

ENVIRONMENTAL ASSESSMENT
PROPOSED PLAN FOR ASKIROGA BAY SHORE
PROTECTION PROJECT

U.S. Army Engineer District, Honolulu
May 12, 1980

ENVIRONMENTAL ASSESSMENT
12 May 1980

Proposed Plan for
Askiroga Bay Shore Protection Project
Territory of Guam

The responsible lead federal agency is the US Army Engineer District, Honolulu, Hawaii. The responsible local agency is the Department of Public Works, Government of Guam. The cooperating federal agency is the US Fish and Wildlife Service, Hawaii.

Abstract: The project is located along the southeastern shoreline, adjacent to Highway 4 on the island of Guam. The project consists of a 250-foot-long rubblemound revetment with a crest elevation of 14 feet above Mean Lower Low Water (MLLW). The structure will have a facing slope of 1V to 1.5H. The project will protect the shoreline and adjacent Highway 4 from wave damage during hurricanes and severe storms.

None of the following exist within the project site: sites listed on the National Register of Historic Places, monuments or landmarks, valuable natural scenic or recreational areas, critical habitats for listed endangered species, wildlife or marine sanctuaries or refuges, prime agricultural lands, or important commercial or recreational fishing.

An evaluation of fill activities based upon EPA guidelines for the discharge of dredged or fill material under Section 404 of the Federal Clean Water Act of 1977 indicates that the material is suitable for discharge at the project site.

The project may result in a temporary increase in water turbidity. No human residences will be relocated or displaced. The project does not change the social structure, cohesion, or social well-being of the community. No modification of existing land-use plans will occur. No new permanent noise, air, or water pollution sources will be created by the project. The community considers Highway 4 to be a significant resource to be protected.

Based on the findings of this Environmental Assessment, the project does not have a significant effect on the quality of the human environment.

1. SUMMARY

1.01 Major Conclusions and Findings. The environmental impacts associated with the project are not anticipated to be significant. Adverse effects are confined to temporary degradation of the environment during construction. These adverse effects will be minimized by appropriate environmental protection specifications in the construction contract. On the basis of previous statements describing similar actions, the nature and scope of the recommended work, the lack of significant environmental impacts or controversy, and the mitigation of temporary adverse effects, it has been determined that an environmental statement is not required.

1.02 Areas of Controversy. None.

1.03 Unresolved Issues. None.

1.04 Relationship to Environmental Requirements. These relationships are shown on Table 1.

TABLE 1. RELATIONSHIP OF PLAN TO ENVIRONMENTAL REQUIREMENTS

<u>Federal Policies</u>	<u>Plan of Improvement</u>
Fish and Wildlife Coordination Act	In full compliance
Water Resources Planning Act	In full compliance
National Environmental Policy Act (NEPA)	In full compliance
National Historic Preservation Act (NHPA)	Coordination in process
Wild and Scenic Rivers Act	Not applicable
Endangered Species Act of 1973	In full compliance
Clean Water Act - Section 401	In full compliance
Section 402	No NPDES permit required
Section 404	In full compliance. Evaluation and public review not complete.
Marine Protection, Research, and Sanctuaries Act -	
Section 102	Not applicable
Section 103	Not applicable
Section 111	Not applicable
Floodplain Management (EO 11988)	In full compliance
Protection of Wetlands (EO 11990)	Not applicable

TABLE OF CONTENTS

	<u>Page</u>
1. SUMMARY	1
Major Conclusions and Findings	1
Areas of Controversy	1
Unresolved Issues	1
Relationship to Environmental Requirements	1
2. NEED FOR AND OBJECTIVES OF ACTION	2
Study Authority	2
Public Concerns	2
Planning Objectives	2
3. ALTERNATIVES	3
Plans Eliminated from Further Study	3
Without Conditions (No Action)	4
Plans Considered in Detail	4
Comparative Impacts of Alternatives	4
4. AFFECTED ENVIRONMENT	4
Environmental Conditions	4
5. ENVIRONMENTAL CONSEQUENCES	6
6. LIST OF PREPARERS	7
7. PUBLIC INVOLVEMENT	8
Public Involvement Program	8
Required Coordination	8

TABLE 1. (continued)

<u>Federal Policies</u>	<u>Plan of Improvement</u>
<u>State and Local Policies</u>	
Guam CZM Consistency Certification	In full compliance
Federal CZM Consistency Certification from DPED	In full compliance
<u>Land Use Plans</u>	In full compliance

2. NEEDS FOR AND OBJECTIVES OF ACTION

2.01 Study Authority. This study is conducted under the authority of Section 14 of the Flood Control Act of 1946, as amended, and in accordance with the policies and procedures prescribed by the Chief of Engineers in ER 1105-2-50. The study is in response to a request dated 29 October 1979 from the Governor of Guam for emergency federal assistance in protecting the shoreline and Highway 4 from erosion damage.

2.02 Public Concerns. The area is subjected to severe wave attack during storms and typhoons which periodically ravage the island. The highway, a major transportation link through the area, has suffered repeated damage, and the Government of Guam has had only limited success in protecting the highway from erosion damage. The most recent repair was completed as a result of Typhoon Tip which struck the island in October 1979. However, continuing erosion is threatening the integrity of the highway. The Government of Guam desires that emergency shore protection be constructed to protect the highway and shoreline against erosion damage. The Government of Guam's attempts to halt the erosion by dumping rocks have had only limited success.

2.03 Planning Objectives. Based on an analysis of the social, economic, and environmental aspects of the project area, and the identification of project problems and needs, the following objectives were determined to aid in the formulation and evaluation of alternative plans of improvement:

- a. Protect the shoreline and Highway 4 from damage by shoreline erosion.
- b. Minimize destruction of or adverse impacts to the nearshore marine environment and coral reef.
- c. Avoid adversely affecting the culture or lifestyle in the project area.

3. ALTERNATIVE PLANS

3.01 Plans Eliminated from Further Study. Both structural and nonstructural solutions to meet the planning objectives were investigated. Nonstructural measures were essentially limited to shoreline setback or shoreline management. The structural measures considered included construction of a protective beach, shoreline revetment, a groin or groin system, and an offshore breakwater. From the full array of possible management measures, a preliminary analysis and screening was performed to eliminate measures which were technically not applicable to the conditions at Askiroga Bay, obviously too expensive or socially or environmentally unacceptable, or obviously unimplementable alternatives. All measures except the shoreline revetment were eliminated from further study for the following reasons:

a. Shoreline Setback or Shoreline Management: Erosion is expected to continue in the future, and a nonstructural shoreline management plan would result in continued damage to Highway 4. Relocation of the highway is not feasible since it is situated adjacent to mountainous cliffs.

b. Protective Beach: This plan involves the construction of a beach to protect the backshore area from erosion by dissipating wave energy impinging on the shoreline. The continuing erosion problem and the exposure of the shoreline to storm waves renders the concept of a stable beach infeasible. Tropical storms and hurricanes which affect the project area usually subject the shoreline to high wave attack for several days; a beach would be subject to considerable erosion during storm periods. Continuing erosion of the beach would necessitate periodic nourishment. Because implementation of this plan would require a large amount of sand over the life of the project, the plan was not considered feasible. Accordingly, no further evaluation of the plan was made.

c. Groin: A groin is a shore protection structure designed to build a protective beach or to retard erosion of an existing or restored beach by trapping material in the nearshore zone. Groins are usually perpendicular to the shore and extend from a point landward of predicted shoreline recession into the water far enough to accomplish their purpose. Because of the lack of a significant longshore transport into the area, the groins would not function to trap material. Hence, a groin system is not considered a feasible shore protection alternative.

d. Offshore Breakwaters: Breakwaters are structures designed to protect coastal areas from wave action. They are usually constructed to intercept the movement of littoral material by dissipating the wave forces that would normally move it. In the same fashion, an offshore breakwater can provide shoreline protection by dissipating wave energy that would normally strike the shore and cause erosion. Offshore breakwaters may be built as low-profile structures, or to a height sufficient to prevent overtopping under design wave conditions,

depending on the degree of protection required. An offshore breakwater would alleviate wave damage to the existing highway and shoreline; however, because of the environmental and aesthetic impacts associated with construction on the reef flat, the use of offshore breakwaters was not considered a viable alternative.

3.02 Without Conditions. Without the Plan of Improvement, the shoreline and highway would continue to be susceptible to erosion damage. The no-action alternative does not meet any of the project planning objectives and was therefore eliminated from further study.

3.03 Plans Considered in Detail. Based on the preliminary screening and analysis, a revetment appears to be the only implementable measure for detailed consideration at Askiroga Bay.

A revetment is a facing of stone, concrete blocks, sandbags, or other materials, built to protect a scarp, embankment, or shore structure against erosion by wave action. Revetments can be permeable or nonpermeable depending on the choice of materials, and are a direct means of protecting the shoreline from continued erosion by separating the land from the ocean. The revetment appears to be an acceptable measure for consideration at Askiroga Bay since materials are readily available for its construction, it would minimize impact both on the highway and the reef area, it would provide the needed shore protection, and it is visually consistent with the pre-erosion setting.

It is planned to construct a 250-foot-long rubblemound revetment with a crest elevation of 14 feet above mean lower low water (MLLW). The structure would have a facing slope of 1V to 1.5H. The revetment would front the seaward side of Highway 4.

3.04 Comparative Impacts of Alternative Plans. The rubblemound revetment is the only implementable alternative plan (see Section 5 for a discussion of Environmental Consequences).

4. AFFECTED ENVIRONMENT

4.01 Environmental Conditions. The physical environment of the general area has been described in the Corps Reconnaissance Report of May 1980. Askiroga Bay is located on the southeastern shore of the island of Guam, just north of Talofoto Bay. Route 4, a two-lane highway, is situated at the base of mountainous cliffs, directly adjacent the shoreline. This scenic highway is the main throughfare serving the southeastern coast of the island. A US Fish and Wildlife Service site inspection provided the following information:

a. Fifty random casts of a 1/2-meter-square quadrat revealed that dominant organisms on the coarse sandy beach were hermit crabs (Paqurus guttatus), Cancellus sp., Aniculus sp.), and ghost crab (Ocypode sp.). Densities of ghost crab burrows and hermit crabs (three species) were found to be 0.40 and 1.28 per square meter, respectively.

b. Infaunal examination was limited to screening four samples of sand along the water's edge above the limestone strip. Samples were dug to the limestone layer three to four inches below the sand surface. The only organisms found were a single unidentified polychaete and two hemichordates, the densities of which were 3.50 and 7.00 per square meter, respectively.

c. A strip of Mariana Limestone Formation, probably Agana Argillaceous Member was exposed along the water's edge. This substrate was irregularly pocketed with small holes which frequently formed interconnecting tunnel systems. Within these tunnels were found a variety of organisms including snails, crabs, and gobies. As a result, samples of epifaunal organisms are highly inaccurate and do not represent true densities of organisms in this habitat type. Accurate sampling required destruction of the limestone, served no purpose, and was not conducted. Thirty random casts of the quadrat revealed a density of 8.8 organisms per square meter, comprised of mussels (Brachidontes sp. - $0.67/m^2$), hermit crabs - $5.6/m^2$, grapsid crabs - $0.53/m^2$, and snails (Mitra litterata, Strombus sp., Merita plicata, and Pythia scarabæus $1.73/m^2$), clams (Tellina sp - $0.13/m^2$), and xanthid crabs ($0.13/m^2$).

d. During a search of the boulders along the southwest margin of the bay, only grapsid crabs were seen, but not sampled quantitatively.

e. At the time of the Service investigation, there was a line of drift debris along the shore. This material was composed primarily of palm fronds and fruits, and pieces of bamboo culms. Within the debris were abundant populations of amphipods.

f. Terrestrial resources in the project site (i.e., east of the road) are limited. Vegetation at the northend of the bay consists of mixed trees and shrubby plants. Birds actually seen in the area were limited to one black drongo (Dicrurus macrocercus harterti, (S. Baker) and two reef herons (Egretta sacra sacra (Gmelin) which flew past. Charadriiformes probably feed along the shoreline; however, the area is not significant bird habitat for stilts.

g. Askiroga Cave, which is listed on the National Register of Historic Places, is located about 1,600 feet west of the project area. Asanite Cave site and Asanite Bay site complex are located about 600 feet northwest of the project according to available maps. These two sites are not listed on either the Guam or National Registers. While the project site is not located in a flood plain, it is located within a potential tsunami and high wave flood hazard area. The project site is exposed to erosion by large ocean swells and by typhoons.

h. The project area is not a municipal water supply source area and the groundwater in the area is most likely saline.

4.02 Highway 4 is the only significant resource within the project area. The public considers the highway to be a significant resource that is important to the community's well-being.

ENVIRONMENTAL CONSEQUENCES

5.01 The only significant consequence of the project would be the protection of Highway 4 from damage by shoreline erosion.

5.02 The project would not affect any wildlife refuges, marine sanctuaries, wetland, unique terrestrial or reef flat environments, unique or prime agricultural lands, archaeological/historical sites, groundwater, commercial fisheries, or floodplains, since none exist at the project site. Due to the nature of existing resources, probably caused in part by erosion at the site, and the limited effect of the proposed Corps' project thereon, the US Fish and Wildlife Service does not expect any significant resource losses due to project construction or maintenance. No endangered species will be affected at the site of the revetment. In fact, the Service believes that the revetment will provide a stable rocky intertidal habitat resulting in an increase in epifaunal populations.

5.03 No human residences will be relocated or displaced. The project protects the highway and does not provide any amenities that would change the social, structure, cohesion, or social well-being of the community.

5.04 The project does not require modifying existing land use plans. The area is zoned for transportation use and the project does not change this land use.

5.05 The Corps has determined that the project would not adversely affect any known cultural or historic sites including those listed on the National Register of Historic Places. The Corps is coordinating this determination with the Advisory Council on Historic Preservation.

5.06 The revetment will add a new man-made visual element along the shoreline and will probably provide a better aesthetic appearance than the existing eroded shoreline.

5.07 Construction equipment will generate temporary noise and hydrocarbon. Mitigative measures should include the use of mufflers and emission control devices on all motorized construction equipment. During construction, the project will have short term impact on the existing traffic flow along Route 4.

5.08 The materials utilized for construction of the revetment will not result in the discharge of toxic pollutants or excess turbidity. The Section 404 evaluation shows that no major effect on water quality is anticipated from dredging or filling operations of the project. The contractor will be required to maintain water quality within Government of Guam water quality standards during construction of the project.

6. LIST OF PREPARERS. The persons listed below were primarily responsible for the preparation of this Environmental Assessment.

<u>Name</u>	<u>Expertise</u>	<u>Experience</u>	<u>Professional Discipline</u>
Arthur G. Cropper	Geologist	BA, MS in Geology; 10 years in marine geology; 3 years EIS studies, Honolulu District.	Physical Environment Specialist
Elaine Tamaye	Coastal Engineering	BS, MS in Ocean Engineering; 2 years Honolulu District.	Hydraulic Engineer
David G. Sox	Historical & Cultural Geography	BA, MA Geography; 6 years research; 4 years EIS studies Honolulu District.	Social Environmental Specialist

7. PUBLIC INVOLVEMENT

7.01 Public Involvement Program. The Corps has coordinated with representatives of the Department of Public Works of the Government of Guam, the sponsor of the project. Prior to the construction, the Corps will issue a public notice of this action, its authority, and the emergency plan of improvement, as part of the required coordination described in para 7.02. There is no specific requirement under Section 14 to hold a public meeting.

7.02 Required Coordination. Pursuant to the Clean Water Act of 1977, as amended, an evaluation of dredge or fill material effects has been made using the Section 404 guidelines and the fill material and site have been found to be acceptable. A public notice offering opportunity for a public hearing will be issued.

A terrestrial and marine environment survey has been completed by the US Fish and Wildlife Service and a 2(b) report submitted. Coordination with the US Fish and Wildlife Service for threatened and endangered species has been completed. Water quality certification and historic/archeologic resources were coordinated with the Government of Guam.

A consistency determination, prepared in accordance with the Federal CZM Act of 1972, indicates that the proposed project is consistent with the approved local CZM program.

In compliance with Executive Order 11988 on Floodplain Management, an evaluation of the proposed project has been made using the Water Resources Council Floodplain Management Guidelines. The evaluation identifies minimal impacts associated with construction in the floodplain. A public notice will be issued to advise the general public in the affected area and to obtain their comments.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
ASKIROGA BAY SHORE PROTECTION, TERRITORY OF GUAM
29 April 1980

1. DESCRIPTION OF THE PROPOSED ACTION. The project is located on the southeastern coast of Guam, MI. The proposed plan of improvement consists of approximately 250 feet of rock revetment with a crest elevation of 14 feet above mean lower low water (MLLW) approximately at existing ground level. Two layers of armor stone (2,000 to 4,000-lb rock) will be placed on top of a three-foot thick underlayer of 1/4-inch spalls to 400-pound stone. The new structure will have a facing slope of 1V to 1.5H; the revetment will extend laterally a distance of approximately 30 feet on to the reef flat from the shoreline to the toe of the sea wall. Excavation and removal of some sediment and debris material to a depth of -7 feet MLLW or to coral reef will be necessary to insure a stable foundation for placement of the structure. Trucks, crane, front-end loader and other heavy equipment will be utilized to haul rock, fill, and equipment at appropriate times during construction. The project will protect the shoreline, and Highway 4 from wave damage during hurricanes and severe storms.

2. BASIS FOR FINDING. The following factors have been considered in the environmental assessment in making a determination that an environmental impact statement (EIS) is not required:

a. The suitability of the discharge site for the Askiroga Bay Shore Protection project has been determined through the application of the Section 404(b) guidelines. The project site is not a wetland, municipal water supply area, harvestable shellfish area, fishery, a fish spawning, a nursery area, or a wildlife habitat, a formal recreational area, or a habitat for threatened or endangered species.

The material used to construct the revetment meets the exclusion criteria promulgated by the US Environmental Protection Agency and is therefore exempt from chemical, elutriate, bioassay and total sediment analysis. All the material to be discharged is composed of rock greater than spall (gravel) size. The discharged material is not suspected of containing polluted materials.

b. Applicable Federal laws, (Reservoir Salvage Act of 1960; as amended, and National Historic Preservation Act of 1966 and regulations 36 CFR 305 and 36 CFR 800) have been applied. There are no historic sites or cultural resources at the project site that are listed on the National Register of Historic Places. The Corps has determined that the project would not adversely affect any cultural sites and is coordinating this determination with the Advisory Council on Historic Preservation.

c. There are no terrestrial species in Guam that are listed as endangered or threatened pursuant to the Endangered Species Act of 1973. Marine species protected by this act that could occur in Guam include the hawksbill turtle

(endangered) and the green turtle (threatened). Both species are reported as infrequent visitors to nearshore waters of Guam, but nesting has been reported as sporadic on the island. A field survey by the US Fish and Wildlife Service biologists found no evidence of these species in the project area.

d. Under the Fish and Wildlife Coordination Act of 1958, Section 2(b), the Corps and the FWS have determined that there are no significant fishery resources, no fish spawning or nursery areas, and no commercial harvestable shellfish beds in or adjacent to the project area. No marine sanctuaries or national wildlife refuges, or wetlands will be affected by the project.

e. No ocean dumping is required for the project; therefore implementation of Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act of 1972 is not required.

f. Pursuant to the Clean Air Act Amendments of 1977, the project will not result in a new, long-term air pollution source.

g. Pursuant to the Safe Drinking Water Act of 1974, the project will not affect drinking water in any manner since it is located in marine waters.

h. Pursuant to the Noise Control Act of 1972, construction generated noise in the project area will be minor and temporary and may be mitigated by the use of mufflers on motorized construction equipment. The project will not result in a new, long-term noise pollution source.

i. No human residences will be relocated or displaced. The project protects the highway and does not provide for any amenities that would change the social structure, cohesion or social well-being of the community.

j. Informal meetings with local officials by the Corps have not elicited negative comments or any controversial issues regarding the proposed project.

Based upon the above factors, the US Army Corps of Engineers finds that the Askiroga Bay Shore Protection Project has no significant impact on the human environment at Askiroga Bay, Guam.


B. R. SCHLAPAK
COL, Corps of Engineers
District Engineer