitigation/conservation measures that that are being considered or evaluated to address these concerns are described below.