March 29, 1995

Mr. Gary Gill, Director
Office of Environmental Quality
Control (OEQC)
220 S. King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Re: Negative Declaration to Retain a Rock Wall at the
Napili Sunset Condominium, TMK: 4-3-2:54, Napili,
Lahaina, Maui

The County has reviewed the comments received during the 30-
day public comment period which began on April 23, 1994. The
agency has determined that this project will not have a
significant environmental effect and has issued a negative
declaration. Please publish this notice in the April 8, 1995
OEQC Bulletin.

We have enclosed a completed OEQC Publication Form and four
(4) copies of the final EA.

Should you have any questions, please contact Mr. Daren
Suzuki of my staff at 243-7735.

Yours truly,

[Signature]
BRIAN MISKA
Planning Director

DS
Enclosures
xc: Martin Luna, Esq.
Daren Suzuki
file
BEFORE THE MAUI PLANNING COMMISSION
COUNTY OF MAUI
STATE OF HAWAII

In the matter of the Request of
B. MARTIN LUNA, Esq., on behalf
of the Napili Sunset Condominium
Association

for an Environmental Assessment (EA)
review pursuant to HRS Chapter 343,
in order to retain a rock wall located
along the makai frontage of the Napili
Sunset Condominium, TMK: 4-3-2:54,
Lahaina, Maui, Hawaii.

Docket #94/EA-001
Mr. B. Martin Luna
(ds)

Maui Planning Department's Report
for the
Maui Planning Commission Meeting on
March 28, 1995

Environmental Assessment (EA) Review

Maui Planning Department
County of Maui
250 S. High Street
Wailuku, Maui, HI 96793
BEFORE THE MAUI PLANNING COMMISSION
COUNTY OF MAUI
STATE OF HAWAII

In the matter of the Request of

B. MARTIN LUNA, Esq., on behalf of the Napili Sunset Condominium Association

for an Environmental Assessment (EA) review pursuant to HRS Chapter 343, in order to retain a rock wall located along the makai frontage of the Napili Sunset Condominium, TMK: 4-3-2:54, Lahaina, Maui, Hawaii.

Docket #94/EA-001
Mr. B. Martin Luna (ds)

APPROVING AGENCY

Maui Planning Commission
County of Maui
250 S. High Street
Wailuku, Maui, Hawaii 96793

Contact Person: Daren Suzuki (808) 243-7735

THE APPLICANT

Napili Sunset Condominium Association
c/o One Main Plaza
Suite 400, 2200 Main Street
P.O. Box 1086
Wailuku, Maui, Hawaii 96793-1086

Contact Person: B. Martin Luna, Esq., on behalf of the applicant (808) 242-4535

THE REQUEST

1. This matter arises from a request for an Environmental Assessment ("EA") Review filed on December 16, 1993 pursuant to Chapter 343, Hawaii Revised Statutes; and Chapter 200, Environmental Impact Statement ("EIS") Rules of the Department of Health, State of Hawaii; by B. Martin Luna, Esq., on behalf of the Napili Sunset Condominium Association ("applicant"), on approximately 21,325 square feet of land, Napili, Lahaina, Island of and County of Maui, identified as Maui Tax Map Key No.: 4-3-2:54 ("property").
2. The applicant is requesting for an EA review to retain a rock wall of approximately 110 linear feet constructed along the makai boundary of the subject property.

APPlicable Regulations

1. Chapter 343, Hawaii Revised Statutes, establishes certain classes of action which subjects an applicant to an EIS requirement, provided that approval of an agency will be required and that the agency finds that the proposed action may have significant environmental effects. The applicable geographical category is, "...(3) Any use within the shoreline area as defined in Section 205A-41 HRS..."

2. Standards for reviewing an EIS Assessment are found in the Hawaii Administrative Rules, Title 11, Department of Health, Chapter 200 Environmental Impact Statement Rules, Subchapter 6, Determination of Significance, SS 11-200-12 Significance Criteria.

3. In determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short and long-term effects of the action. In most instances, an action shall be determined to have a significant effect on the environment if it:

"(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;

(2) Curtails the range of beneficial uses of the environment;

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes, and any revisions thereof and amendments thereto, court decision or executive orders;

(4) Substantially affects the economic or social welfare of the community or State;

(5) Substantially affects public health;

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

(7) Involves a substantial degradation of environmental quality;

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;"
(9) Substantially affects a rare, threatened or endangered species, or its habitat;

(10) Detrimentally affects air or water quality or ambient noise levels; or

(11) Affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters."

PROPERTY DESCRIPTION

1. The property is located at 46 Hui Drive, Napili, Lahaina, Maui, and is developed with a resort condominium project (exhibits 1 & 2).

2. The beach fronting the Napili Sunset is crescent shaped, extending across the head of the bay and bounded on either end by rock headlands. The beach primarily consists of calcareous sand. The bottom of the bay is predominantly sand although a narrow reef bisects the bay (exhibit 3).

3. The mouth of the bay faces west and is not directly exposed to North Pacific swell or trade wind waves, (typically the highest wave conditions other than hurricanes encountered in Hawaii). Both north and south swell can refract into Napili Bay from the channels between Maui, Molokai, and Lanai. Because of the shallow depth of the bay, large waves typically break offshore; smaller waves break on the narrow reef bisecting the bay. Tidal range at Napili Bay is 2.2 feet. Mean sea level is 1.0 feet above mean lower low water. Circulation within the bay depends on waves and tides. Offshore currents have been observed flowing to the south.

4. Surrounding Uses --
   a. North -- Hale Napili Apartments
   b. East -- Hui Drive
   c. South -- County Beach Access, Napili Sunset, and Napili Bay Condominium
   d. West -- Beach

5. Land Use Designations --
   a. State Land Use -- Urban
   b. Lahaina Community Plan -- Multi Family
   c. County Zoning -- Napili Bay Civic Improvement District
   d. Special Management Area ("SMA")
EXISTING SERVICES

1. Water -- The property is serviced by an existing 1-1/2" waterline along Hui Drive. Existing fire hydrants are located immediately across Hui Drive from the subject property. A 1.0 million gallon reservoir located on the mauka side of Honoapiilani Highway provides storage and feeds the distribution system in the area.

2. Sewer -- The property is serviced by an existing 4" sewer line running along Hui Drive. The County's wastewater collection and transmission system and the Lahaina Wastewater Reclamation Facility accommodate the region's wastewater needs.

3. Roadways -- Access to the subject property is via Hui Drive which is located just off of Lower Honoapiilani Road.

4. Drainage -- Drainage sheet flows mauka to makai off of the subject property. The improved beach access pathway adjacent to the property acts as a de facto drainageway for runoff from mauka areas.

5. Electrical and Telephone Service -- Electrical and telephone service to the West Maui region is provided by Maui Electric Company and GTE Hawaiian Telephone Company, respectively.

6. Police and Fire Protection -- Police protection is provided by the Lahaina Police Station located at the Lahaina Civic Center. The Napili area is equipped with a fire station located approximately 0.5 mile from the project site off of Napilihau Street.

7. Medical Facilities -- The major hospital facility on the Island is Maui Memorial Hospital, located approximately 25 miles from Lahaina, midway between Wailuku and Kahului. In addition, regular hours are offered by the Maui Medical Group, Lahaina Physicians, West Maui Healthcare Center, and Kaiser Permanente Medical Care Program.

8. Recreational Facilities -- The property is situated on Napili Bay with a county pedestrian beach access adjacent to the southern boundary of the property. West Maui is served by various other recreational facilities offering diverse opportunities for the region's residents.

10. Solid Waste -- Solid wastes generated in the Lahaina region are transported to the Central Maui Landfill located near Puunene.

BACKGROUND INFORMATION

1. On December 20, 1994, approximately 90 feet of shoreline protection was authorized by the Planning Department and the U.S. Corps of Engineers.

2. In February 1995, high waves caused severe erosion to the beach fronting the Napili Sunset Condominium on Napili Bay, Maui. Portions of the lawn were lost, beach stairways damaged, and trees threatened. Wave action left a sharp vertical embankment approximately 5 feet high between the lawn and beach. Because of the damage and continued threat to the property, Napili Sunset was granted an SMA Emergency Permit to protect the property with rocks placed along the embankment (exhibit 4).

3. Condition #5 of said permit stated that, "all boulders shall be removed within six (6) months from the date of the granting of this permit or by August 9, 1993, unless a Shoreline Setback Variance and Special Management Area Use Permit is obtained."

4. On July 29, 1993, the Planning Department received an application for an SMA Use Permit, Shoreline Setback Variance ("SSV") and EA Review to retain the temporary rock wall permitted through the SMA Emergency Permit as a permanent shoreline protection solution.

5. On October 8, 1993, the Planning Department amended the July 29, 1993 SMA Emergency Permit (exhibit 5). A final report on beach erosion shall be submitted concurrently with complete applications for an SMA Use Permit, SSV, and EA Review.

6. On December 16, 1993, a final report, "EVALUATION OF BEACH EROSION NAPILI BAY, MAUI (December 10, 1993)" and complete applications for said shoreline permits were received by the Planning Department.

7. On April 23, 1994, the draft EA was published in the Office of Environmental Quality Control Bulletin in anticipation of a negative declaration determination for the project.

LITTORAL DYNAMICS OF NAPILI BAY

1. The littoral dynamics of Napili Beach were evaluated through several means including analysis of aerial photos, measurement of beach slopes and nearshore bathymetry, analysis of data from offshore wave buoys, personal observations, and discussions with residents.
2. Based on aerial photographs, survey maps, and resident’s accounts, Napili Beach has receded shoreward over many years. Napili Sunset’s resident manager observed that the beach and lawn of Napili Sunset were the same elevation in 1980. The beach is now approximately 5 feet below the elevation of the lawn. Aerial photos of the beach from 1988, 1992 and 1993 were digitized and superimposed to show the position of the waterline and beach shape. The results show that the beach was wider in 1988. The figure also confirms visual observations that sand accumulates on the north end of the beach in summer and moves back toward the south in winter. The beach shape appears to oscillate around a node at the center of the beach near Napili Sunset. The position of this node probably varies from year to year and affects the width of the beach fronting Napili Sunset. The aerial photographs also show a crescent shaped reef across the bay parallel to the beach. This reef may mark the position of a former shoreline. If so, it is further indication that the shoreline has been receding over time.

3. Beach slopes are approximately 1:6 to 1:7, which is within the expected range for Hawaiian beaches. Beach slopes depend on wave conditions and are typically steeper in winter than summer. Median sand grain size is 0.5 mm in the wave swash zone, typical for Hawaiian beaches. Sand size at the top of the beach is smaller than in the swash zone indicating onshore transport has occurred.

4. Aerial photographs and personal inspection showed that the bottom of Napili Bay is largely covered by sand. The bay and nearby offshore area serve as a source of sand for the beach. On-shore/off-shore transport as well as the long-shore transport discussed above are responsible for the size and shape of the beach. Long-term beach erosion is an indication that sand in the bay may have been lost offshore where waves cannot bring it back to the beach, or that insufficient sand is being produced by the reefs to replace sand moved out of the bay.

5. Beaches that have not been changed by man’s development generally have sand berms or dunes in the backshore area just inland of the wave-washed beach. The berm provides natural shore protection and a source of sand that is important in beach dynamics during high wave or storm conditions. During some wave conditions sand is deposited by waves and berm grows. During other condition the berm erodes.

6. At Napili Bay, as in many other locations, the dune area contains beachfront buildings, and the dunes have been flattened or removed. Therefore, the natural coastal protection afforded by dunes does not exist, and high waves can threaten beachfront property.
PROJECT DESCRIPTION

1. The applicant would like to retain a rock wall which was constructed in February of 1993 along the makai boundary of the Napili Sunset property. This wall was constructed as an addition to an existing 90 feet long rock wall which had been constructed in early 1992 pursuant to approvals received from the Department of the Army and the County of Maui Planning Department. The portion of the wall which is the subject of this request extends approximately 110 linear feet along the makai boundary of Parcel 54, immediately north of an existing stairway leading from the subject property to the beach. The height of the wall varies from between approximately three feet (3') and five (5') in height.

2. According to the Evaluation of Beach Erosion Napili Bay, Maui, December 10, 1990, prepared for the applicant, the rock shore stabilization at Napili Sunset is not hit by waves except under high wave conditions. Therefore, it has minimal impact on transport of beach sand. For beach sand to be transported either longshore or on-shore/off-shore, it must be put in suspension by waves and moved by currents. A seawall with its base in water contributes to erosion by reflecting waves and adding the reflected energy to suspend sand particles. The rock structure at Napili Sunset does not reflect waves under normal conditions.

3. The wave heights that occurred during February 4-6, 1993, have a statistical return period of less than five years or a probability greater than 20% of occurring each year (Coastal Engineering Research Center, 1986). Waves of similar height can be expected to reach the lawn of Napili Sunset in the future.

SUMMARY OF AGENCY COMMENTS AND APPLICANT RESPONSE

1. Department of Land and Natural Resources, Division of Land Management -- Any proposed additions or maintenance work on the rock wall shall not extend seaward of the certified shoreline (exhibit 6).

Response: The entire rock wall is located mauka of the certified shoreline survey dated August 24, 1993.

2. Department of Land and Natural Resources, Division of Aquatic Resources -- no significant adverse impact to aquatic resources is expected from the existing boulders provided that they present no hazard for fishers or restrict, impede or inhibit the public's access to and along the shoreline (exhibit 6).
Response: The applicant states that the rock wall has not interfered with existing recreational and waterline activities insofar as it has had only minimal impact on transport of beach sand.

3. Department of Land and Natural Resources, Division of Boating and Ocean Recreation -- no objection provided that the rock wall extension was built with the same slope as the originally approved structure (exhibit 6).

Response: The subject rock wall was constructed in the same manner as the prior approved rock wall.

4. Department of Land and Natural Resources, Historic Preservation Division -- This project has "no effect" on known historic sites (exhibit 7).

5. Department of the Army -- a DA permit was issued for the subject project (exhibit 8).

6. Natural Resources Conservation Service -- no comments (exhibit 9).

7. Office of State Planning -- Concerned about shoreline protection on State property. No design information is provided regarding the slope, the structural integrity, or the size, weight, compositions, and stability components of the wall. Concerned that an unengineered seawall built under emergency conditions may not be suitable or appropriate as a permanent structure in the dynamic beach environment (exhibit 10).

Response: The applicant, through Oceanit Coastal Corporation, Coastal Engineering Services, provided additional information to the Office of State Planning. Oceanit emphasized that the rock wall should be replaced by a rubble revetment if it is damaged beyond repair. In its present configuration, they believe that the wall poses minimal erosion risk to the beach or adjacent properties.

8. Department of Planning -- In order to insure the structural integrity of the rock wall, as-built plans stamped by a licensed engineer shall be submitted. Further, plans should also be submitted for the termini endings on the northern end of the wall.

Response: As-built plans certified by the licensed contractor, and stamped by a registered professional engineer were submitted in accordance to Planning Departments request. Through conversation with the Department of Public Works and Waste Management, these plans would suffice in granting an after-the-fact building permit.
9. Department of Accounting and General Services, Survey Division -- no objections (exhibit 11).

10. Department of Public Works and Waste Management -- no objections to maintain the stone protection but recommend that if the existing and new constructed wall are damaged by future waves, then a new designed wall be constructed that will not impact adjacent properties during high wave action. The development is also required to conform to Chapter 19.62 pertaining to flood hazard districts. Any unstable or fallen boulders should be removed or reset (exhibit 12).

Response: The applicant would be required to conform to Chapter 19.62 as part of building permit requirements. In this case, building permit would be after-the-fact.

11. Office of Environmental Quality Control ("OEQC") -- Concerned on the technical details of the wall construction. Present discussion of alternatives, including modification of the structure to minimize beach scouring (exhibit 13).

Response: The Planning Department transmitted the Evaluation of Beach Erosion Report (12/10/93) to OEQC in response to their letter and to supplement the draft EA. The Planning Department received no additional correspondence from OEQC on this Report.

12. University of Hawaii at Manoa, Environmental Center -- The draft EA adequately addresses potential impacts of the rock wall. Recognition that seawalls may create sand migration that is detrimental to beach maintenance is important. Our reviewers emphasize that the applicant should avoid future actions which might aggravate further beach loss. Such actions would include grouting of the sea wall or trying to increase its slope. Future modifications, if necessary, should be encouraged in favor of extending the slope of the structure to minimize wave reflection and toe turbulence. In addition, the option of beach nourishment should be further considered (exhibit 14).

ALTERNATIVES TO THE PROPOSED USE

1. There appear to be two possible alternatives to maintaining the existing rock stabilization at Napili Sunset - revetments or sand nourishment. Should the rock stabilization be damaged beyond repair, it could be reconstructed as a properly designed rubble revetment with a 1:2 slope. A rubble revetment dissipates wave energy and has minimal potential to cause beach erosion. However, a revetment requires more area than the present structure.
2. A possible long term solution to erosion at Napili Beach is sand nourishment. Nourishment would mean obtaining sand from offshore sources and placing it on the beach, essentially moving the shoreline seaward. Nourishment is beyond the economic means of individual beachfront property owners and would require federal, state, and county cooperation for planning, funding, and execution.

3. Maintaining the existing rock stabilization structure is a viable method of erosion control. The structure has prevented further erosion since the February 1993 storm. The rocks have minimal affect on littoral transport. Without the rocks, the lawn would be damaged, the vegetation line would move closer to the buildings, and trees would be lost. Wave runup during high wave conditions could reach the bottom floor apartments.

4. The recommended mitigation for the rock stabilization is to maintain healthy vegetation on and shoreward of the rocks to stabilize soil and soften the appearance. Salt tolerant plants are required such as the morning glory and naupaka now growing at the site. In addition, if rocks are displaced from the structure, they would be replaced. Gaps in the structure can cause accelerated erosion.

ANALYSIS

Pursuant to Chapter 200 of the Department of Health Rules and Regulations, the following criteria have been established in order to determine where an action will have a significant affect on the environment. In most instances, an action shall be determined to have a significant effect on the environment if it:

"1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

As mentioned earlier, the Beach Erosion Report states that because the rock shore stabilization at Napili Sunset is not hit by waves except under high wave conditions, it has minimal impact on transport of beach sand and impact on beach erosion. As such, private property will be protected from the effects of shoreline erosion while having minimal adverse impacts to natural coastal processes.

Further, the proximity of the rock wall has not interfered with existing recreational, and waterline activities insofar as it has had only minimal impact on transport of beach sand. The selected alternative should result in little, if any, loss of existing public beach area.
Concerns relative to the structural integrity of the wall and its impacts to the on-shore/off-shore and long-shore sand transport, and to beach erosion under normal wave conditions have been adequately addressed by the applicant.

However, it should be noted that over the years, the Napili Bay shoreline has been eroding (Evaluation of Beach Erosion Napili Bay, Maui 1993). This wall has a 1:1 slope and was not designed to dissipate wave energy and promote sand accumulation. Should the trend of shoreline erosion continue in years to come, the present abnormal storm wave conditions (occurring with a probability of greater than 20% a year) would probably increase. This increase occurrence could possibly cause long-term impacts to the immediate shoreline, as well as surrounding properties.

Further, the wall is of single boulder thickness, has no filter cloth, and has no grout. Repeated wave impact to the wall under abnormal conditions could result in erosion and washout occurring immediately mauka of the boulders. Therefore, the structure could ultimately collapse. These concerns have not been addressed by the applicant.

In analyzing the above, the shoreline structure should be reviewed as a temporary solution to shoreline erosion under present normal conditions. Careful monitoring by the Department, as well as the applicant should occur to insure long-term impacts do not occur. All repair and maintenance activities should be reviewed by the department, and should the wall be damaged beyond repair, it should be replaced by a properly designed revetment structure which is designed to dissipate wave energy, promote sand accumulation, and prevent washout from occurring on private property. These mitigative concerns may be implemented during the SMA and SSV review.

As mentioned earlier, Historic Preservation Division stated that the project has "no effect" on significant historic sites.

2) Curtails the range of beneficial uses of the environment

The action would not significantly impede existing access to and along the shoreline provided mitigative measures are incorporated as part of the SMA and SSV review. Thus, the action would not curtail public use of the area.

3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes, and any revisions thereof and amendments thereto, court decision or executive orders;
The purpose of this chapter is to establish a state policy which will encourage productive and enjoyable harmony between man and his environment, promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaii.

The action would not conflict with Chapter 344, HRS. The revetment will temporarily help protect private property from shoreline erosion, and under present normal conditions, would have minimal adverse impacts to existing natural coastal processes. Further, selected alternative would result in little, if any, loss or destruction of public beach area. Potential long-term impacts to shoreline erosion may be mitigated through subsequent SMA and SSV review.

4) **Substantially affects the economic or social welfare of the community or State:**

The action is limited in scope and would have negligible social or economic affects to the community or state.

5) **Substantially affects public health:**

Inasmuch as the project is complete, there would be no construction related short-term impacts on public health.

6) **Involves substantial secondary impacts, such as population changes or effects on public facilities:**

Due to the limited and confined scope of the project, it would not result in substantial secondary impacts to population, existing public facilities, streets, drainage, sewage and water systems, and pedestrian walkways.

7) **Involves a substantial degradation of environmental quality:**

As mentioned earlier, construction is complete. As such, there will be no short-term construction impacts to environmental quality.

8) **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions:**
Shoreline protection structures have the potential to exacerbate erosion on adjacent properties, leading the neighboring property owner no choice but to construct a similar structure. Although the applicant states that under normal conditions, the wall will have minimal impacts on onshore/off-shore and long-shore sand transport, the structure is not properly designed to mitigate long-term shoreline erosion impacts. Therefore, this structure should be viewed as a temporary shoreline protection, and continuous detailed monitoring and documentation should be done to address any long-term impacts to the environment.

9) **Substantially affects a rare, threatened or endangered species, or its habitat:**

There are no known rare, threatened, or endangered species or its habitat within the project area.

10) **Detrimentally affects air or water quality or ambient noise levels:**

The rock stabilization structure will have little or no impact on water quality or the habitat of marine life. Water quality may actually be improved by preventing topsoil from washing into the bay. The structure has no impact on aquatic resources or ambient noise levels.

11) **Affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

Runoff drainage has been addressed by using the public access to the beach as a drainage path. This drainage has contributed to beach erosion in the past and further runoff control should possibly be considered; however, the rocks do not appear to substantially affect drainage. Portions of the beach are in the coastal flood zone. The structures have little impact on flood hazard, but will provide protection to Napili Sunset.

The applicant would be required to conform to the Flood Hazard District Ordinance of the Maui County Code.

The structure has minimal impact on recreational services/resources. Beach access or use are not impeded.

The action would not substantially affect other environmentally sensitive areas."
PUBLIC TESTIMONY

The Planning Department received one (1) letter from the Hale Napili Owners Association stating no opposition to the subject project. However, should damage of their property be attributed to the subject wall, they would consider the Napili Sunset liable (exhibit 15).

MITIGATION MEASURES

Appropriate mitigation measures to limit the impacts of the project on the environment have been proposed by the applicant and the department and which can be more specifically documented in greater detail during the subsequent Special Management Area Use Permit and Shoreline Setback Variance.

CONCLUSION OF LAW

In light of the foregoing, the rock stabilization structure at Napili Sunset presently has minimal impact on beach erosion. Without the rocks, the lawn and buildings will be threatened by wave damage under wave conditions that have a probability of happening every year. The rocks at Napili Sunset do not have a major effect on beach erosion at the neighboring property. The property as well as Napili Bay are being affected by long-term beach erosion aggravated by short-term storm wave conditions. The rock stabilization should be left in place; however, if it is damaged beyond repair, it should be replaced by a rubble revetment properly designed and constructed. The County Maui and State of Hawaii should consider a beach nourishment program for rebuilding eroding beaches with sand pumped from offshore sources.

It is hereby determined that with the incorporation of necessary mitigation measures the proposed project will not have a significant adverse impact on the environmental as defined by Chapter 343, Hawaii Revised Statutes, and the Environmental Impact Statement Rules of the Department of Health, State of Hawaii; and that an environmental impact statement is not required for the proposed project.
DETERMINATION

Pursuant to SS 11-200-11(C) of the Environmental Impact Statement Rules, the Planning Department's Report is hereby adopted as a Negative Declaration for the referenced project.

APPROVED:

[Signature]

BRIAN MISRAE,
Planning Director
Shoreline Verification
(For Shoreline Setback Purposes)

LOTS 9 & 10
NAPILI SUNSET

NAPILI 4 & 5, LAHAINA, MAUI, HAWAII

This work was prepared by me
or under my direct supervision.

[Signature]

July 6, 1991
Mr. Zaldy Ugalino  
Napili Sunset  
46 Hui Drive  
Lahaina, HI 96761  

Dear Mr. Ugalino:

Re: Special Management Area Emergency Permit to place temporary boulders along the shoreline of Napili Sunset, TMK: 4-3-2:53 & 54, Lahaina, Maui (93/SM3-003).

In response to your request received on February 4, 1993, a determination has been made in accordance with Article II, Special Management Area Rules and Regulations of the County of Maui, Section 2-12 Special Management Area Emergency Permit Procedures.

Subsection 1 of said section states in part that, "...in the event of an imminent and substantial harm to the public health, safety, or welfare, the Director may issue a Special Management Area Emergency Permit..."

Based on a site inspection and documentation provided with your request, there was evidence that the shoreline has eroded approximately 10 feet as a result of the high surf on February 3, 1993. The top of the bank was now approximately 20 feet from the structure, and some electrical lines were exposed. The News Release on February 4, 1993 stated that the next high tide, which will be higher than normal, will occur at about 1:15 a.m., Friday morning. Therefore, the highest surf could be expected at this time.

If no measures are taken to protect the property, the potential high surf could erode the shoreline an additional 10 feet, leaving the structure within approximately 10 feet from the top of the bank. It is hereby determined that if the shoreline were left unprotected, there may be imminent and substantial harm to public health, safety or welfare. Accordingly, Special Management Area Emergency Permit was granted on February 4, 1993, and subject to the following conditions:

1. That the placement of the boulders shall be limited to single boulder thickness.

2. That the boulders shall not exceed the level of the existing erosion line.

EXHIBIT 4
3. That the boulders shall not be placed seaward of the shoreline map dated July 6, 1992.

4. That within a period of three (3) months, the applicant shall submit applications for a Shoreline Setback Variance, an Environmental Assessment Determination, and a Special Management Area Use Permit.

5. That all boulders shall be removed within six (6) months from the date of the granting of this permit, or by August 9, 1993, unless a Shoreline Setback Variance and Special Management Area Use Permit is obtained.

6. That the applicant, its successors and permitted assigns shall exercise reasonable due care as to third parties with respect to all areas affected by subject Special Management Area Emergency Permit and shall hold the County of Maui harmless from and against any loss, liability, claim or demand arising out of this permit.

Thank you for your cooperation. If additional clarification is required, please contact this office.

Very truly yours,

[Signature]

Planning Director

xc: LUCA(5)
sma file
D. Suzuki
October 8, 1993

Mr. Richard Prochazka
Pumas Inc.
P.O. Box 1774
Lemon Grove, CA 91946

Dear Mr. Prochazka:

Re: Napili Sunset, TMK: 4-3-2:54, Lahaina, Maui.

This letter is in response to the Preliminary Evaluation of Beach Erosion report for the Napili Sunset prepared by Warren Bucher, Ph.D., Senior Ocean Engineer, Oceanit Coastal Corporation.

Based on this report, it does not appear that the temporary erosion control measure will cause irreparable damage to surrounding properties during the winter months. Therefore, we are hereby granting your request for a time extension to submit the Final report. Said report shall be filed with our department no later than December 18, 1993.

Further, conditions 4 & 5 of the Special Management Area Emergency Permit dated February 10, 1993 shall be amended to read as follows:

4. That a final report on beach erosion for the Napili Sunset shall be submitted no later that December 18, 1993.

5. That complete applications for an Environmental Assessment, Shoreline Setback Variance and Special Management Area Use Permit shall be filed prior to or concurrently with the final report.

Please be advised that appropriate legal action may be taken should these conditions not be complied with.

Although we have received these applications as stated in condition 5 on July 29, 1993, we are returning them because of the lack of nearly all the required submittals. Enclosed are additional copies of the application forms for your use (please refer to the required submittal check list attached to each application).

EXHIBIT 5
Mr. Prochazka  
October 8, 1993  
page 2

Pursuant to Article II Special Management Area Rules and Regulations of the County of Maui, Section 2.9.5(b), the Director shall require the applicant to obtain a Special Management Area Use Permit where it is determined that the proposed action ... may have a significant adverse environmental or ecological effect, taking into account potential cumulative effects. Inasmuch as shoreline areas are, "environmentally sensitive areas" and that the wall structure could have a significant adverse impact on littoral processes of the area, it is hereby determined that the proposed action may have a significant adverse environmental or ecological effect, taking into account potential cumulative effects. As such, a Special Management Area Use Permit shall be required.

Thank you for your cooperation. Should you have any questions, please contact Mr. Daren Suzuki of my staff at (808) 243-7735.

Very truly yours,

[Signature]

BRIAN MRSKE
Planning Director

encl.
xc: Hale Napili AGA
Zaldy Ugalino, Napili Sunset
Dr. Warren Bucher
The Honorable Brian W. Miskea, Director
Planning Department
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Dear Mr. Miskea:

Subject: Environmental Assessment (EA) for Shoreline Setback Variance (94/SSV-002) and Special Management Area Use (94/SM-001) Permit: Retention of a Shoreline Stabilization Structure at the Napili Sunset Condominium, Napili, Maui, THN: 4-3-02: 54

We have reviewed the EA information for the subject permits transmitted by your memorandum dated January 12, 1994, and have the following comments:

Brief description:

The applicants, the Napili Sunset Condominium Association, seek to retain shoreline protection boulders fronting approximately 110 feet of the subject property. This portion of the property’s existing shoreline protection was authorized by the County Planning Department via Emergency SVA Permit granted in early 1993. The other 90 feet of this shoreline protection was authorized by SVA, SSV and U.S. Corps of Engineer Permits granted in late 1991.

Division of Land Management

The Division of Land Management comments that a certified shoreline survey was approved on August 24, 1993 for the Napili Sunset Condominium. The certified shoreline has been determined to extend along the rock wall boundary. Any proposed additions or maintenance work on the rock wall shall not extend seaward (makai) of the certified shoreline.

Division of Aquatic Resources

The Division of Aquatic Resources comments that no significant adverse impact to aquatic resources is expected from the existing boulders provided that they present no hazard for fishers or restrict, impede or inhibit the public’s access to and along the adjacent beach.

EXHIBIT 6
Division of Boating and Ocean Recreation

The Division of Boating and Ocean Recreation comments that they have no objections provided that the rock wall extension was built with the same slope as the originally approved structure.

Our Historic Preservation Division concerns will be forwarded to you as they become available.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to contact Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

[Signature]

KEITH W. ABUE
February 15, 1994

Mr. Brian Miskae, Director
Maui Planning Department
250 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Miskae:

SUBJECT: County of Maui, Historic Preservation Review of the Environmental Assessment Determination, Shoreline Setback Variance and Special Management Area Use Permit to Retain a Rock Wall at the Napili Sunset Condominium, Napili 4 & 5, Lahaina

I.D. No.: 94/EA-001, 94/SML-001, 94/SSV-002

Thank you for an opportunity to review this project, which is concerned with an existing rock retaining wall that was constructed along the beach frontage at the Napili Sunset Condominium. According to the background documents, this project has already been completed.

There are no known historic sites in the vicinity of this project, which is located along an active shoreline sand dune. If buried (unknown) cultural deposits are present, the existing rock wall will serve to protect them from erosion.

This project has "no effect" on known historic sites.

Please contact Ms. Theresa Donham at 243-5169 if you have any questions.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

KD:jen

C: Roger Evans, OCEA
January 28, 1994

Planning Division

Mr. Daren Suzuki, Project Planner  
County of Maui  
250 South High Street  
Wailuku, Maui, Hawaii 96793

Dear Mr. Suzuki:

Thank you for the opportunity to review and comment on the Shoreline Setback Variance and Special Management Area Use Permit for the Napili Sunset Condominium Rock Wall, Maui (TMK 4-3-2: 54). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. A DA permit was issued for the subject project by our Operations Division. Please contact Ms. Karen Tomoyasu of Operations Division at 438-9258, extension 20 for further information and refer to file number NW92-018.

b. The flood hazard information provided on page 12 is correct.

Sincerely,

[Signature]

Kisuk Cheung, P.E.  
Director of Engineering

EXHIBIT 8
Mr. Brian Miskae, Planning Director  
Maui Planning Department  
250 S. High Street  
Wailuku, Hawaii 96793  

Dear Brian,  

RE: EA Determination, Shoreline Setback Variance and Special Management Area Use Permit to Retain a Rock Wall at the Napili Sunset Condominium; TMK: 4-3-2:54  
I.D. No. 94/EA-001, 94/SMI-001, 94/SSV-002  

I have no comments on the proposed subject.  

Sincerely,  

[Signature]  
Neal S. Fujiwara  
District Conservationist
February 14, 1994

The Honorable Brian A. Miskae
Planning Director
Planning Department
County of Maui
250 South High Street
Wailuku, Hawaii  96793

Dear Mr. Miskae:

In response to your transmittal of January 12, 1994 regarding the seawall at the Napili Sunset Condominium, we have the following comments.

The request for an environmental assessment (EA) is unusual and a bit confusing in that the statutory environmental review process does not include "applications" or "requests" for EAs. We understand that a Special Management Area (SMA) Use Permit and a Shoreline Setback Variance will be required to retain the existing seawall. Additional information is required and necessary before a thorough determination can be made regarding the wall's possible impacts on valuable coastal resources. For example, while we note the shoreline was certified in August, 1993 (after the wall was built) along the base of the wall, there is no information regarding the location of the shoreline prior to the construction of the wall, or whether it was built on private or public land. As you know, we are very concerned about shore protection structures being built on State-owned, public lands seaward of the shoreline. Also, no design information is provided regarding the slope, the structural integrity, or the size, weight, composition, and stability of the components of the wall. We have concerns that an unengineered seawall built under emergency conditions may not be suitable or appropriate as a permanent structure in the dynamic beach environment. The erosion report included with the application materials suggests that the wall could be reconstructed as a properly designed, sloped revetment. Information should be provided to credibly explore this option.

Additionally, the application fails to address the new CZM objectives and policies that were added to Chapter 205A, HRS after the 1993 Legislative session. The policies pertaining to beach protection have direct relevance to this project, and information should be provided to ensure that the project and its approvals comply with the objective and policies. Given its shortcomings, we recommend that further processing of this application be postponed until sufficient material is submitted to allow a thorough analysis.

Thank you for the opportunity to comment. If you have any questions, please contact Tom Eisen of our CZM Program at 587-2880.

Sincerely,

Harold S. Masumoto
Director

EXHIBIT 10
STATE OF HAWAII
DEPARTMENT OF ACCOUNTING
AND GENERAL SERVICES
SURVEY DIVISION
P. O. BOX 118
HONOLULU, HAWAII 96810


TRANSMITTAL

TO: Mr. Brian Misakae, Director

ATTN.: Mr. Daren Suzuki

SUBJECT: I.D. No.: 94/EA-001, 94/SML-001, 94/SSV-002
TMK: 4-3-2154
Project Name: Environmental Assessment Determination,
Shoreline Setback Variance and Special
Management Area Use Permit to Retain a
Rock Wall at the Napili Sunset Condominium

Applicant: B. Martin Luna, Esq.

REMARKS:
The subject proposal has been reviewed and confirmed that no
Government Survey Triangulation Stations and Benchmarks are
affected. Survey has no objections to the proposed project.

STANLEY S. HASEGAWA
Acting State Land Surveyor
MEMO TO: Brian W. Miskae, Planning Director
FROM: George N. Kaya, Public Works & Waste Management Director
SUBJECT: Environmental Assessment Determination, Shoreline Setback Variance and Special Management Area Use Permit Applications
NAPILI SUNSET CONDOMINIUM - ROCK WALL
TMK: 4-3-2:54
94/EA-001, 94/SMJ-001, 94/SSV-002

March 1, 1994

We reviewed the subject application and have the following comments:

1. Comments from the Engineering Division:
   a. We offer no objections to maintain the newly constructed revetment stone protection but recommend that if the existing and new constructed wall are damaged by future waves, then a new designed wall be constructed that will not impact adjacent properties during high wave action.

   The applicant is requested to contact the Engineering Division at 243-7745 for additional information.

2. Comments from the Wastewater Reclamation Division:
   This division has reviewed this submittal and has no comments at this time.

3. Comments from the Solid Waste Division:
   a. The owners and their contractors shall implement solid waste reduction, re-use and recycling programs to reduce the amount of solid waste to be disposed of at the County landfills.

   b. Refuse collection shall be by a private collector.
The applicant is requested to contact the Solid Waste Division at 243-7875 for additional information.

4. Comments from the Land Use and Codes Administration:
   a. The subject project is within an area (V23) of the 100 year coastal flooding with velocity (wave action) and with a base flood elevation at approximately 18 feet mean sea level, as such, the development is required to conform to Chapter 19.62 of the Maui County Code (1993) pertaining to flood hazard areas. An analysis should be provided with supporting calculations that the rock wall will not increase the potential flood damage to the subject and adjacent properties.
   b. Any unstable or fallen boulders should be removed or reset.

The applicant is requested to contact the Land Use and Codes Administration at 243-7373 for additional information.

RMN: ey
xc: L.U.C.A.
    Engineering Division
    Solid Waste Division
    Wastewater Reclamation Division

a: czmplanning
Mr. Brian W. Miskae  
County of Maui Planning Department  
250 S. High street  
Wailuku, Hawaii 96793

Attention: Daren Suzuki

Dear Mr. Miskae:

Subject: Draft Environmental Assessment for A Rock Wall at the Napili Sunset Condominium at Napili, Lahaina, Maui

We have reviewed the subject document and have the following comments:

1. Please provide site location maps for the subject property.

2. Describe the technical details of the wall construction. Was the wall engineered to reduce the impact of wave action on adjacent properties? If not, please present discussion of alternatives, including modification of the structure to minimize beach scouring.

3. The description of affected environment should include discussion of the condition of the shoreline in the vicinity of the subject seawall. To what extent is the coastline in this area hardened by other stabilization structures?

4. Describe the impact of the seawall on public access to the shoreline at the property site.

April 8, 1994
Mr. Brian M. Miskae  
Page 2  
April 8, 1994

5. Please consult with the Army Corps of Engineers, the State Department of Land and Natural Resources, and the Office of State Planning to determine if any permits are required, including a Shoreline Certification Survey.

6. Please contact other landowners in the vicinity of the project area and allow for consideration of their comments before approving the structure in its current design.

If you have any questions, please contact Betty Wood at 586-4185.

Very truly yours,

[Signature]

BRUCE S. ANDERSON, Ph.D.  
Interim Director

c: B. Martin Luna, Esq.
Mr. Daren Suzuki  
Maui Planning Commission  
250 South High Street  
Wailuku, Hawaii 96793  

Dear Mr. Suzuki:  

Draft Environmental Assessment  
Shoreline Setback Variance to Retain a Rock Wall  
Napili Sunset Condominium (TMK:4-3-2:54)  
Lahaina, Maui  

The Draft Environmental Assessment (EA) is an after-the-fact assessment for a rock wall constructed along the makai frontage of the Napili Sunset Condominium. The rock wall was legally constructed under emergency conditions during a severe storm in February of 1993.  

The draft EA was reviewed with the assistance of Jacquelin N. Miller and Chris Welch of the Environmental Center.  

The draft EA adequately addresses potential impacts of the rock wall. Recognition that seawalls may create sand migration that is detrimental to beach maintenance is important (Section IV of the included Evaluation of Beach Erosion at Napili Bay). Section III of the same evaluation notes that the entire beach fronting the Napili Sunset Condominium has receded shoreward over the years. Our reviewers emphasize that the applicant should avoid future actions which might aggravate further beach loss. Such actions would include the grouting of the sea wall or trying to increase its slope. Future modification, if necessary, should be encouraged in favor of extending the slope of the structure to minimize wave reflection and toe turbulence. In addition, the option of beach nourishment discussed in the appended consultant's report should be further considered.
Mr. Daren Suzuki  
June 6, 1994  
Page 2  

Affected Environment  

C. Impacts on Infrastructure and Services  

4. Drainage: the document states that drainage will not be affected by the wall. However, the Findings and Conclusion (section IX) state that water quality may actually improve due to erosion control of topsoil. This control of topsoil implies an effect on the drainage of the area.  

Impacts On Environment and Mitigation Measures  

B. Impacts to Community Setting  

1. Population and Local Economy: the statement that the rock wall will have no impact on population or local economy is inconsistent with the analysis presented in VIII E(6). That the wall was constructed for the purpose of reducing hazards to life and property is a positive impact on the community. Additionally, the erosion control referred to could have a positive impact on water quality, and thus on local and visitor satisfaction with the use of the bay.  

Thank you for the opportunity to comment on this Environmental Assessment.  

Sincerely,  

John T. Harrison  
Environmental Coordinator  

cc: OEOC  
B. Martin Luna, Esq.  
Roger Fujioka  
Jacquelin N. Miller  
Chris Welch
March 23, 1994

Ron Mitchell
Napili Sunset
46 Hui Drive
Unit 209
Lahaina, Maui, HI 96761

Dear Mr. Mitchell,

This is to inform you that the Hale Napili Owners Association will not oppose your variance for maintaining the rock sea wall in front of Napili Sunset. We do, however, remain concerned about the wall's effect on the beach fronting our property and should damage attributed to your wall result, we would consider you liable for said damages.

Hopefully the seas will remain calm.

Sincerely,

Ross D. Bright
President, Hale Napili Owners Assn.

cc: Maui County Planning Commission
EVALUATION OF BEACH EROSION
NAPILI BAY, MAUI

prepared for:
Napili Sunset Apartment Owners Association
and
County of Maui Planning Department

December 10, 1993

Oceanit Coastal Corporation
coastal engineering services
A subsidiary of Oceanit Laboratories, Inc.
EXECUTIVE SUMMARY

In February 1993, high waves caused severe erosion to the beach fronting the Napili Sunset Condominium on Napili Bay, Maui. Napili Sunset was granted a Special Management Area Emergency Permit to protect the property with a rock shore stabilization structure. An evaluation of the impacts of the structure to the shoreline is provided herein.

Napili Beach appears to have eroded over time. Recent aerial photos show beach recession since 1988. Erosion is probably long-term aggravated by storm events. The beach changes shape seasonally with more sand at the north end in summer. Beach slopes and sand grain sizes are typical for Hawaiian beaches. Napili Bay contains large amounts of sand spread over much of the bottom. On-shore/off-shore sand transport occurs between the bay and the beach.

The location of the property on Napili Bay shelters it from direct attack from typical winter waves; however, north swells can refract into the bay. During February 4-6, 1993, deepwater waves from the north with heights in excess of 20 feet were recorded by data buoys. Very high tides were recorded on the same days. Oceanit calculated wave runup over 13 feet from these waves, which would reach the embankment at the edge of Napili Sunset's lawn. Observations by residents and photos also verified the wave runup. Waves over 20 feet have a 20 percent probability of occurring annually.

The rock stabilization structure does not come into contact with waves except under high wave and tide conditions. Therefore, the rocks do not normally affect sediment transport on Napili Beach. The structure does not appear to have any other environmental impacts.

There are two possible alternatives to maintaining the existing rock shore stabilization. It could be replaced by a sloping rubble revetment; however, this is not recommended unless the existing structure is damaged beyond repair. A long-term alternative is to nourish the beach with sand, but beach nourishment would require county and state planning and funding. If the existing structure is removed, portions of Napili Sunset's lawn and trees will be threatened. In storm conditions, water could reach the building. It is recommended that the existing shore stabilization structure remain in place. However, it should be maintained and vegetation encouraged to grow on it and inshore of it to provide additional protection and a more natural appearance.
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Oceanit Coastal Corporation
I. INTRODUCTION

In February 1993, high waves caused severe erosion to the beach fronting the Napili Sunset Condominium on Napili Bay, Maui. Portions of the lawn were lost, beach stairways damaged, and trees threatened. Wave action left a sharp vertical embankment approximately 5 feet high between the lawn and beach. Because of the damage and continued threat to the property, Napili Sunset was granted a Special Management Area Emergency Permit by the County of Maui Planning Department to protect the property with rocks placed along the embankment. Subsequent to construction of the rock stabilization, the Planning Department requested an evaluation of impacts to the shoreline from the rocks. Oceanit Coastal Corporation was contracted by Napili Sunset to provide the evaluation. A report of our findings and assessment of beach processes at Napili Bay is included herein.
II. SITE AND ENVIRONMENT DESCRIPTION

Napili Sunset Condominium is located on the beach at Napili Bay on Maui (Figure 1). The beach is crescent shaped, extending across the head of the bay and bounded on either end by rocky headlands (Figure 2). The beach consists primarily of calcareous sand. The bottom of the bay is predominantly sand although a narrow reef bisects the bay. The bay is shallow with depths less than 10 feet for several hundred feet offshore. The mouth of the bay faces west and is not directly exposed to North Pacific swell or trade wind waves, typically the highest wave conditions other than hurricanes encountered in Hawaii. Both north and south swell can refract into Napili Bay from the channels between Maui, Molokai, and Lanai. Because of the shallow depth of the bay, large waves typically break offshore; smaller waves break on the narrow reef bisecting the bay. Tidal range at Napili Bay is 2.2 feet. Mean sea level is 1.0 feet above mean lower low water. Circulation within the bay depends on waves and tides. Offshore currents have been observed flowing to the south.

The Napili Sunset property and shoreline are shown in Figure 1. There is a lawn 30-40 feet wide between the buildings and the beach. The lawn is separated into two areas by a public beach access that also serves as a drainage path for rain runoff. The rock shoreline stabilization extends for approximately 35 feet south of the beach access and for approximately 177 feet along the northern section of the property. The rock stabilization extends approximately 5 feet above the existing beach level. The beach fronting the property is approximately 60 feet wide; however, dimensions vary with conditions. The property to the north of Napili Sunset, Hale Napili, is protected by a sandbag structure that follows approximately the same line as the rocks at Napili Sunset. The property to the south of Napili Sunset has no substantial shore protection and the beach extends to the building. Similarly, properties to the north of Hale Napili do not have shore protection.

2

Oceanit Coastal Corporation
FIGURE 1. NAPILI SUNSET PLOT PLAN AND LOCATION MAPS

NAPILI BAY, MAUI
III. EVALUATION OF NAPILI BEACH

The littoral dynamics of Napili Beach were evaluated through several means including analysis of aerial photos, measurement of beach slopes and nearshore bathymetry, analysis of data from offshore wave buoys, personal observations, and discussions with residents.

Based on aerial photographs, survey maps, and residents' accounts, Napili Beach has receded shoreward over many years. Napili Sunset's resident manager observed that the beach and lawn of Napili Sunset were the same elevation in 1980. The beach is now approximately 5 feet below the elevation of the lawn (Figure 3). Aerial photos of the beach from 1988, 1992, and 1993 were digitized and superimposed to show the position of the waterline and beach shape. The results, Figure 4, show that the beach was wider in 1988. The figure also confirms visual observations that sand accumulates on the north end of the beach in Summer and moves back toward the south in Winter. The beach shape appears to oscillate around a node at the center of the beach near Napili Sunset. The position of this node probably varies from year to year and affects the width of the beach fronting Napili Sunset. The aerial photographs also show a crescent shaped reef across the bay parallel to the beach. This reef may mark the position of a former shoreline. If so, it is further indication that the shoreline has been receding over time.

Beach profiles were measured at five locations shown in Figure 5. Beach slopes are approximately 1:6 to 1:7, which is within the expected range for Hawaiian beaches. Beach slopes depend on wave conditions and are typically steeper in winter than summer. Beach sand size gradation is shown in Figure 6. Median grain size is 0.5 mm in the wave swash zone, typical for Hawaiian beaches. Sand size at the top of the beach is smaller than in the swash zone indicating onshore transport has occurred.

Aerial photographs and personal inspection showed that the bottom of Napili Bay is largely covered by sand. The bay and nearby offshore area serve as a source of sand for the beach. On-shore/off-shore transport as well as the longshore transport discussed above are responsible for the size and shape of the beach. Long-term beach erosion is an indication that sand in the bay may have been lost offshore where waves cannot bring it back to the beach, or that insufficient sand is being produced by the reefs to replace sand moved out of the bay.

Beaches that have not been changed by man's development generally have sand berms or dunes in the backshore area just inland of the wave-washed beach. The berm provides natural shore protection and a source of sand that is important in beach dynamics during high wave or storm conditions. During some wave conditions sand is deposited by waves and the berm grows. During other conditions the berm erodes.
At Napili Bay, as in many other locations, the dune area contains beachfront buildings, and the dunes have been flattened or removed. Therefore, the natural coastal protection afforded by dunes does not exist, and high waves can threaten beachfront property.

During the first week of February 1993, deepwater wave heights in excess of 20 feet were recorded by the National Oceanographic and Atmospheric Administration’s data buoys near Maui (National Data Buoy Center, 1993). During the same period, very high tides up to 1.4 feet above mean sea level occurred in the early morning hours. Wave setup and runup at Napili Bay were calculated based on the wave height, tide, bottom bathymetry and beach slope. Wave runup to elevations in excess of 13 feet was found. Runup to this elevation means that waves were washing into the vegetation at the edge of the Napili Sunset lawn and hitting the rocks at the beach access. The calculations are supported by observations of Napili Sunset residents.

The wave heights that occurred during February 4–6, 1993, have a statistical return period of less than five years or a probability greater than 20 percent of occurring each year (Coastal Engineering Research Center, 1986). Waves of similar height can be expected to reach the lawn of Napili Sunset in the future.
Figure 3. Rock Shore Stabilization
Figure 5. Beach Profiles
Figure 5. (Continued)
Figure 6. Sand Size Distribution
IV. EFFECTS OF SHORELINE STABILIZATION ON BEACH

Because the rock shore stabilization at Napili Sunset is not hit by waves except under high wave conditions, it has minimal impact on transport of beach sand. For beach sand to be transported either longshore or on-shore/offshore, it must be put in suspension by waves and moved by currents. A seawall with its base in water contributes to erosion by reflecting waves and adding the reflected energy to suspend sand particles. Neither the rock structure at Napili Sunset or the sandbags at Hale Napili reflect waves under normal conditions.

The rock stabilization structure will have little or no impact on water quality or the habitat of marine life. Water quality may actually be improved by preventing topsoil from washing into the bay. Runoff drainage has been addressed by using the public access to the beach as a drainage path. This drainage has contributed to beach erosion in the past and further runoff control should possibly be considered; however, the rocks do not appear to substantially affect drainage. Portions of the beach are in the coastal flood zone as shown in Figure 7. The structure has little impact on flood hazard, but will provide protection to Napili Sunset. The structure has no impact on aquatic resources and minimal impact on recreational services/resources. Beach access or use are not impeded.

V. ALTERNATIVES AND MITIGATION

There appear to be two possible alternatives to maintaining the existing rock stabilization at Napili Sunset or the sandbags at Hale Napili - revetments or sand nourishment. Should the rock stabilization be damaged beyond repair, it could be reconstructed as a properly designed rubble revetment with a 1:2 slope. A rubble revetment dissipates wave energy and has minimal potential to cause beach erosion. However, a revetment requires more area than the present structure.

A possible long-term solution to erosion at Napili Beach is sand nourishment. Nourishment would mean obtaining sand from offshore sources and placing it on the beach, essentially moving the shoreline seaward. Nourishment is beyond the economic means of individual beachfront property owners and would require federal, state, and county cooperation for planning, funding, and execution.
Maintaining the existing rock stabilization structure is a viable method of erosion control. The structure has prevented further erosion since the February 1993 storm. The rocks have minimal affect on littoral transport. Without the rocks, the lawn would be damaged, the vegetation line would move closer to the buildings, and trees would be lost. Wave runup during high wave conditions could reach the bottom floor apartments.

The recommended mitigation for the rock stabilization is to maintain healthy vegetation on and shoreward of the rocks to stabilize soil and soften the appearance. Salt tolerant plants are required such as the morning glory and naupaka now growing at the site. In addition, if rocks are displaced from the structure, they should be replaced. Gaps in the structure can cause accelerated erosion.

VI. CONCLUSIONS AND RECOMMENDATIONS

The rock stabilization structure at Napili Sunset has minimal impact on beach erosion. Without the rocks, the lawn and buildings will be threatened by wave damage under wave conditions that have a probability of happening every year. Neither the rocks at Napili Sunset nor the sandbags at Hale Napili have a major effect on beach erosion at the neighboring property. Both properties are being affected by long-term beach erosion aggravated by short-term storm wave conditions. The rock stabilization should be left in place; however, if it is damaged beyond repair, it should be replaced by a rubble revetment properly designed and constructed. The County of Maui and State of Hawaii should consider a beach nourishment program for re-building eroding beaches with sand pumped from offshore sources.