STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

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MEMORANDUM

To: Genevieve Salmonson, Director
Office of Environmental Quality Control

From: Harry Yada, Acting Administrator
Land Division, Department of Land and Natural Resources

Subject: Final Environmental Assessment (EA)/Finding of No Significant Impact (FONSI) for the Flinn Single Family Residence, in the Conservation District, at TMK parcel [2] 1-7-01:049, Kaupo, Maui

The Department of Land and Natural Resources has reviewed the comments received during the 30-day public comment period that began on December 8, 2001 for the subject project. We have determined that this project will not have significant environmental effects, and have therefore issued a FONSI. Please publish this notice in the next issue of the OEQC Environmental Notice.

We have enclosed four copies of the Final EA for the project. Comments on the draft EA were sought from relevant county agencies, and were included with appropriate responses in the final EA. The applicant informs us that the project summary and OEQC Bulletin Publication Form have been e-mailed to you.

Please contact Traver Carroll of our Planning Branch at 587-0439 if you have any questions on this matter.

Enclosures

cc: Paul Flinn

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FILE COPY

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FINAL ENVIRONMENTAL ASSESSMENT

CONSERVATION DISTRICT USE APPLICATION

FOR

SINGLE FAMILY RESIDENCE AND RELATED IMPROVEMENTS

AT

KAUPO

TMK 1-7-1:49

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ENVIRONMENTAL ASSESSMENT

I. OVERVIEW

A. Nature of the Proposed Action

Pursuant to Chapter 13-5, Hawaii Administrative Rules, the proposed action will require the filing of a Conservation District Use Permit application, since the action involves the construction of a single family residence and related improvements within the State Conservation District, General Subzone, on property situated at Kaupo, Island of Maui, State of Hawaii (TMK 1-7-1:49).

B. Identification of the Applicant

Tax Map Key (TMK) Nos.	1-7-1:49
Property Owner/Applicant	Mr. & Mrs. Paul Flinn 1310 Piiholo Road Makawao, Hawaii 96768
Accepting Agency	Department of Land and Natural Resources 1151 Punchbowl Street Honolulu, Hawaii 96813

C. Site Information Summary

Location	Approximately 12 miles west of Hana Town, Island of Maui, on the west slope of Haleakala.

	Project site is on the *makai* side of Hana Highway.
Project Area	Approximately 0.5 acre.
Project Site Characteristics	Moderate to steep slopes; lomie to rocky soils; property line is on top of cliff, some 160 to 180 feet high.
Land Use Designations	Maui Community Plan: Conservation use State Land Use Commission (LUC) District Classification: Conservation District General Subzone Other: Within the Special Management Area (SMA) boundary, pursuant to HRS Chapter 205A. Proposed action is <u>exempt</u> from permit requirement under HRS §205A-22.
Existing Use	The project site and the immediate surrounding area are undeveloped. Also, the subject parcel does <u>not</u> contain any other residential dwellings.
Proposed Use	Single-family residence, and one ancillary structures (Total floor area: 1,696 square feet)

D. Major Approvals to be Sought

- Conservation District Use Permit: Board of Land and Natural Resources, State of Hawaii.

- Approval for Individual Wastewater System: Department of Health, State of Hawaii.

E. Summary of Proposed Action and Potential Impacts

The proposed action involves the construction of a single-family residence in the State Conservation District, General Subzone. The project site, which is vacant and undeveloped, encompasses an area of ± 0.5 acre within TMK 1-7-1:49.

The proposed project will consist of two (2) separate structures with a total floor area of approximately 1,696 square feet, as follows: (a) a one-story main dwelling of wood frame construction with a floor area of approximately 1,296 sq. ft. and building height of 24 feet; (b) and storage structure of approximately 400 sq. ft.

The proposed structures will be sited in such a way as to minimize grading work. Both structures will be setback a minimum of 150 feet from the shoreline. Native trees, shrubs and groundcover within the shoreline setback area as well as other areas on the property will be retained as a visual buffer and to maintain the existing natural character of the area. Also given the remote location, sloped topography, and existing vegetative cover, there is no visual impact of the proposed structures along Hana Highway, the main public road. The proposed project will <u>not</u> adversely impact any known significant historic or archaeological sites <u>nor</u> any rare, endangered or threatened species of flora or wildlife or associated critical habitat areas. In addition, the proposed action

will not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area.

The proposed single-family residence relates to similar uses of the area. The size of the proposed residential structure (1,296 sq. ft.) is substantially less than the 5,000 sq. ft. area allowed for a single-family residence in the Conservation District. The proposed structures will be of wood-frame and wood exterior construction and will reflect a simple design character.

II. DESCRIPTION OF THE PROPOSED ACTION

The proposed action involves the construction of a single-family residence in the Conservation District, General Subzone. The project site, which is approximately 0.5 acre in area, is part of 6.7 acre property.

The proposed single family residence will consist of two (2) separate structures with a total area of approximately 1,696 square feet, as follows: (a) a one-story dwelling of wood frame construction with a floor area of approximately 1,296 sq. ft. and building height of 24 feet; and (b) storage structure of approximately 400 sq. ft. *See Concept Building, Floor and Site Plans.*

The proposed structures will be sited on relatively level terraced sections of the site and will be setback a minimum of 150 feet in from the shoreline. Trees, shrubs and groundcover within the shoreline setback area will be retained as a visual buffer and to maintain the existing natural character of the area. The size of the proposed residential structure (1,296 sq. ft.) is

substantially less than the 5,000 sq. ft. area allowed for a single-family residence in the Conservation District. The proposed structures will be of wood-frame construction and will reflect a simple design character.

Other related improvements include the following:

- Installation of a photovoltaic power system to supply household electrical power;
- Installation of a solar water heater;
- Installation of a composting toilet/gray water system;
- Utilize an existing unimproved cattle road to service the storage building; and
- Landscape planting around the structures will include native tree planting.
- Construction of approximately 600 lf. of field fence along Hana Highway to help eliminate the pig problem.
- Water catchment (rainwater collection)

The existing access drive will be utilized for long-term access as well as for construction access and delivery of materials.

The proposed single-family dwelling will be maintained as a private family residence.

III. ALTERNATIVES TO THE PROPOSED ACTION

Other potential sites for a residential house on the property necessarily involve exposure to strong NE winds. The project site is protected from

the trade winds, and is also not visible from adjoining properties or the Hana Highway.

IV. DESCRIPTION OF THE PROJECT SITE AND ENVIRONMENTAL SETTING

A. Physical Environment

1. Location. The project site is located on the East End of the island of Maui and approximately 12 miles from the town of Hana. *See Location Maps.*

2. Characteristics of the Project Site. The project site comprises approximately 0.5 acres in area and is a portion of a 6.7 acre parcel.

   The project site is located on the *makai*-side of the Hana Highway. The site is maintained in open space. The area proposed for the single family residential structures are situated approximately 230 feet inland of the shoreline. Ground elevations range from 210 to 220 feet above sea level. The substrata is rocky. The storage building is situated approximately 150 feet inland of the shoreline.

   Access is available from Hana Highway on an unimproved driveway extending approximately 300 feet.

   The shoreline is a cliff approximately 160 feet high
   See Photographs of the project site.

3. Historic Traditional and Customary Uses of the Site.

For the past thirty (30) ± years the site has been used for cattle grazing.

Occasional fishing use of Mokuia Point across southerly point of property will not be affected in any way by the proposed single-family dwelling.

See Cultural Impact Assessment

4. Soil Characteristics. The soils within the project site are classified in the Kailua series that generally consist of moderately drained soils. More specifically, the soils of the project site are identified within the Kailua-Niulii complex (KRL).

5. Terrestrial Biota. Existing vegetation consists mainly of alien grasses and scattered *guava, java plum and mango.*

See Exhibit B -Botanical Survey TMK 1-7-1:49

Existing bird and animal life in the project vicinity include species common in the East End area. Avifauna typically found in the subject area includes the common mynah, several species of dove, cardinal, house finch, and house sparrow. Mammals common to the area include cats, dogs, mice, rats, and mongoose.

6. Climate. The average annual rainfall in this area of East Maui is between 5 to 8 inches between the months of October through March and between 2 to 5 inches between the months of April through September.

The East End of Maui generally has mild and uniform climate throughout the year. The average temperatures during the year are in the 60 to mid-80 degree range. The presence of consistent northeasterly trade winds is a climactic characteristic of the project site for much of the year. Air quality is considered to be excellent, and a typical urban source of noise (i.e. high volume of vehicles) is not prevalent in this rural setting.

7. Marine Environment. Steep cliffs and on shore trade winds hamper access to the waters edge. The Alenuhiaha Channel has strong S.W. currents that separate Maui and Hawaii approximately 25 miles away.

8. Surrounding Land Uses. Several vacant parcels are in the immediate vicinity of the project site. There are three properties that are occupied with single-family residence within the immediate area.

9. Agricultural Land Suitability. The project site and immediate surrounding have been occasionally used for cattle grazing. According to the Land Study Bureau, the overall agricultural productivity rating for the area is "D" due to slope and rockiness. According to the reference maps, Agricultural Lands of Importance to the State of Hawaii (ALISH), the project site is unrated.

10. Visual Resources. The project site is not identified in Maui Community Plan or other standard references as a scenic vista or resource. Due to the higher ground elevation of Hana Highway and the hilly terrain of the area, the project site is not visible from this road.

11. Noise Characteristics. Due to the undeveloped nature of the area, the primary sources of background noise are attributed to natural conditions (i.e. wind and shore surf). Helicopters create the most human noises in the area.

12. Air Quality. Air quality in the region of East Maui is considered good, since point sources and non-point sources of emission are not significant to generate high concentrations of pollutants.

13. Flood Hazard. According to the Federal Flood Insurance Rate Maps, the project site is located in "Zone C".

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12. Air Quality. Air quality in the region of East Maui is considered good, since point sources and non-point sources of emission are not significant to generate high concentrations of pollutants.

13. Flood Hazard. According to the Federal Flood Insurance Rate Maps, the project site is located in "Zone C".

14. Archaeological Resources. See Archaeological Inventory Survey. The following is a summary of information on the project site contained in the archaeological report. No significant sites were located on the survey parcel.

On the extreme south end of the property, there is access to Mokuia Point.
This access will be maintained. It is approximately 700 feet from the proposed residence and is not visually or physically accessible.

B. Socio-Economic Characteristics

1. The project site is situated in the rural setting of East Maui that generally includes the area from Hana to Kaupo. The East Maui area is characterized by scattered rural residential developments, expansive open space areas, and picturesque valleys and mountains.

2. According to the 1995 U.S. Census, the population of Hana area of Maui was 2,041 residents.

C. Public Infrastructure

1. Water: a private catchment system
2. Access: available along an unimproved dirt drive off of Hana Highway, a two-lane County right-of-way.
3. Electricity and Telephone: overhead telephone line is available along Hana Highway. No electricity is available.

4. Sewage disposal: the project site is not serviced by a public wastewater treatment system. Wastewater is disposed of by individual wastewater systems.
5. Solid Waste disposal: The residence collects their own trash and disposes it in the County landfill.
6. Drainage: the project site is not improved with a drainage system. Storm water runoff is disposed of by sheetflow and percolation into the ground.

D. Public Services

1. Fire Protection: A fire substation is located at Hana
2. Police Protection: The main Police Station is headquartered at Hana.
3. Emergency Medical: Ambulance service is headquartered in Hana.
4. Public Education: The Hana Elementary School and High School are located in the town of Hana.

V. PROJECT IMPACTS

A. Archaeological, Historic and Cultural Sites

The Project Archaeological Inventory Survey is enclosed in this report. There are no archaeological sites found on the property. There is a fishing access on the extreme south end of the property.

B. Site Conditions

The proposed residential structures are modest in scale and will be constructed to minimize land alteration and physical intrusion on

the area. The proposed structures will be sited on existing terraced sections of the site, thereby reducing extensive grading. All structures will be a sited at a minimum of 150-foot setback from the shoreline. Existing native trees and vegetation within the 150-foot shoreline setback area will be retained as a visual buffer. The proposed two (2) structures will have a total combined floor area of approximately 1,696 square feet, which is substantially less than the allowable floor area of 5,000 square feet. In conclusion, existing site conditions will not be significantly altered with the construction of the proposed residential dwelling.

C. Surrounding Areas

The proposed dwelling will be maintained as a private family residence. The proposed single-family residence will be modest in scale and situated a considerable distance from the shoreline.

D. Terrestrial Biota

See Botanical Survey

There are no known significant habitats of rare, endangered, or threatened species of flora located on the project site. Existing shrub vegetation will be cleared for the proposed structures. Healthy mature trees in the area will be maintained. Some of the existing Christmas Berry trees and may need to be removed. However, new native tree plantings will be added to retain the character of the near shore within the 150-foot shoreline setback. Additional native tree plantings (i.e. milo) are also proposed in the

vicinity of the house site to enhance the natural character of the area and visually buffer the proposed structures.

There are no known significant habitats of rare, endangered or threatened bird or animal life on the project site.

The shore area will not be impacted by the proposed project, since the proposed structure is approximately 160 feet above the rocky shoreline and a minimum of 150 feet away and native vegetative cover within the shoreline setback area will be maintained and enhanced.

E. Marine Resources

No impacts on the marine environment are anticipated during the construction and post construction phases of the project. The expected increase in stormwater runoff with construction of the proposed structures is 0.12 c.f.s., a very minimal amount. The additional runoff will sheetflow into catchment for watering of new native plants. The State Department of Health regulates storm water discharge from construction projects greater than 5.0 acres through the National Pollution Discharge Elimination System Permit (NPDES). In the case of the proposed project, this permit is not applicable, since the project site is approximately 0.5 acre in area.

Native landscape planting will be added in and around the proposed structures to incorporate similar species found in the area, including trees and ground cover. A gray water system will

be installed to collect, filter, and store household wash water for re-use in landscape irrigation.

A composting toilet will be installed for the project's individual wastewater disposal system that is subject to regulation by the State Department of Health. This type of system is a self-contained unit that has been used successfully in Hawaii and other locales for a number of years. The composting toilet does not require the use of chemicals or a leach field and is considered to be an environmentally safe system. *See documentation for Sun-Mar Cottage Toilets and Clivus compost toilet.*

The proposed dwelling will also feature a solar heating system for hot water and a photovoltaic home power system. Potable water will be provided from a catchment system or well.

In conclusion, the proposed project will not contribute to significant stormwater runoff or siltation and the discharge of other pollutants or wastewater that could affect the environmental quality of the near shore and marine environment.

F. Air Quality

Air quality impacts attributed to the project will be minimal or non-existent. Site work such as grubbing and construction of the residence will be done by hand. Given the limited scale of the proposed project, it is not anticipated that any adverse air quality impacts will occur.

G. Noise

As with air quality, ambient noise levels will increase during construction. However upon completion, it is anticipated that the project will not have an adverse impact on existing noise characteristics of the area.

H. Visual Resources

The project site is not identified in the Maui Community Plan or other planning documents as a significant scenic corridor or vista. The proposed residence will be located below the grade of Hana Highway and will not be visible from this public coastal roadway. Also, the proposed structures will be setback a minimum of 150 feet from the shoreline and will be visually screened from this area by existing vegetation. Given these factors and the relatively small scale of the proposed structures, the visual impacts of the project from the vantage point of the Hana Highway or along the shoreline will not be significantly intrusive.

I. Socio-Economic Environment

In the short-term, the project will provide limited construction and construction-related opportunities. In the long term, the establishment of a single-family residence will not result in a major population increase and attendant issues.

J. Traditional and Customary Rights

The proposed project site is not situated along any known access way or trail. The nearest access is a path, which is used by the

fishermen and is at the extreme south end of the property. See Archaeological and Cultural Report. It has been concluded that the proposed project will not directly impact shoreline access in the area.

Based on the foregoing, the proposed action will not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area.

K. **Public Services**

The proposed project is not anticipated to adversely affect or burden public services such as police or fire protection or medical services. Trash collection for the proposed project will be taken to the Hana Landfill.

L. **Infrastructure**

1. Wastewater-- A composting toilet will be installed for the project's individual wastewater disposal system that is subject to regulation by the State Department of Health. This type of system is a self-contained unit that has been used successfully in Hawaii and other locales for a number of years. The composting toilet does not require the use of chemicals or a leach field and is considered to be environmentally safe. *See documentation for Sun-Mar Cottage Toilets and Clovis compost toilet.*

2. Potable Water-- The proposed project will be serviced by a private catchment system

3. Access-- An existing unimproved driveway approximately 300 feet long from Hana Highway.

4. Drainage-- The grading of the site will be minimal and done by hand. The estimated 10-year stormwater runoff from construction of the project will increase from 0.08 to 0.20 c.f.s. or an additional 0.12 c.f.s. based on formulas and tables in the "Rules for the Design of Storm Drainage Facilities in the County of Maui". The additional runoff will be collected and put in a catchment container. The increase in runoff is insignificant, and existing drainage patterns will not be altered.

5. Electrical Power-- The project will utilize solar water heating and a photovoltaic power system.

VI. RELATIONSHIP OF THE PROPOSED ACTION TO PUBLIC POLICIES AND OTHER APPLICABLE LAND USE REGULATIONS

A. Maui County General Plan

The General Plan of the County of Maui is a long-range policy plan that was adopted by Ordinance No. 2234 and effective on September 27, 1991. The purpose of this plan is "(to) recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development and shall set forth the

desired sequence, patterns and characteristics of future development."

The proposed action respects the following objectives and policies of the General Plan:

• Policy: Identify and preserve significant historic and cultural sites (Land Use, Policy I.B.1.c.). Comment: In planning the proposed project, an archaeological inventory survey and cultural impact assessment was conducted, and it was concluded that no significant historic and cultural sites would be impacted by the project. In addition, it has been concluded that the proposed action will not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area.

• Policy: Protect prime agricultural lands from competing nonagricultural uses (Land Use, Policy I.B.3.a). Comment: The project site and immediate surrounding area have been used occasionally in the past for cattle grazing but is not classified as prime agricultural land, due to the relatively steep slopes and rocky terrain.

• Policy: To require that appropriate principles of urban design be observed in the planning of all new developments (Urban Design, Policy III.B.1.a). Comment: The proposed single-family residence will be sited a minimum of 150 feet inland of the shoreline. The project will incorporate a simple and energy efficient design

compatible with a rural area and in a manner that minimizes pollution and degradation of the natural environment.

B. Maui Community Plan

The proposed action respects the following objectives and policies of the Maui Community Plan:

• Policy: All zoning applications and/or proposed land uses and developments shall be consistent with the Community Plan policies (Land Use, Policy VI.B.2.h). Comment: The Community Plan land use designation is "Conservation" use and subject to the provisions of Chapter 13-5, Hawaii Administrative Rules, Conservation District. The proposed use is therefore consistent with the land use policies prescribed in the Community Plan.

• Policy: Recognize the importance of historically and archaeologically sensitive sites and encourage their preservation through development project review. Require development projects to identify all cultural resources located within the project area as part of initial project studies. Further require that all proposed activity include recommendations to mitigate potential adverse impacts on cultural resources (Support Systems: Human Services, Policy VI.D.1.k). Comment: As previously noted in planning the proposed project, an archaeological inventory survey was conducted, and it was concluded that there are no significant historic and cultural sites that would be impacted by the project.

C. Special Management Area Rules Pursuant to HRS Chapter 205A

The project site is situated within the Special Management Area (SMA) boundary established under the rules of the Maui Planning Commission. However, the Maui County Planning Department has determined that the proposed single-family residence is not a "development" subject to permit requirements, in accordance with HRS §205A-22 and applicable rules.

Also, the proposed single family residence will comply with County shoreline setback standards, since all structures will be sited a minimum of 150 feet from the certified shoreline, in accordance with the provisions of §12-4-4, Rules Relating to Shoreline Areas, Maui Planning Commission.

D. Evaluation Based on Criteria for Land Uses in the Conservation District, Section 13-5-30 (c)

The proposed single family residential use complies with the criteria for land uses in the Conservation District, as follows:

1. The proposed land use is consistent with the purpose of the conservation district.

   RESPONSE: Pursuant to Hawaii Administrative Rules §13-5-1, the purpose of the chapter is "to regulate land use in the conservation district for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare." As presented in the project's

Environmental Assessment, the proposed project has been designed to minimize potential adverse impacts on the area's natural resources. The structures will be sited on existing terraced sections, in order to minimize grading, and at a minimum of 150 feet from the shoreline. Within the 150-foot shoreline setback area, existing native healthy trees and vegetation will be maintained, in order to preserve the natural character of the area and to provide an appropriate visual buffer. The proposed residence is of modest scale and incorporates a total area of 1,696 square feet, which is substantially below the maximum allowable area of 5,000 square feet. The design of the structures reflects a rural character of simple woodframe construction. A composting toilet will be utilized for sewage disposal. The proposed single-family dwelling will be maintained as a private residence, and the occupation of same will not disrupt nor preclude the occasional fishing use of Mokuia Point. In addition, there are no known traditional, customary or religious practices in the immediate area. In conclusion, the proposed project is reasonable and appropriate for the area and includes adequate measures to protect natural and historic resources.

2. <u>The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur.</u>

RESPONSE: Pursuant to HAR §13-5-12, General subzone.

The proposed single-family residence will blend in to the area in a manner consistent with environmental design principles. The proposed residence is modest in scale (1,696 square feet total floor area) and will be sited a minimum of 150 feet *mauka* of the shoreline. The existing healthy trees within the shoreline setback will be retained to maintain the area's character and soften the visual mass of the proposed structures. The proposed project will involve minimal grading, since the objective is to site the structures on existing terraced sections of the land. The proposed structures will not adversely impact any known significant historic, archaeological or cultural resources, based on the findings and conclusions of the Project's Archaeological Inventory Survey and Cultural Survey. The proposed residence will incorporate solar water heating, composting toilet, and a photovoltaic power system, all of which are energy-efficient and environmentally appropriate for this locale.

3. <u>The proposed land use complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management," where applicable.</u>

   The project site is located within the County's Special Management Area (SMA). Construction of a single-family residence is exempt from the SMA permit requirements. (NOTE: See confirmation letter from the Maui County Planning Department.)

The project is subject to the County's Shoreline Setback requirements, pursuant to the Shoreline Area Rules of the Maui Planning Commission. For the subject property, the applicable shoreline setback area is 150 feet. The proposed structures will be located a minimum of 150 feet from the shoreline.

4. <u>The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.</u>

There are no known significant habitats of rare, endangered or threatened bird or animal life on the project site. The near shore cliff area will not be impacted by the proposed project, since the proposed structures will be located at a minimum of 150 feet away and existing vegetation within the shoreline setback area will be maintained.

Minimal or no impacts on the marine environment are anticipated during the construction and post construction phases of the project. The expected increase in stormwater runoff with construction of the proposed structures is 0.12 c.f.s., a very minimal amount and will be collected in a catchment. The State Department of Health regulates storm water discharge from construction projects greater than 5.0 acres through the National Pollution Discharge Elimination System Permit (NPDES). In the case of the proposed project, this permit is not applicable, since the project site is approximately 0.5 acre in area.

Native landscape planting will be added in and around the proposed structures to incorporate similar species found in the area, including trees and ground cover. A gray water system will be installed to collect, filter, and store household wash water for re-use in landscape irrigation. The added landscape planting and maintenance of the existing vegetative cover within the 150-foot shoreline setback area will serve as a buffer.

A composting toilet will be installed for the project's individual wastewater disposal system that is subject to regulation by the State Department of Health. This type of system is a self-contained unit that has been used successfully in Hawaii and other locales for a number of years. The composting toilet does not require the use of chemicals or a leach field and is considered to be an environmentally safe system. *See documentation for Sun-Mar Cottage Toilets and Clivus compost toilet.*

The proposed dwelling will also feature a solar heating system for hot water and a photovoltaic home power system. Potable water will be provided by catchment

In conclusion, the proposed project will not contribute to stormwater runoff or siltation and the discharge of other pollutants or wastewater that could affect the environmental quality of the near shore and marine environment.

5. The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

RESPONSE: The proposed residential structures are modest in scale and will be constructed to minimize land alteration and physical intrusion on the surrounding area. The proposed structures will be sited on existing terraced sections of the site, thereby reducing extensive grading. All structures will be a sited at a minimum of 150-foot setback from the shoreline, in accordance with County standards. Existing native trees and vegetation within the total site will be retained as a visual buffer. The proposed two (2) structures will have a total combined floor area of approximately 1,696 square feet, which is substantially less than the allowable floor area of 5,000 square feet. In conclusion, existing site conditions will not be significantly altered with the construction of the proposed residential dwelling. All new planting will be native plants. All grading for the structure is so minimal that it will be done by hand.

6. The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.

RESPONSE: The project site is not identified in the Maui Community Plan or other planning documents as a

significant scenic corridor or vista. The proposed residence will be located below the grade of Hana Highway and will not be visible from this public roadway. Also, the proposed structures will be setback a minimum of 150 feet from the shoreline and will be visually screened from this area by existing vegetation. Given these factors and the relatively small scale of the proposed structures, the visual impacts of the project from the vantage point of a Hana highway or along the shoreline will not be significantly intrusive.

7. Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district.

   RESPONSE: The proposed project does not involve the subdivision of land in the conservation district.

8. The proposed land use will not be materially detrimental to the public health, safety and welfare.

   RESPONSE: As documented in the Environmental Assessment, the project will comply with all appropriate governmental requirements relative to public environmental and health concerns during the construction and post-construction phases. The wastewater disposal system will be designed, in accordance with the requirements of the State Department of Health. Appropriate mitigative measures identified in the Environmental Assessment will be implemented to minimize the potential short-term construction impacts to air quality and marine water quality.

Accordingly, the proposed project would not be detrimental to the public health, safety and welfare.

E. **Section 13-5-23, Hawaii Administrative Rules, relating to Single Family Residences in the Conservation District**

The proposed single-family residence structures are specified as permitted uses in the General Conservation District, in accordance with HAR §13-5-23.

The proposed single-family residence complies with applicable rules as follows:

- The Applicant agrees to comply with standard conditions for single-family residences, as specified in HAR §13-5-42.

- In accordance with HAR Chapter 13-5 relating to "Single Family Residential Standards", compliance will be rendered, as follows:

Minimum Lot Size (10,000 square feet required):
TMK 1-7-1:49-- 6.7 acre parcel for proposed single family dwelling and storage building);

Minimum Setback: For lots over one (1) acre: 25 feet (front); 25 feet sides; 25 feet (back). As proposed, all setbacks will be exceeded. In addition, the shoreline setback will be a minimum of 150 feet for all structures.

Maximum Developable Area (5,000 square feet allowed): 1,696 square feet proposed.

Maximum Height Limit (25 feet allowed): 24 feet proposed

Compatibility Provisions: The proposed project will comply with the following: structures are designed to incorporate landscape screening; color scheme of earth tone intensity; DOH wastewater permit/ water collection system; minimal grading/contouring with consideration of slope; compliance with applicable building and grading code and shoreline setback provisions; and one kitchen.

VII. CONCLUSIONS

1. The proposed action is an appropriate use for the area and will not impact agricultural uses and traditional uses of the area. In addition, the proposed action will not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area.
2. The Environmental Assessment describes the proposed action, the expected consequences, both primary and secondary, and the cumulative, as well as the short-term and long-term effects of the action, in accordance with §11-200-12, Environmental Impact Statement Rules. The following are conclusions as to the significance of potential environmental effects:
    a. The proposed single-family residence will not involve an irrevocable commitment to loss or destruction of any natural or cultural resources.

b. The proposed single-family residence will not curtail the range of beneficial uses of the environment within the context of long-range plans, including the General Plan of the County of Maui and the adopted Maui Community Plan.

c. The proposed single-family residence does not conflict with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any subsequent revisions and public actions.

d. The proposed single-family residence will not substantially affect the economic or social welfare of the community or State.

e. The proposed single-family residence will not substantially affect public health.

f. The proposed single-family residence will not involve substantial secondary impacts, such as population changes or effects on public facilities.

g. The proposed single-family residence will not cumulatively result in considerable effect on the environment nor does it involve a commitment for larger actions.

h. The proposed single-family residence will not substantially affect a rare, threatened, or endangered species or its habitat.

i. The proposed single-family residence will not detrimentally affect the air or water quality or ambient noise levels.

j. The proposed single-family residence is not located in an environmentally sensitive area.

k. The proposed single-family residence will not substantially affect scenic vistas and view planes identified in county or state plans or studies.

1. The proposed single-family residence will not involve substantial energy consumption,

3. The project site is situated within the County's Special Management Area but is not a "development" subject to said permit requirements, in accordance with HRS §205A-22. The proposed single family residence complies with the County of Maui's shoreline setback area regulations, pursuant to HRS Chapter 205A and §12-4-4 of the Maui Planning Commission rules relating to the shoreline area.

4. The proposed single-family residence is a permitted use in the General subzone of the Conservation District, in accordance with §13-5-23, Hawaii Administrative Rules.

5. The proposed single-family residence complies with standards for a single-family residence, in accordance with §13-5-41, Hawaii Administrative Rules, and Exhibit 4 of said rules related to Single Family Residential Standards, September 6, 1994.

VIII. CONSULTED AGENCIES

1. County of Maui
   a. Planning Department
   b. Department of Water Supply

2. State of Hawaii
   a. Division of Aquatic Resources, Department of Land and Natural Resources
   b. Historic Preservation Division, Department of Land and Natural Resources

c. State Department of Health

d. State of Hawaii, Office of Environmental Quality Control

I. DLNR Master Application Form

Conservation District Use Application
For
Single Family Residence and Related Improvements
At Kaupo
Island of Maui

TMK 1-7-1:49

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I. DLNR Master Application Form

II. Landownership Documentation

III. Exhibits

1. Location Map
2. Tax Map
3. Boundary Survey
4. Site Map Depicting Site Area
5. Grading
6. Site Photo
7. House Floor Plan, Roof Plan
8. House Building Elevation
9. Storage Building Elevation and Plan
10. Archaeological Inventory Survey TMK 1-7-01:49
11. Cultural Impact Assessment
12. Botanical Survey – TMK 1-7-01:49
13. Letter dated April 16, 2001 from Maui County Planning Department determining that the proposed single family residential project is not a "development" and is therefore exempt from Special Management Area Rules for Maui Planning Commission.
14. Miscellaneous Technical Information

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. Box 621
HONOLULU, HAWAII 96809

CONSERVATION DISTRICT USE APPLICATION FORM

FOR DLNR USE ONLY
Reviewed _____
Date _____
Accepted by _____
Date _____
Docket/File No. _____
180-Day Exp. _____
EIS Required _____
PH Required _____
Board Approv. _____
Disapproved _____

(Print or Type)

SUMMARY PAGE

I. **LANDOWNER**
(If State Land, to be filled in by State of Hawaii or government entity with management control over parcel.)

Name Paul L. and Sally Ann Flinn

Address 1310 Piiholo Road

Makawao, Maui, HI 96768

Telephone No. (808) 572-0897; Work: (808) 242-1955

Signature _____

Date _____

NOTE: Signature of an authorized representative of DLNR under this section is not to be construed as an approval or as an application which shall be submitted separately with the appropriate fee. Also, for private lands with multiple owners, the application shall be signed by landowners whose property interests constitute or exceed 85% of the fee ownership of the parcel(s).

II. **APPLICANT**

Name: Paul L. and Sally Ann Flinn

Address: 1310 Piiholo Road
Makawao, Maui, HI 96768

Contact: Paul L. Flinn
Telephone No. Home: (808) 572-0897
Work: (808) 242-1955
Interest in Property :
Owner
(Indicate interest in property; submit written evidence of this interest)

*Signature _____

Date _____

*If for a Corporation, Partnership. Agency or Organization, must be signed by an authorized officer.

AGENT

Name: N/A

Address: N/A

Telephone No. N/A
Fax: N/A

III. TYPE OF PERMIT

X (1) Departmental permit (see section 13-5-33);
__ (2) Board permit (see section 13-5-34)
__ (3) Emergency permit (see section 13-5-35)
__ (4) Temporary variance (see section 13-5-36)
__ (5) Nonconforming uses (see section 13-5-37)
__ (6) Site plan approval (see section 13-5-38); or
__ (7) Management plan (see section 13-5-39)

IV. LAND PARCEL LOCATION

Island: Maui
County: Maui
District: Kaupo
Tax Map Key: (2) 1-7-001: 049
Area of Parcel: 6.683 acres (Indicate in acres or sq. ft.)
Term (if lease): N/A

V. SUMMARY OF PROPOSED IDENTIFIED LAND USE: *(Cite applicable section of Title 13-5, HAR. Attach additional sheet(s) as needed.)*

The applicant is proposing the construction of a single-family residence and related improvements. *See Exhibit 7 through 9.* The proposed single-family residence has a total floor area of 1,200 square feet, deck of 650 square feet and breezeway of 96 square feet. It is of wood frame construction and maximum building height of 24 feet; the storage building has a total floor area of 400 square feet and maximum building height of 18 feet.

The total building square feet is 1,296 square feet + 400 square feet = 1,696 square feet.

Other related improvements include the following:

- Construction of private catchment system;
- Installation of a photovoltaic power system to supply household electrical power;
- Installation of a solar water heater;
- Installation of a composting toilet/graywater system;
- Landscape planting around the structures, including native tree planting. Also within the 150-foot shoreline setback area, pruning of existing Christmas berry trees. Additional native trees (i.e.milo, hala) will be planted within the 150-foot shoreline setback area to replace trees that are removed;
- Construction of 600 L.F. of field fence on Hana Highway Right of Way.

Single-family residences are listed in §13-5-23,HAR, as a permitted use in the Conservation District.

VI. ENVIRONMENTAL REQUIREMENTS

Pursuant to Chapter 343, Hawaii Revised Statutes, and in accordance with Title 11; Chapter 200, Environmental Impact Statement Rules for applicant actions, an Environmental assessment of the proposed use must be attached. The Environmental assessment shall include, but not be limited to the following:

(1) Identification of applicant or proposing agency;

(2) Identification of approving agency, if applicable;

(3) Identification of agencies consulted in making assessment;

(4) General description of the action's technical, economic, social, and environmental characteristics;

(5) Summary description of the affected environment, including suitable and adequate location and site maps;

(6) Identification and summary of major impacts and alternatives considered, if any;

(7) Proposed mitigation measures, if any;

(8) Determination;

(9) Findings and reasons supporting determination; and

(10) Agencies to be consulted in the preparation of the EIS, if applicable.

Following the end of a 30-day review period for the Draft Environmental Assessment, any comments received along with their responses must be incorporated into the Final Environmental Assessment. If appropriate, the text, figures, tables, maps, and other ancillary parts of the Environmental Assessment should be revised.

Twenty copies of a Draft Environmental Assessment (EA), which meets the requirements of Chapter 343, HRS, are transmitted herewith.

VII. Description of Parcel

A. Existing Structures/Use. *(Attach description or map) and one set of original photographs. Also,, if applicable, include any previously obtained Federal, State and/or County permit approvals.*

Characteristics of the Project Site. The project site comprises approximately 0.5 of an acre in area and is a portion of 6.7 acre parcel, TMK 1-7-1:49.

The project site is located on the *makai*-side of the Hana Highway at Kaupo. The site is maintained in open space. The area proposed for the single-family residential structures is situated approximately 150 feet and 230 feet inland of the shoreline. Ground elevations range from 210 to 220 feet above sea level with flat terraces in sections. The substrata are rocky.

Access is available from Hana Highway on a gravel driveway extending approximately 300 feet into the site.

The shoreline is a cliff approximately 160 feet high and rocky along the ocean. The property line is on top of the cliff.

See Topographic Survey Map and Photographs of the project site.

Historic Uses of the site. For the past thirty(30)+ years the site has been used for the cattle grazing.

B. Existing utilities. *(If available, indicate size and location on map. Include electricity, water, telephone, drainage, and sewerage).*

1. Water: it is proposed to develop a catchment system.

2. Access: available on an unimproved 300 feet long dirt drive off of Hana Highway; a two-lane county right-of-way.

3. Telephone: overhead lines are available along Hana Highway
   Electricity: it is proposed to use solar power.

4. Sewage disposal: the project site is not serviced by a public wastewater treatment system. Wastewater is disposed of by individual wastewater systems.

5. Solid Waste disposal: we will dispose of it in the County landfill.

6. Drainage: the project site is not improved with a drainage system. Storm water runoff is disposed of by sheetflow and percolation into the ground.

C. Existing access. *(Provide map showing roadways, trails, if any. Give street name. Indicate width, type of paving and ownership).*

A dirt drive off of Hana Highway provides access to the site. *See Exhibit 4.*

D. Vegetation. *(Describe or provide map showing location and types of vegetation. Indicate if rare or endangered native plants and/or animals are present).*

Existing vegetation consists mainly of cane grasses and scattered mango and guava, noni, milo, hala, naopaka, kukui, are also on the site. The owner has also planted a number of all of the above native species. (Please see letter from Ho'olawa Farms enclosed)

Existing bird and animal life in the project vicinity include species common in the East End of Maui. Avifauna typically found in the subject area includes the common mynah, several species of dove, cardinal, house finch, and house sparrow. Mammals common to the area include cats, dogs, mice, rats, and mongoose.

There are no known significant habitats of rare endangered or threatened species of plants and animals.

E. **Topography;** *if ocean area, give depths. (Submit contour maps for ocean areas and areas where slopes are 40% or more. Contour maps will also be required for uses involving tall structures, gravity flow and other special cases).*

The area proposed for the single family residential structure is situated approximately 150 feet and 230 feet inland of the shoreline. Ground elevations range from 210 to 220 feet above sea level with flat terraces in sections. The proposed structures will be sited on the terraced sections, in order to minimize grading. All grading will be done by hand. The substrata are rocky. See grading plan, Exhibit 4 and 5.

The soils within the project site are classified in the Kailua/Niulii series that generally consist of moderately drained soils. More specifically, the soils of the project site are identified within the Rocky complex. It is moderately well drained, stony, ex-forest vegetation mango, guava and primary use forest grazing.

F. **If shoreline area, describe shoreline.** *(Indicate if shoreline is sandy, muddy, rocky, etc. Indicate cliffs, reefs, or other features such as access to shoreline).*

Between the ocean and the property there is a cliff approximately 160 feet high and approximately 30 to 50 ft in a horizontal direction. See Exhibit 6.

G. **Existing covenants, easements, restriction.** *(If State lands, indicate present encumbrances).*

N/A

H. Historic sites affected. *(If applicable, attach map and descriptions).*

Based on the project's archaeological inventory survey, there are no significant historic, cultural or archaeological resources in the area. (See Xamanek Researches Archaeological Inventory Survey)

VIII. Commencement Date: July 2002

Completion Date: July 2003

IX. Cite and Describe in Detail the Proposed Identified Land Use: (Refer to Title 13-5, HAR. Attach additional sheets as needed.)

The proposed action involves the construction of a single-family residence in the Conservation District, General Conservation at Kaupo, Island of Maui. The project site, which is approximately 0.5 acre in area, is part of 6.7 acre property.

The proposed single family residence and storage building will consist of a total area approximately 1,696 square feet, as follows: (a) a one-story dwelling of wood frame construction with a floor area of approximately 1,296 square feet and building height approximately 24 feet; (b) storage building of approximately 400 square feet. *See Concept Building, Floor and Site Plans. Exhibits 7 thru 9.*

The proposed structures will be sited on relatively level terraced sections of the site and will be setback between 150 feet and 230 feet from the shoreline. Existing trees, shrubs and groundcover within the area will be retained as a visual buffer and to maintain the existing natural character of the area. The finish floor of proposed habitable structures will be set at approximate elevation of 219 feet. The size of the proposed residence (1,296 square feet) is substantially less than the 5,000 square feet area allows for a single-family residence in the Conservation District. The proposed structures will be of wood-frame and rock construction and will reflect a simple design character.

Other related improvements include the following:

- Construction of a catchment system;
- Installation of a photovoltaic power system to supply household electrical power;
- Installation of a solar water heater;
- Installation of a composting toilet/graywater system;
- Landscape planting around the structures, including native tree planting. Also within the 150-foot shoreline setback area, pruning of existing Christmas berry trees. Additional native trees (i.e.hala and milo) will be planted within the 150-foot shoreline setback area to replace Christmas berry trees that are removed.
- Construction of 600 L.F. of field fence on Hana Highway Right of Way.

The proposed single-family dwelling will be maintained as a private family residence.

X. **Area of Proposed Use:** (Indicate in acres or sq. ft.) Total floor area of all structures noted below = 1,696 s.f.
(Dwelling floor area = 1,296 s.f.)
(Storage building = 400 s.f.)

XI. **Name and Distance of nearest Town or Landmark:**

Hana Town is 14 miles north.

XII. **Land Use Commission Boundary Interpretation:** *(If the area is within fifty feet of the boundary of the Conservation District, include map showing interpretation of the boundary by the State Land Use Commission).*

"CONSERVATION"

XIII. **Subzone Boundary Determination:** *Prior to the department receiving for processing and application for a permit, if the applicant's proposed land use lies within fifty feet of a subzone boundary, the applicant shall first notify the department of the intended use and seek a determination of the precise boundary of the subzone with respect to the parcel in question. (Refer to Section 13-5-17, HAR.)*

"GENERAL"

XIV. **Fees**. *Each application shall be accompanied by such filing fees as specified in Chapter 13-5, HAR. All fees shall be in the form of cash, certified or cashier's check, and payable to the State of Hawaii.*

A $100.00 check is enclosed for the application filing fee for Board permits pursuant to Section 13-5-33, HAR.

A $100.00 check is enclosed for the application filing fee for Board permits pursuant to Section 13-5-33, HAR.

XV. **Plans**. *All applications shall contain associated plans such as a location map, site plan, floor plan, elevations and landscaping plans drawn to scale. Additionally, all plans should include a north arrow and graphic scale.*

A. **Area Plan**: *Area plan should include but not be limited to relationship of proposed uses to existing and future uses in abutting parcels; identification of major existing facilities; names and addresses of adjacent property owners.*

See Exhibit 2

B. **Site Plan**: *Site plan (maps) should include, but not be limited to, dimensions and shape of lot, metes and bounds, including easements and their use; existing features, including vegetation, water area, roads, and utilities. (For Site Plan Approvals, see Section 13-5-38, HAR.)*

See Exhibits 3, 4, & 5

C. **Construction Plan**: *Construction plans should include, but not be limited to, existing and proposed changes in contours; all buildings and structures with indicated use and critical dimensions (including floor plans); open space and recreation areas; landscaping, including buffers; roadways, including widths; offstreet parking area; existing and proposed drainage; proposed utilities and other improvements; revegetation plans; drainage plans including erosion sedimentation controls; and grading, trenching, filling, dredging or soil disposal.*

See Exhibits 4, 5, 7 thru 11

D. **Maintenance Plans**: *For all uses involving power transmission, fuel lines, drainage systems, unmanned communication facilities and roadways not maintained by a public agency, plans for maintenance shall be included.*

The owner will maintain the property and water system.

E. **Management Plans**: *If required, refer to Section 13-5-39, HAR, and Exhibit 3, entitled "Management Plan Requirements, dated September 6, 1994.*

Not required.

F. **Historic or Archaeological Site Plan**: *Where there exists historic or archaeological site on the State or Federal Register, a plan must be submitted including a survey of the site(s); significant features; protection, salvage, or restoration plans.*

Not Applicable.

XVI. Demonstrate that the Proposed Use is Consistent with the following criteria:

1. The proposed land use is consistent with the purpose of the Conservation District;

Pursuant to Hawaii Administrative Rules §13-5-1, the purpose of the chapter is "to regulate land use in the conservation district for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long–term sustainability and the public health, safety, welfare." As presented in the project's Environmental Assessment, the proposed project has been designed to minimize potential adverse impacts on the area's natural resources. The structures will be sited on existing terraced sections, in order to minimize grading, and at a minimum of 150 feet from the shoreline. Within the 150-foot shoreline setback area, existing healthy trees and vegetation will be maintained, in order to preserve the natural and historical character of the area, native plants will be used through out the property. The proposed residence is of modest scale and incorporates a total area of 1,696 square feet, which is substantially below the maximum allowable area of 5,000 square feet. The design of the structures reflects a rural character of simple woodframe and rock construction. A composting toilet will be utilized for sewage disposal. The proposed single-family dwelling will be maintained as a private residence, and the occupation of it will not disrupt nor preclude the occasional fishing use of Mokuia Point by fisherman. In conclusion, the proposed project is reasonable and appropriate for the area and includes measures to protect natural resources.

2. The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur;

Pursuant to HAR §13-5-12, the objective of the General subzone. The project site is designated Zone 'C', which is not a Special Flood Hazard Area. Pursuant to HAR §13-5-23, L-6, an identified land use in the general is "a single family residence that conforms to applicable county regulations regarding National Flood Insurance Program and single family residential standards outlined in this chapter."

The proposed single-family residence will be designed in a manner consistent with environmental design principles. The proposed residence is modest in scale (1,696 square feet total floor area) and will be sited a minimum of 150 feet and 230 feet *mauka* of the shoreline. The existing healthy trees within the shoreline setback will be retained. To maintain the area's historic character, native plants will be used through out the property. The proposed project will involve minimal grading (by hand), since the objective is to site the structures on terraced sections of the land. The proposed structures will not adversely impact any historic, archaeological or cultural resources, based on the findings and conclusions of the Project's Archaeological Inventory Survey. The proposed residence will incorporate solar water heating, composting toilet, and a photovoltaic power system, all of which are energy-efficient and environmentally appropriate for this locale.

3. **The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawaii Revised Statutes (HRS), entitled "Coastal Zone Management," where applicable;**

The project site is located within the County's Special Management Area (SMA). Construction of a single-family residence is exempt from the SMA permit requirements. (NOTE: See letter from the Maui County Planning Department)

The project is not subject to the County's Shoreline Setback requirements, pursuant to the Shoreline Area Rules of the Maui Planning Commission. State land abutts the shoreline but, for the subject property, the proposed structures will be located in a minimum of 150 feet and 230 feet from the shoreline.

4. **The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region;**

There are no known significant habitats of rare, endangered or threatened bird or animal life on the project site. The cliff area will not be impacted by the proposed project, since the proposed structures will be located at a minimum of 150 feet and 230 feet away and existing vegetation within this area will be maintained.

Minimal impacts on the marine environment are anticipated during the construction and post construction phases of the project. The expected increase

in stormwater runoff with construction of the proposed structures is 0.12 c.f.s., a very minimal amount. The additional runoff will be collected in a catchment container and used for watering plants. The State Department of Health regulates storm water discharge from construction projects greater than 5.0 acres through the National Pollution Discharge Elimination System Permit (NPDES). In the case of the proposed project, this permit is not applicable, since the project site is approximately 0.5 acre in area.

Landscaping with native plants will be added in and around the proposed structures to incorporate similar species found in the area, including trees and ground cover. A gray water system will be installed to collect, filter, and store household wash water for re-use in landscape irrigation. The added landscape planting and maintenance of the existing vegetation cover within the 150-foot shoreline setback area will serve to retain and filter any stormwater runoff that presently sheetflows to the ocean.

A composting toilet will be installed for the project's individual wastewater disposal system that is subject to regulation by the State Department of Health. This type of system is a self-contained unit that has been used successfully in Hawaii and other locales for a number of years. The composting toilet does <u>not</u> require the use of chemicals or a leach field and is considered to be an environmentally safe system. *See documentation for Sun-Mar Cottage Toilets and Clivus compost toilet.*

The proposed dwelling will also feature a solar heating system for hot water and a photovoltaic home power system. Potable water will be provided from a catchment system.

In conclusion, the proposed project will not contribute to significant stormwater runoff or siltation and the discharge of other pollutants or wastewater that could affect the environmental quality of the nearshore and marine environment.

5. **The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels;**

The proposed residential structures are modest in scale and will be constructed to minimize land alteration and physical intrusion on the area. The proposed structures will be sited on existing terraced sections of the site, thereby reducing extensive grading. All structures will be sited at a minimum of 150-foot setback from the shoreline. Existing trees and vegetation within the 150-foot shoreline setback area will be retained. The proposed 2 structures will have a total combined floor area of approximately 1,696 square feet, which is substantially less than the allowable floor area of 5,000 square feet. In conclusion, existing site conditions will not be significantly altered with the construction of the proposed residential dwelling.

6. **The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, which ever is applicable;**

The project site is not identified in the Maui Community Plan or other planning documents as a significant scenic corridor or vista. The proposed residence will be located below the grade of Hana Highway and will not be visible from this public roadway. Also, the proposed structures will be setback a minimum of 150 feet from the shoreline and will be visually screened from this area by existing vegetation. Given these factors and the relatively small scale of the proposed structures, the visual impacts of the project from the vantage point of the highway will not be visible.

7. **Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District;**

The proposed project does not involve the subdivision of land in the conservation district.

8. **The proposed land use will not be materially detrimental to the public health, safety and welfare.**

As documented in the Environmental Assessment, the project will comply with all appropriate governmental requirements relative to public environmental and health concerns during construction and post construction phases. The wastewater disposal system will be designed, in accordance with the requirements of the State Department of Health. Appropriate mitigative measures identified in the Environmental Assessment will be implemented to

minimize the potential short-term construction impacts to air quality and marine water quality. Accordingly, the proposed project would not be detrimental to the public health, safety and welfare.

II. Landownership Documentation

R-559

STATE OF HAWAII
BUREAU OF CONVEYANCES
RECORDED

JAN 21, 2000 08:02 AM

Doc No(s) 2000-009167

/s/CARL T. WATANABE
ACTING
REGISTRAR OF CONVEYANCES

CONVEYANCE TAX: $375.00

RIS

After Recordation Return by: MAIL (X)

PAUL LEROY FLINN, Trustee
563 B Piiholo Road
Makawao, HI 96768

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****
*********DO NOT MARK THIS********
**********AREA**********
****

INTIC
700072
(2)
8pgs

TITLE OR TYPE OF DOCUMENT: **WARRANTY DEED TO TRUST**

GRANTOR: **KAUPO HUI, a Hawaii general partnership**
P. O. Box 880298
Pukalani, HI 96788-0298

GRANTEE: **PAUL LEROY FLINN, as Trustee under that certain Unrecorded Revocable Living Trust Agreement of Paul Leroy Flinn dated March 24, 1992**

Tax Map Key

Maui	1	7	001	049	
Island	Zone	Section	Plat	Parcel	HPR

DOCUMENT CAPTURED AS RECEIVED

WARRANTY DEED TO TRUST

This Deed is made this 18 day of January, 2000, by and between KAUPO HUI, a Hawaii general partnership, whose mailing address is P.O. Box 880298, Pukalani, Maui, Hawaii 96788-0298, hereinafter called the "Grantor" and PAUL LEROY FLINN, as Trustee under that certain unrecorded Revocable Living Trust Agreement of Paul Leroy Flinn dated March 24, 1992, having all powers under said trust agreement, including full power to sell, convey, exchange, mortgage, lease, assign or otherwise deal with and dispose of all lands of the trust estate and interests therein, whose residence and mailing address is 1310 Piiholo Road, Makawao, Island and County of Maui, State of Hawaii, 96768, hereinafter called the "Grantee."

WITNESSETH:

That Grantor, for and in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and for other good and valuable consideration, to Grantor paid by Grantee, the receipt whereof is hereby acknowledged, does hereby remise, grant, sell and convey unto Grantee, as Tenant in Severalty, Grantee's successors in trust and assigns, in trust for the uses and purposes and with all the powers set forth in the aforesaid Revocable Living Trust Agreement, including without prejudice to the foregoing, full power and authority to sell, convey, exchange, partition, mortgage, lease, pledge or otherwise deal with and dispose of said real property, according to the sole judgment and discretion of the trustee, which real property is described as follows:

> Lot 49 - A portion of Land Commission Award 4074, Royal Patent Grant 2194, situate at Kalepa and Mokuia, Kaupo, Maui, Hawaii, TMK: (2) 1-7-001:049, containing an area of 6.7 acres, more or less, all as more fully described in Exhibit "A" attached hereto and incorporated herein by reference.

AND the reversions, remainders, rents, issues and profits thereof, and all of the estate, right, title and interest of Grantor, both at law and in equity, therein and thereto.

TO HAVE AND TO HOLD the same, together with all buildings, improvements, rights, easements, privileges and appurtenances thereon and thereto belonging or appertaining or held and enjoyed therewith to Grantee, according to the tenancy herein set forth forever.

And Grantor hereby covenants with Grantee that Grantor is lawfully seized in the property above-described in fee simple and has good right to sell and convey the same as aforesaid; that said property is free and clear of all liens and encumbrances except as herein described; and that Grantor shall warrant and defend the

DOCUMENT CAPTURED AS RECEIVED

same unto Grantee against the lawful claims and demands of all persons, except as aforesaid.

The rights and obligations of the Grantor and Grantee shall be binding upon and inure to the benefit of their respective estates, heirs, personal representatives, executors, administrators, successors, successors in trust and assigns. All obligations undertaken by two or more persons shall be deemed to be joint and several unless a contrary intention shall be clearly expressed elsewhere herein.

The covenants herein set forth and the warranties of the Grantor concerning the same are expressly declared to be in favor of the Grantee, Grantee's heirs, devisees, administrators, personal representatives, executors, successors, successors in Trust and assigns forever.

The terms "Grantor" and "Grantee" shall include the Grantor, Grantee and their respective heirs, devisees, administrators, personal representatives, executors, successors, successors in trust, and assigns. The terms "Grantor" and "Grantee" shall include, if appropriate, the singular and plural and the use of any gender includes all genders.

IN WITNESS WHEREOF, the Grantor has hereunto set Grantor's hand the day and year first above written.

KAUPO HUI, a Hawaii general partnership

By _____
ROBERT L. COLE
Its: General Partner

By _____
ZADOC BROWN, JR
Its: General Partner

"Grantor"

3

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STATE OF HAWAII)
) SS.
COUNTY OF MAUI)

On this 18 day of January, 2000, before me personally appeared ROBERT L. COLE, to me known, who being by me duly sworn, did say that he is a General Partner of KAUPO HUI, a Hawaii general partnership, that the foregoing instrument was signed in the name of and in behalf of said partnership, and said partner acknowledged that he executed the same as his free act and deed and as the free act and deed of said partnership.

WENDY A. GOMES NOTARY PUBLIC STATE OF HAWAII

(Signature of Notary)

WENDY A. GOMES
(Print Name of Notary)

Notary Public, State of Hawaii
My commission expires: JUN 17 2003

STATE OF HAWAII)
) SS.
COUNTY OF MAUI)

On this 18th day of JANUARY, 2000, before me personally appeared ZADOC BROWN, JR., to me known, who being by me duly sworn, did say that he is a General Partner of KAUPO HUI, a Hawaii general partnership, that the foregoing instrument was signed in the name of and in behalf of said partnership, and said partner acknowledged that he executed the same as his free act and deed and as the free act and deed of said partnership.

(Signature of Notary)

MARILYN CUPCHOY
(Print Name of Notary)

Notary Public, State of Hawaii
My commission expires: 6-6-2002

4

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EXHIBIT "A"

All of that certain parcel of land, Being Parcel 49 of Tax Map Key:(2) 1-7-001, being a portion of Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa on the South (makai) side of the present Hana Highway, situated at Kalepa and Mokuia, Kaupo, Hana, Island and County of Maui, State of Hawaii and being more particularly described as follows:

Beginning at the Northeast corner of this parcel of land, on the Westerly boundary of Government Land, being Parcel 6 of said Tax Map Key:(2) 1-7-001, the coordinates of said point of beginning referred to Government Survey Triangulation Station "MOKUIA" being:

597.97 feet North
894.50 feet East

and running by azimuths measured clockwise from true South:

1. 0° 20' 00" 206.79 feet along said Government Land, being Parcel 6 of Tax Map Key:(2) 1-7-001 to a point at the top of cliff at shoreline;

Thence along said top of cliff at shoreline for the next thirteen (13) courses, the direct azimuths and distances being:

2. 30° 19' 00" 81.73 feet;
3. 39° 07' 00" 36.23 feet;
4. 120° 36' 00" 92.91 feet;
5. 56° 42' 00" 61.91 feet;
6. 69° 09' 00" 118.72 feet;
7. 34° 10' 00" 189.99 feet;
8. 19° 01' 00" 83.99 feet;

3

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9. 9° 32' 00" 83.67 feet;

10. 2° 26' 00" 38.70 feet;

11. 30° 26' 00" 77.64 feet;

12. 163° 40' 00" 41.63 feet;

13. 98° 02' 00" 55.92 feet;

14. 141° 35' 00" 14.07 feet to the Southwest corner of Grant 3212 to Kama;

15. 186° 20' 00" 895.02 feet along said Grant 3212 to Kama to a point on the South (makai) side of the present Hana Highway;

16. 281° 20' 00" 144.06 feet along said Hana Highway and along the remainder of said Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa;

Thence along same on the arc of a curve to the left, concave Northwesterly with a radius of 150.00 feet, the chord azimuth and distance being:

17. 249° 35' 00" 157.86 feet;

18. 217° 50' 00" 26.21 feet along said Hana Highway and along the remainder of said Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa;

Thence along same on the arc of a curve to the right, concave Southerly with a radius of 15.00 feet, the chord azimuth and distance being:

19. 270° 58' 00" 24.00 feet;

20. 324° 06' 00" 24.00 feet along said Hana Highway and along the remainder of said Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa;

Thence along same on the arc of a curve to the right, concave Southwesterly with a radius of 225.00 feet, the chord azimuth and distance being:

21. 335° 16' 00" 87.15 feet;

4

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22. 346° 26' 00" 98.29 feet along said Hana Highway and along the remainder of said Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa;

Thence along same on the arc of a curve to the left, concave Northeasterly with a radius of 80.50 feet, the chord azimuth and distance being:

23. 305° 00' 00" 106.54 feet;

24. 263° 34' 00" 5.50 feet along said Hana Highway and along the remainder of said Royal Patent 2947, Land Commission Award 4074, Apana 1 to Akaa to the point of beginning and containing an area of 6.7 Acres, more or less.

SUBJECT, HOWEVER, TO:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.

2. Shoreline setbacks: "Shoreline setbacks established pursuant to the laws of the State of Hawaii, or any political subdivision thereof, and any ordinances, rules or regulations adopted or promulgated by any governmental authority pursuant to such laws."

3. Seaward boundary: "Determination of the seaward boundary of the land described herein pursuant to the laws of the State of Hawaii."

4. Easement(s) for the purpose(s) shown below and rights incidental thereto as set forth in a document;

In favor of:	GTE Hawaiian Telephone Company Incorporated, a Hawaii corporation
Purpose:	utility
Recorded:	February 11, 1972, in the Bureau of Conveyances of the State of Hawaii, Book 8115, Page 177, dated January 17, 1972.
Affects:	the land described herein

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Being all the property conveyed by the following:

Warranty Deed

Grantor:	Robert L. Cole and Patricia F. Cole, husband and wife
Grantee:	Kaupo Hui, a Hawaii general partnership, as Tenant in Severalty, as to an undivided 74/75 interest
Dated:	February 26, 1982
Recorded:	April 19, 1982, in the Bureau of Conveyances of the State of Hawaii, Book 16283, Page 496.

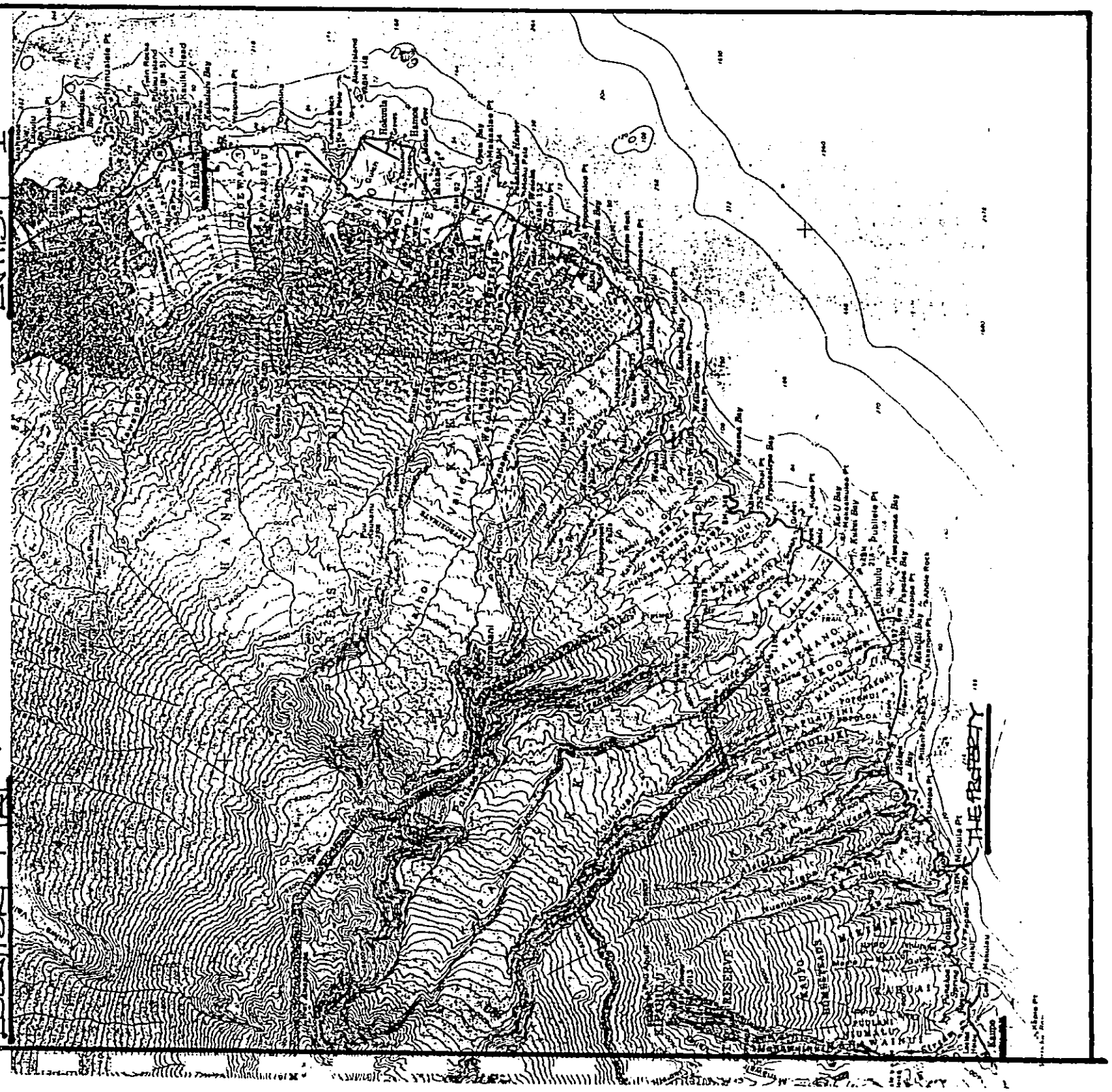
Warranty Deed

Grantor:	Walter Marvin Paul and Thelma C. Paul, husband and wife
Grantee:	Kaupo Hui, a Hawaii general partnership, as Tenant in Severalty, as to an undivided 1/75 interest
Dated:	March 26, 1982
Recorded:	August 23, 1989, in the Bureau of Conveyances of the State of Hawaii, Book 23557, Page 577.

III. Exhibits

EXHIBIT 1

LOCATION MAP



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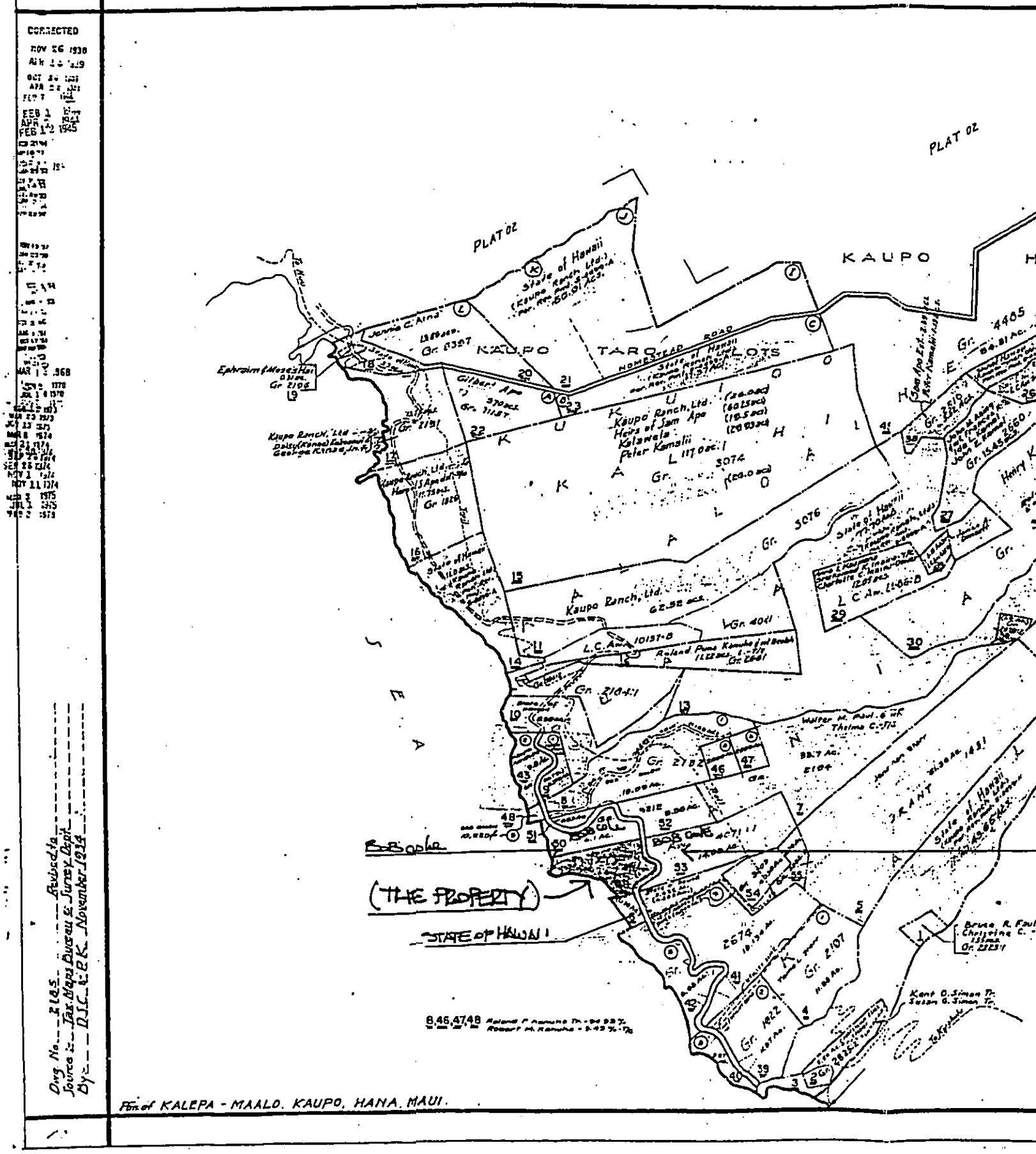
TAX MAP PLAT



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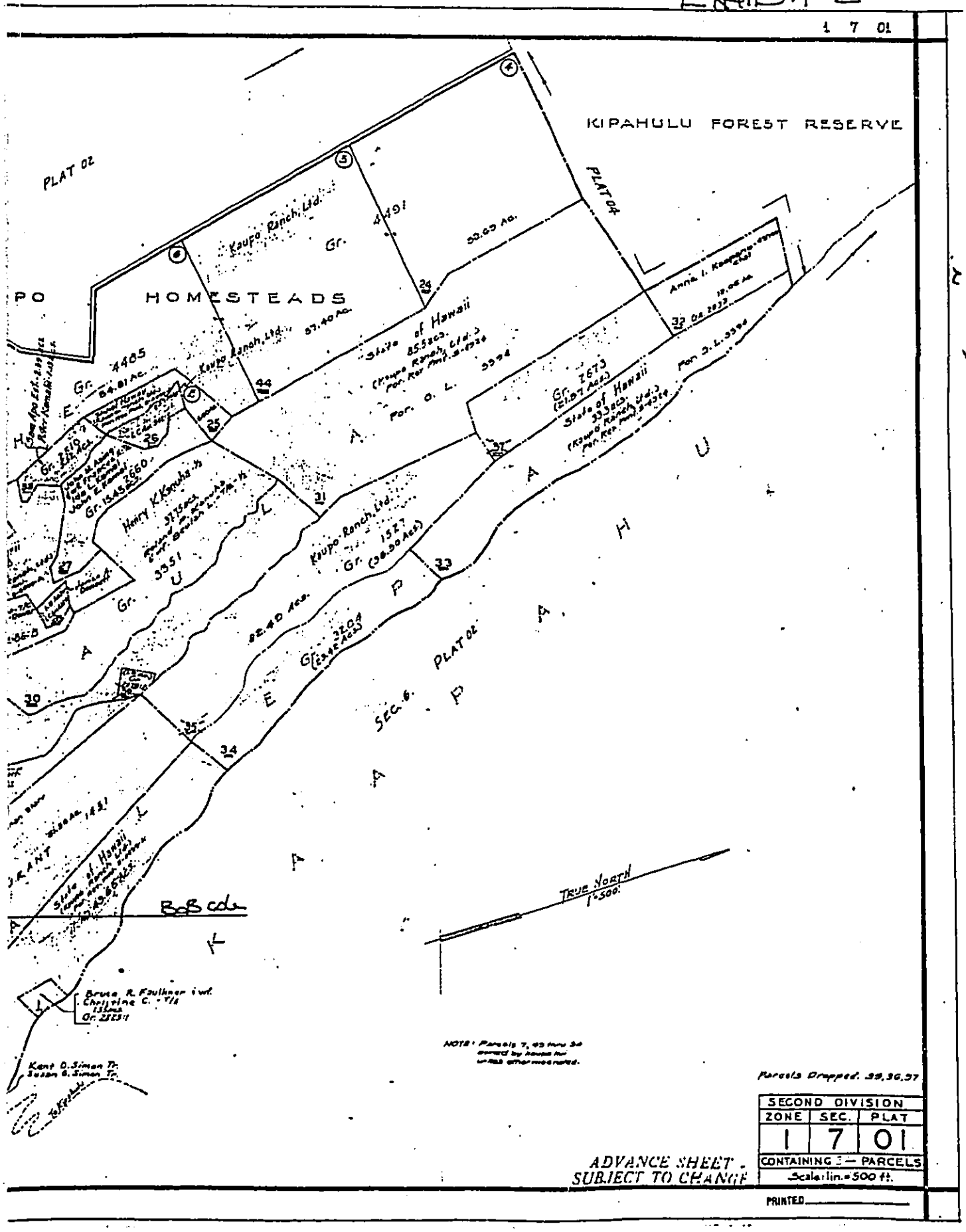

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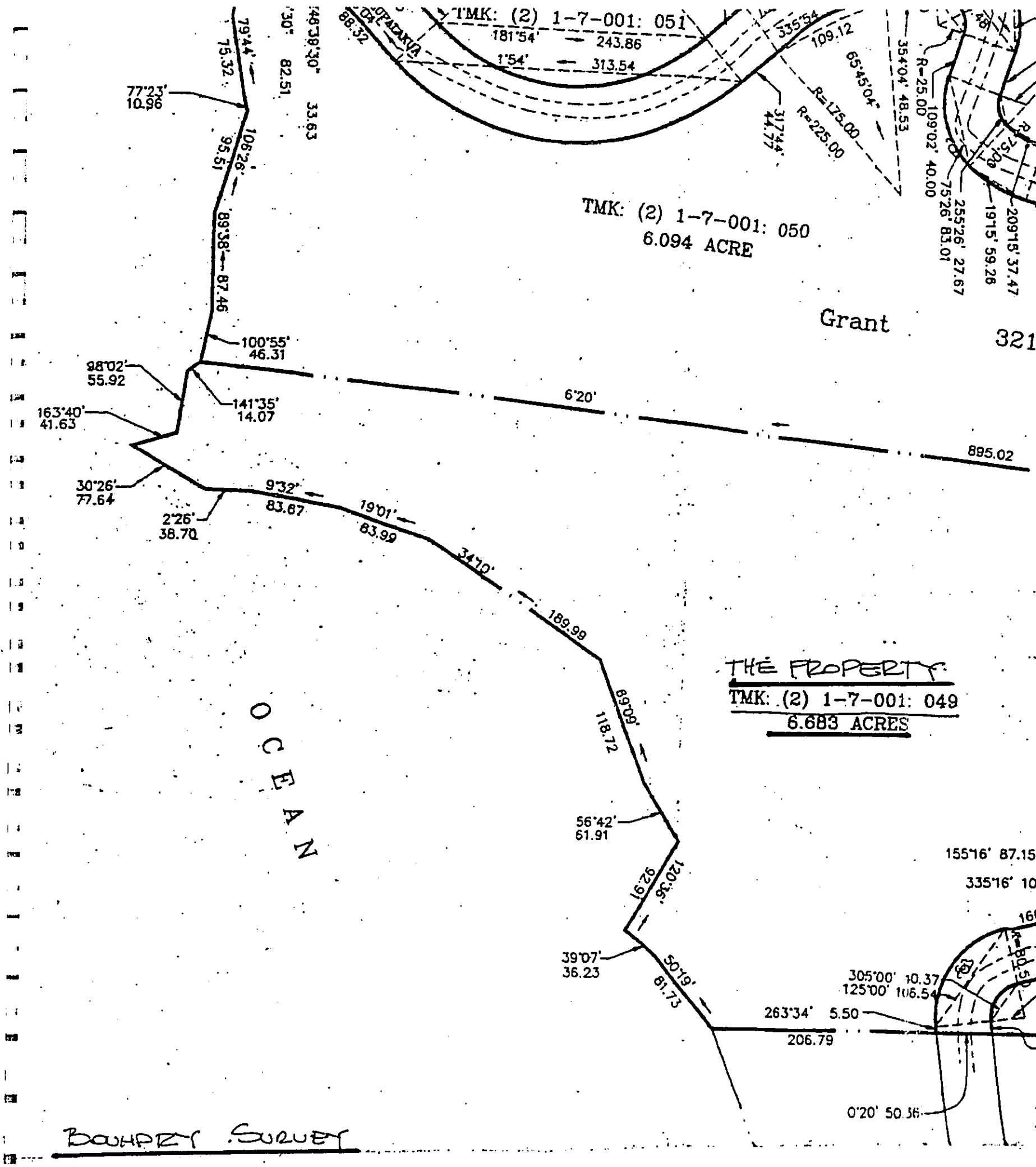

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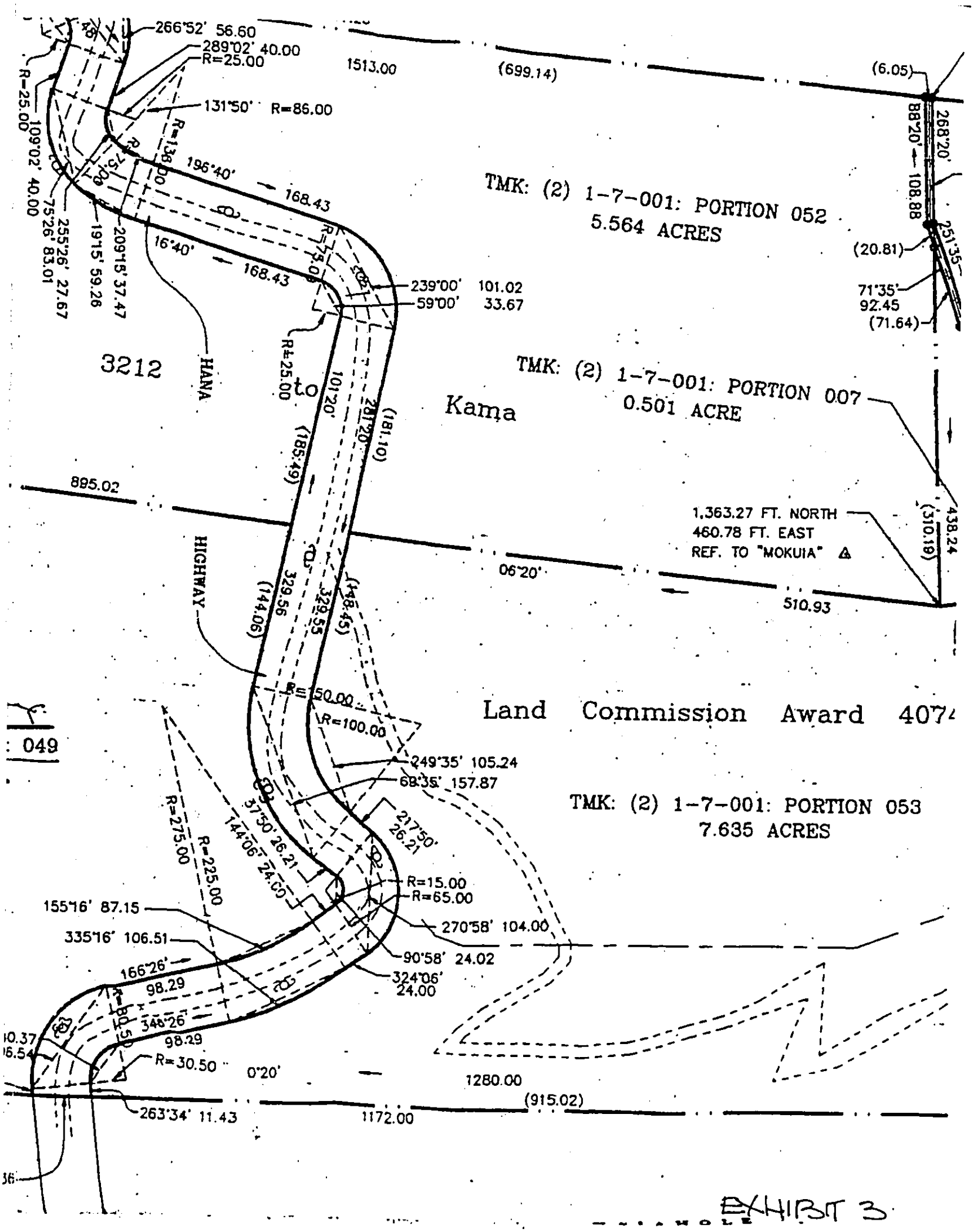

EXHIBIT 3

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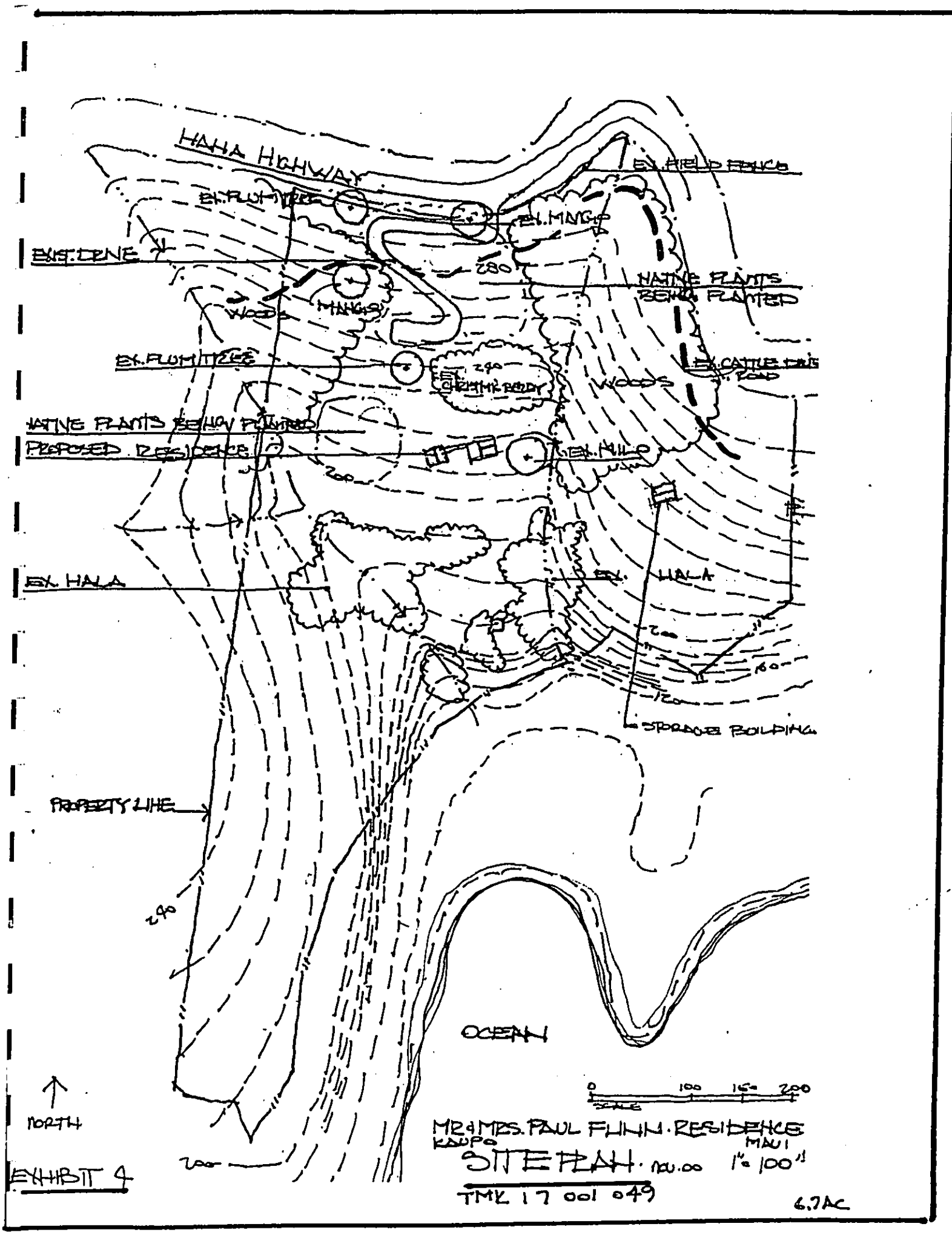

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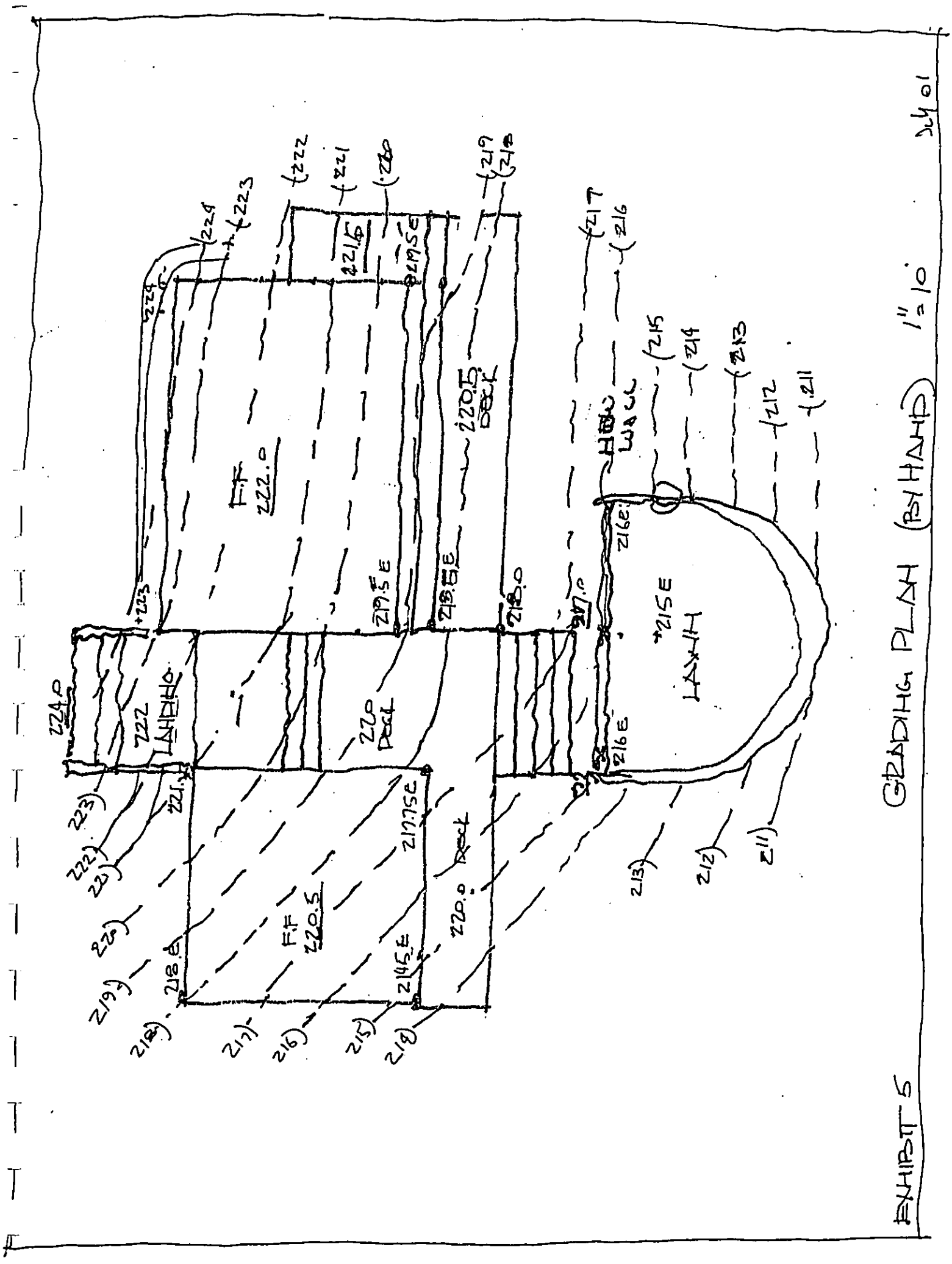

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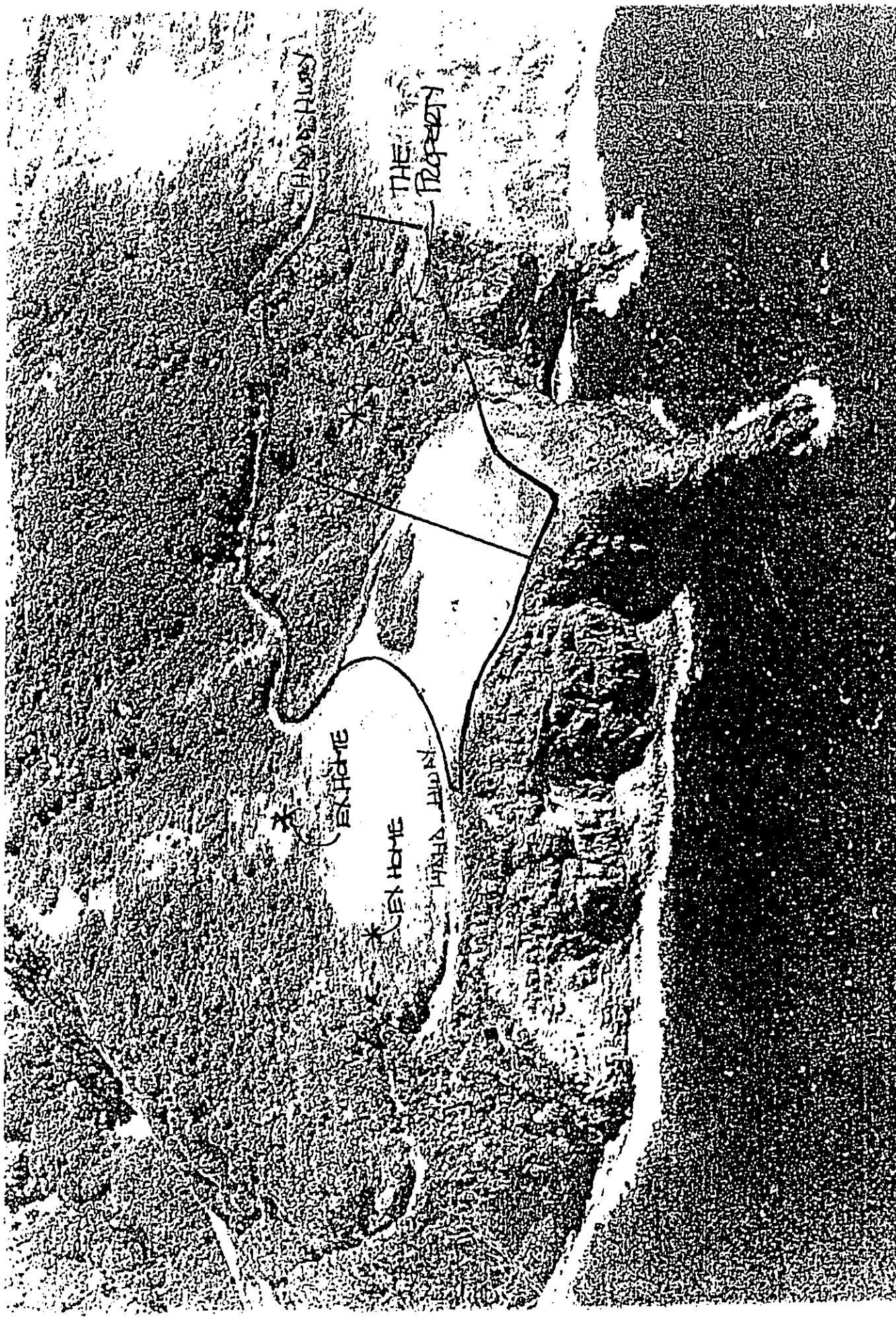
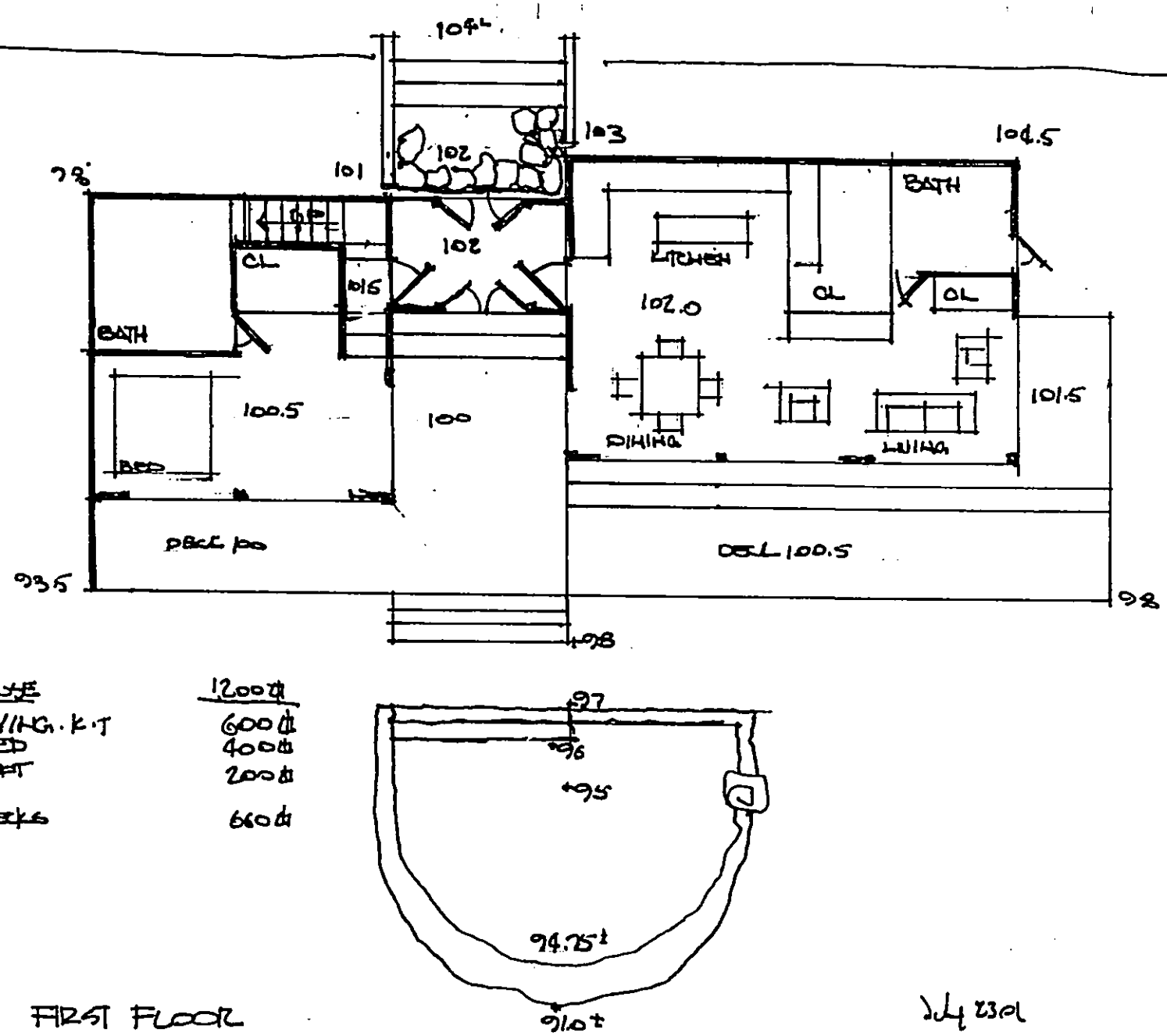


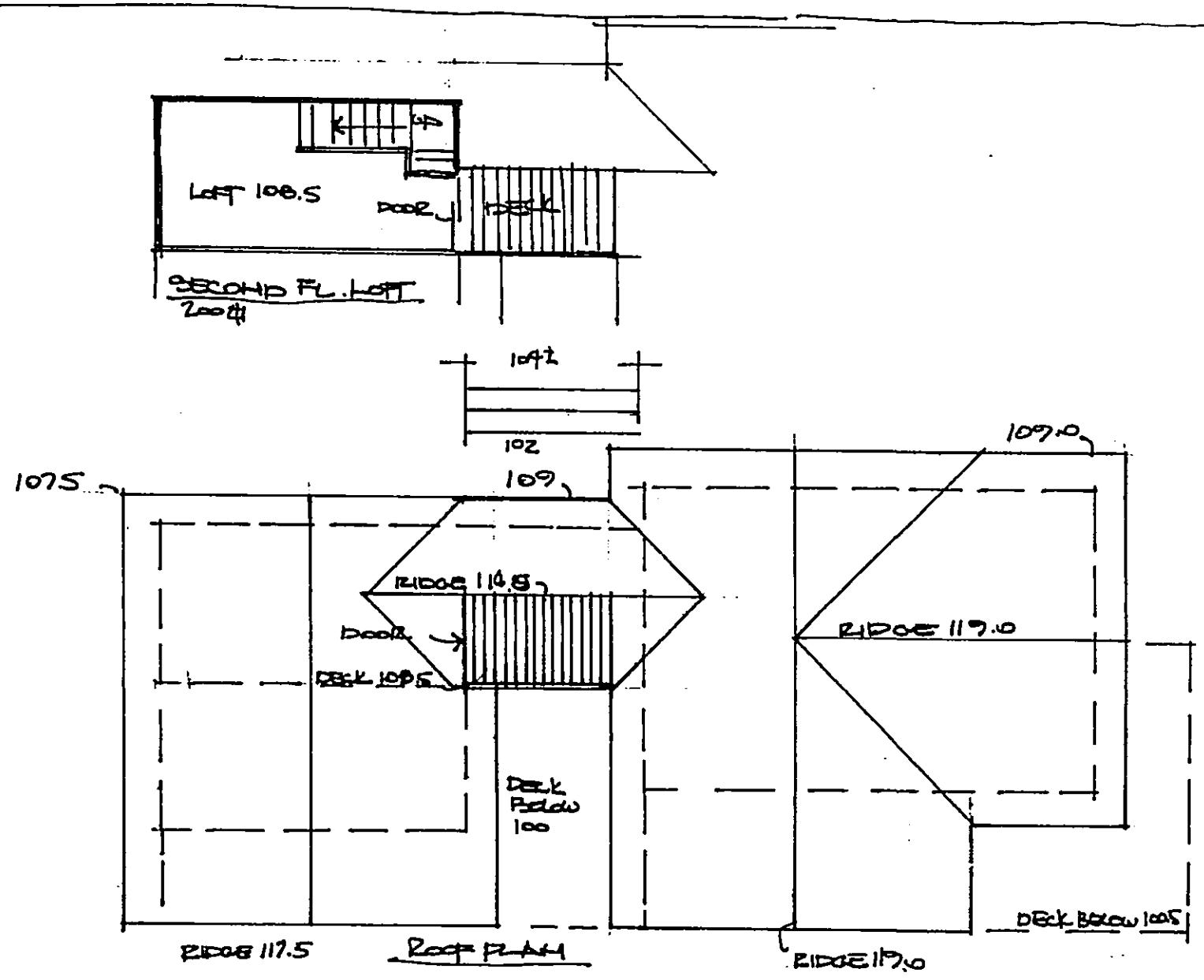


HOUSE	1200 ft
LIVING · K · T	600 ft
BED	400 ft
LOFT	200 ft
DECKS	660 ft

FIRST FLOOR

MR & MRS PAUL FLINN RESIDENCE KAUPO MAUI 1/10'

EXHIBIT 7

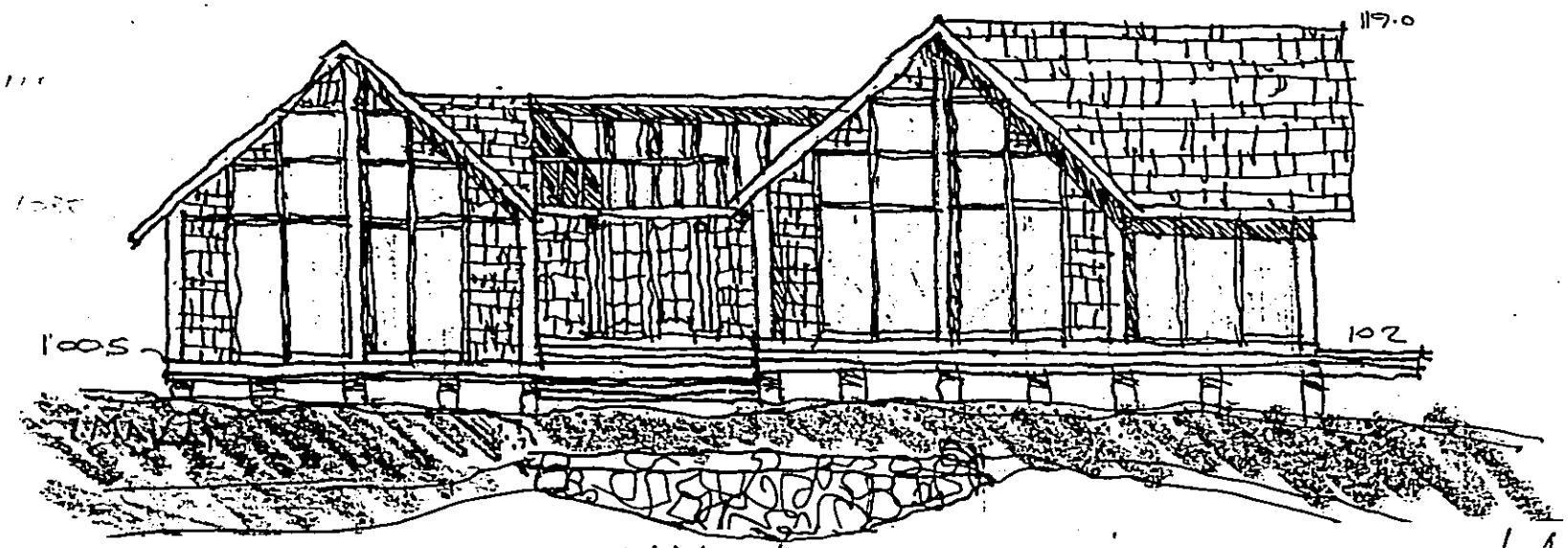


ROOF 10"/12"

July 2001

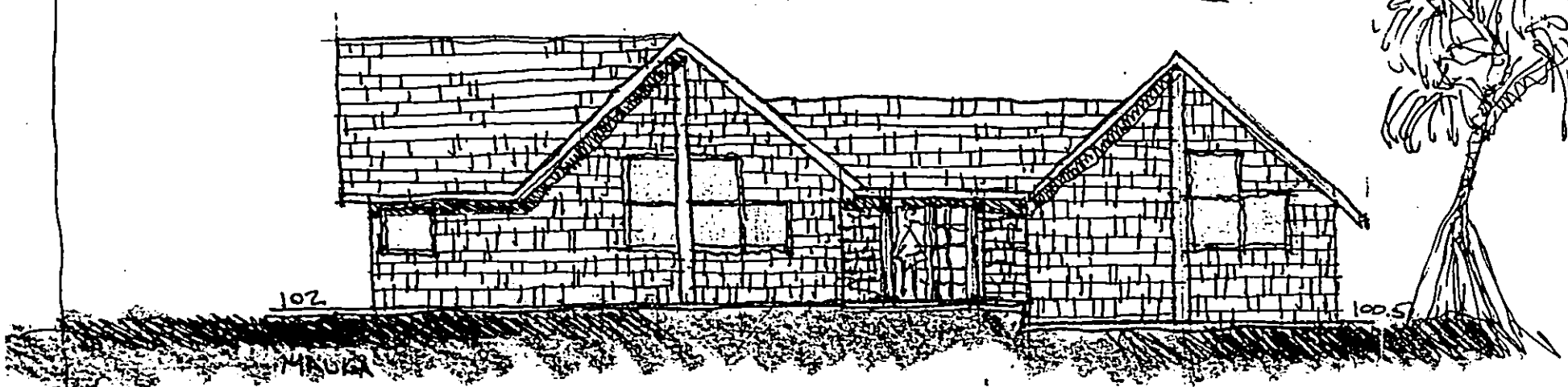
MR & MRS PAUL FLIHM RESIDENCE KAUPO MAUI 1/8"

EXHIBIT 7



MAKAI ELEVATION

MR & MRS. PAUL FLINN RESIDENCE KAUPO MAUI

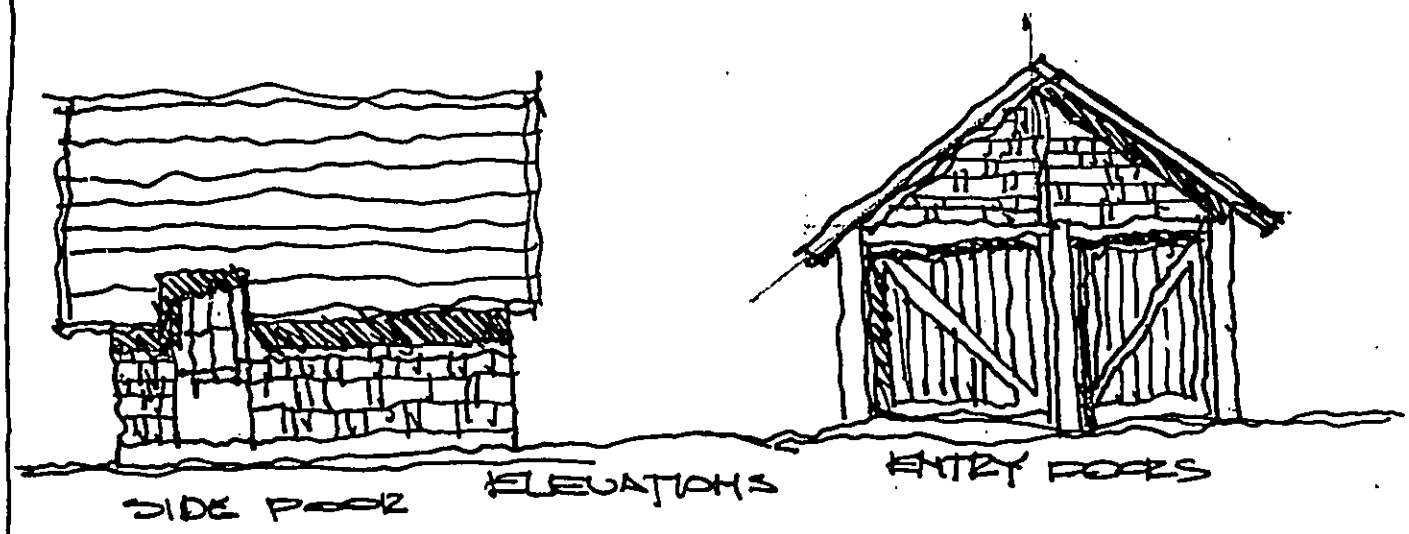


MAUKA ELEVATION

1"-10'

EXHIBIT 8

W401



FLOOR PLAN:

• STORAGE BUILDING • ELEVATION & PLAN •
400 S.F.

July 01

EXHIBIT 9

XAMANEK RESEARCHES
P.O. BOX 131
PUKALANI, MAUI, HAWAII 96788
Phone/FAX: (808) 572-8900
Phone/FAX: (808) 572-6118

Mr. Paul Flinn
1310 Piiholo Rd.
Makawao, HI 96768

Dear Mr. Flinn, **3 February, 2001**

Subject: Field work summary letter report for an archaeological inventory survey conducted on a parcel of land in Kaupo *Ahupua'a* Hana District, Island of Maui (TMK: 1-7-01: 049).

The subject parcel is presently not in use. You have installed a c. 120 meter (400 foot) long fence along the edge of the Hana Highway right-of-way. This installation occurred in a fill area associated with the construction of the state highway. Erik Fredericksen previously inspected this area adjacent to the road in 2000. No significant historic sites or material culture remains were noted during this earlier inspection. Xamanek Researches completed the field work portion of an archaeological inventory survey on your c. 6.5 acre parcel of land in Hana District, Maui, in late January 2001 (see Figure 1).

The project area lies along the Kaupo coast, but does not have ready shoreline access due to high (25 to 45 meter) sea cliffs. The subject parcel ranges from 110 ft AMSL to nearly 300 ft AMSL. Two small gullies (intermittent flow) cross the project area. Annual precipitation on this portion of Maui ranges from 40 to 60 inches. Observed alien plant species on the study area included Christmas Berry (Schinus terebinthifolius), Java Plum (Syzygium cumini), mango (Magnifera indica), papaya (Carica papaya), *koa haole* (Leucaena leucocephala), lantana (Lantana camara), various ferns, grasses, and annual succulent weeds. Observed native vegetation included *hala* ((Pandanus tectorius), *hau* (Hibiscus tiliaceus), *milo* (Thespesia populnea), *Naupaka kahakai* (Scaevola sericea), and *kukui* (Aleurites moluccana).

Our inventory survey consisted of two phases—a pedestrian walk-over, and subsurface testing. Pedestrian sweeps were spaced c. 5 meters apart, and visibility tended to be fair. Christmas Berry trees and fountain grass cover portions of the subject parcel. While no features were encountered during the surface inspection, a utilized basalt flake was found in one of the small gullies. However, no source area could be located for this indigenous artifact. It is interesting to note that visual inspection of the gully bank revealed what appeared to be recent erosive activity. Further evidence of recent erosion was found in the second gully to the southeast. An old bulldozed road (c. 30 years old)

across this gully had essentially been washed away during the course of the last three decades.

Subsurface testing was conducted on the parcel and did not yield any significant material culture remains. Given the robust erosive activity in the two gullies, it may be possible that the artifact located in the first gully may have been transported down slope from land (*mauka*) of the project area.

While there were no significant sites located on the project area, one site was noted on State land on Mokuia Point (Figure 1). This site is interpreted as a traditional Hawaiian fishing area. Mokuia Point is the only "safe" ocean access point near the subject parcel. The use of the term "safe" is relative in this case, because access is still somewhat dangerous, because of the relatively steep, eroding slope of the point. However, a series of three wooden ladders have been placed down the face of this point of land, and presently afford access. A rock overhang shelter (presently utilized by fishermen) lies at the base of the point. No additional work was carried out on Mokuia Point because it is off of the project area. This traditional fishing area has been designated SIHP No. 50-50-16-5058.

You have indicated that people presently gain access to this point across a c. 30 meter wide portion of your property. It is recommended that you make provisions for continued access to this point, because of its traditional cultural significance.

In summary, no significant sites were identified on this c. 6.5 acre parcel. However, it is important to note that a previously unidentified site lies on Mokuia Point, off of your parcel. Site 5058 qualifies for importance under Criterion "d" for its information content and Criterion "e" for its traditional cultural significance. No further archaeological work is recommended for your parcel. Please contact us if you require any information or have any questions about this letter report. We will submit an archaeological inventory survey report to the State Historic Preservation Division for review and comment.

Sincerely,

Erik M. Fredericksen

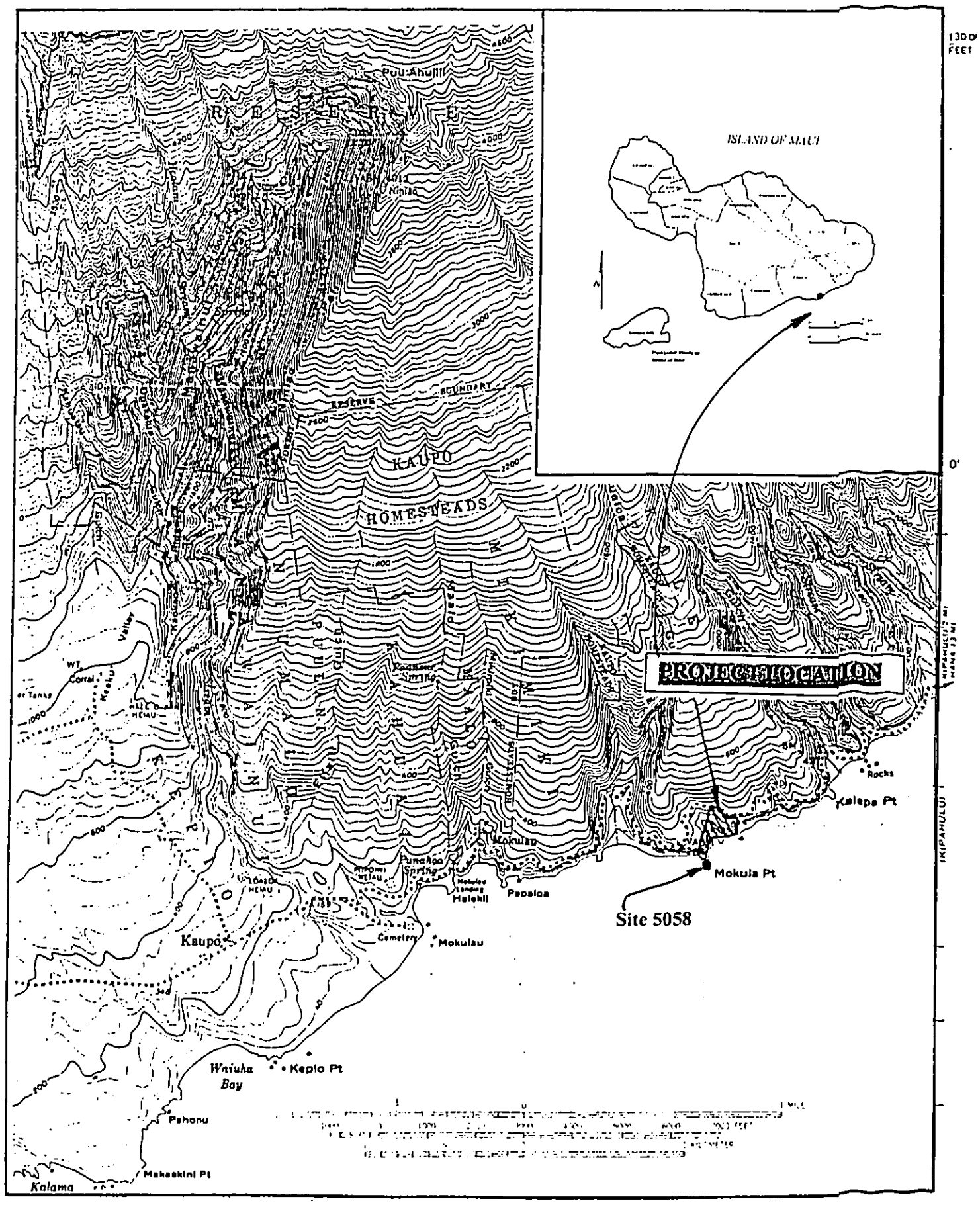


Figure 1: Project area, including location of Site 50-50-16-5058 on State land.

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An Archaeological Inventory Survey of a Parcel of land in Kalepa *Ahupua'a*, Kaupo *Moku*, Hana District, Island of Maui (TMK: 1-7-01: 49)

Prepared for:

Mr. Paul Flinn
Makawao, Maui

Prepared by:

Xamanek Researches
Pukalani, Maui

Demaris L. Fredericksen
Erik M. Fredericksen

30 April 2001

ABSTRACT

Xamanek Researches conducted an archaeological inventory survey on a c. 6.5 acre parcel of land in Kalepa *ahupua`a*, Kaupo *Moku* Hana District, Island of Maui (TMK: 1-7-01: 49). No significant sites were located on the survey parcel during the course of the survey. However, one previously unidentified site was noted for informational purposes on the State portion of Mokuia Point.

This site is interpreted as a traditional native Hawaiian fishing area. As such, it qualifies for importance under Criterion "d" for its information content, and under Criterion "e" for its cultural significance. This site retains its importance under both of the above significance criteria. While no further archaeological work is necessary for the subject parcel, it is recommended that the property owner continue to allow access to Mokuia Point through the project area.

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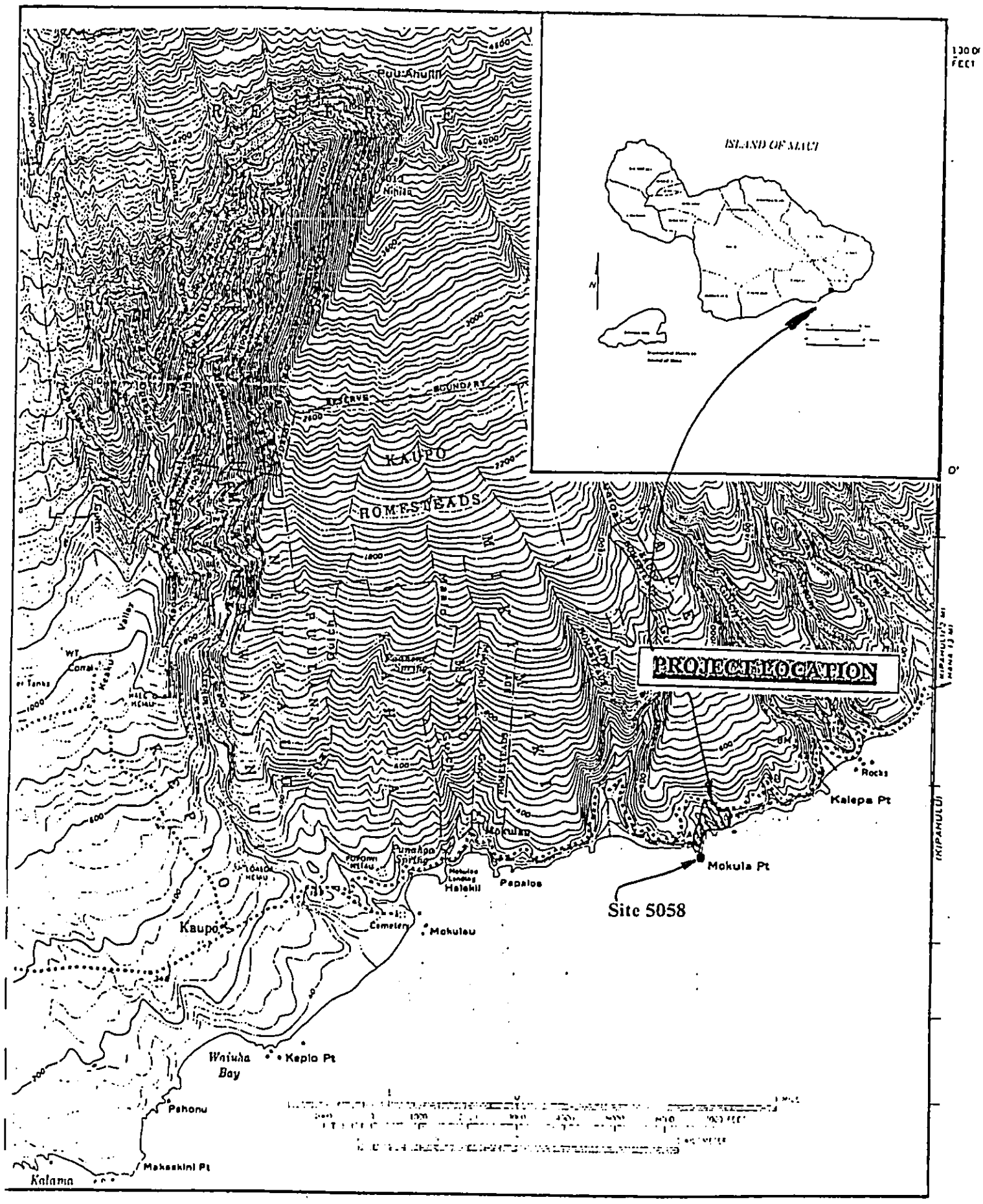

Map 1 – U.S.G.S. Topographic Map, Kaupo Quadrangle, 1983.

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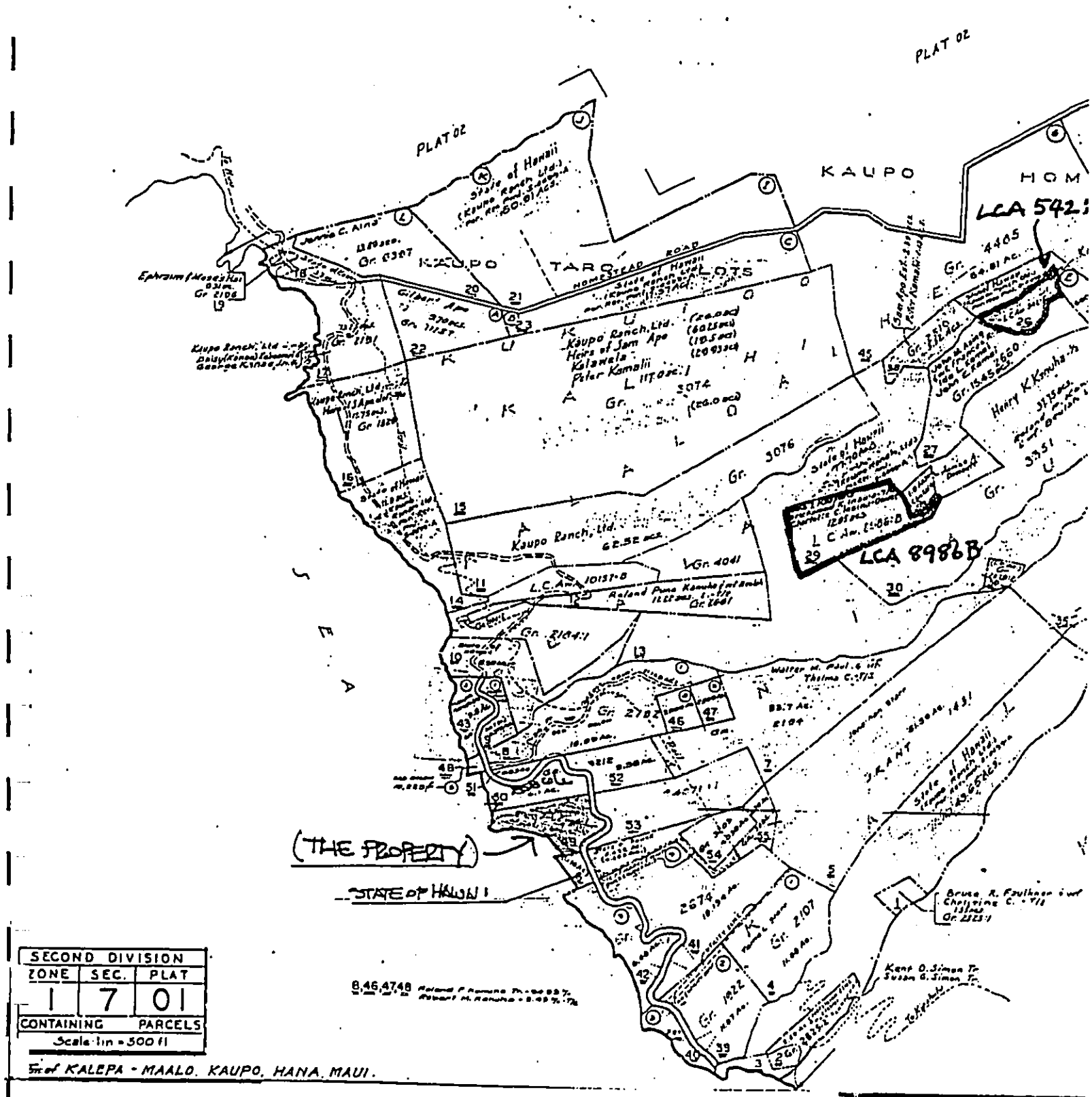

Map 2 – Tax Map, State of Hawaii, Taxation Division.

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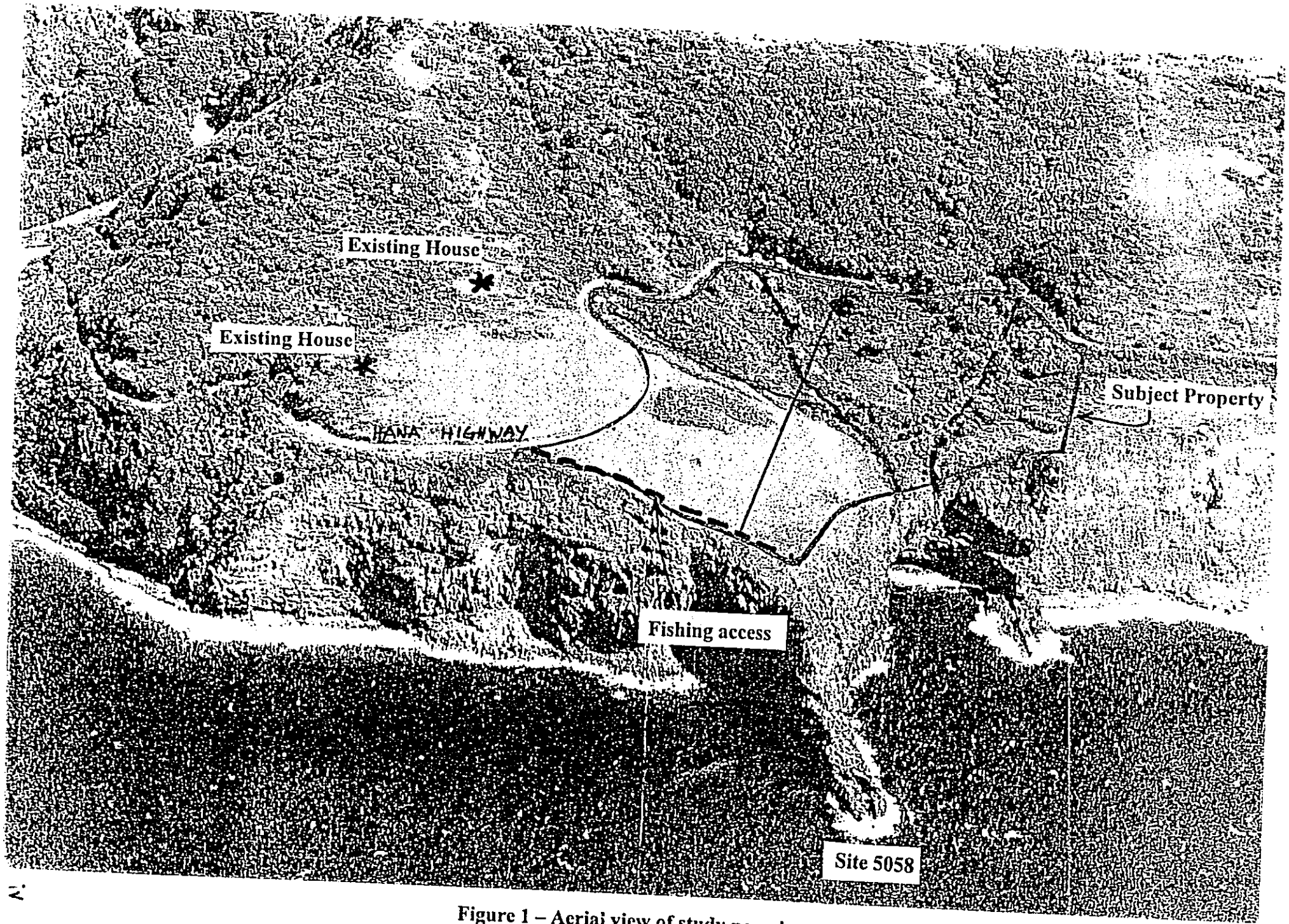

Figure 1 – Aerial view of study parcel.

INTRODUCTION

Mr. Paul Flinn contacted us about this c. 6.5-acre project on the coastline of Kaupo, Maui in the latter part of 2000 (Figure 1; Map 1). At the time, he was planning to erect a field fence along a portion of his property, in order to prevent pigs from entering his property. Erik Fredericksen accompanied Mr. Flinn to the subject parcel to inspect the area that he planned to erect the fence at the toe of a fill area associated with the construction of the Hana Highway. We were subsequently retained to conduct an archaeological inventory survey on the subject parcel, and fieldwork was carried out in late January 2001.

THE STUDY AREA

The project area lies along the Kaupo coast, to the east of Kaupo Gap. Inland (*mauka*)—at about 2600 feet AMSL stands the Kipahulu Forest Reserve. The subject property does not have ready shoreline access due to high (25 to 45 meter) sea cliffs (Figure 1). Elevations on the subject parcel range from 110 ft AMSL to nearly 300 feet AMSL. Three small gullies with intermittent water flows cross the project area. Annual precipitation on this portion of Maui typically ranges from 40 to 60 inches (Juvic and Juvic, 1998). Soil types present on this part of Maui consist of inceptisols. Observed alien plant species on the study area included Christmas Berry (Schinus terebinthifolius), Java Plum (Syzygium cumini), mango (Magnifera indica), papaya (Carica papaya), *koa haole* (Leucaena leucocephala), lantana (Lantana camara), various ferns, grasses, and annual succulent weeds. Native vegetation noted included *hala* ((Pandanus tectorius), *hau* (Hibiscus tiliaceus), *milo* (Thespesia populnea), *Naupaka kahakai* (Scaevola sericea), and *kukui* (Aleurites moluccana).

BACKGROUND INFORMATION

Traditional history

In presenting the traditional history of Kaupo, Elspeth Sterling (1998, p. 171) quotes from "The Story of Kihapiilani" by Moses Manu, the following:

"As they went on, they soon descended to the stream of Manawainui and climbed up the other side, turning to look at the plain of Niniao with Makulau [Mokulau] lying at the shore, the place where Keaka lived when she was associated with Pamano. They went as far as the heiau of Pohoiwi [Popoiwi], the second of the large heiaus in Kaupo [Site 140]. They turned and looked at the pouring forth of the water of Punahoa, and on further passed the place where lay the fireplace of 'Ele'io, one of the swiftest men of that age which has passed.

As they traveled on above Ai-he and descended the pali of Nu'anu'aloa, the kamaaina told the names of the lands of Kaupo. Thus did they go until reaching Naopuu and descended the pali of kalepa. When they arrived below, the kamaaina said to the chief, 'Listen to me travelers.' 'What?' said the chief. 'Here is a road down below at Kahaka and here is a road also which goes up at Nahunonapuu. This is the boundary of Kaupo and Kipahulu.'"

Samuel Kamakau (in Sterling, 1998, p. 172) also comments on events centered in Kaupo:

"Upon Ke-kau-like's return to Maui from his raid upon Kohala he made his home at Kaupo, intending to return to Hawaii and ravage Waipi'o and the Hamakua district. But God ordered it otherwise, for he was seized with a violent illness, or epilepsy, called 'Eyes drawn heavenward' (ka-maka-huki-lani), which defied the skill of doctors. Hence the succession to the land was settled at Mokulau in Kaupo, and Kamehameha-nui, the older brother of Ka-hekili, was made ruler over the land of Maui."

The proximity of the Big Island to this southern coast of Maui, placed Kaupo in a strategic position in the territorial battles between Kahekili, and various Hawaii chiefs, including Kamehameha. Fornander (pp. 150-151) reiterates 2 such battles:

"The Hawaii forces at Hana, apparently under the command of Kalaniopuu in person, had made an incursion or raid in the Kaupo district, which still acknowledged the rule of Kahekili. Taken by surprise and unprepared, the Kaupo people suffered great destruction of property, cruelty, and loss of life at the hands of the Hawaii soldiers; and

the expedition is called in the legends the was of "Kalaehohoa", from the fact that the captives were unmercifully beaten on their heads by the war-clubs of the Hawaii troops."

And another battle (Ibid.):

"When Kahekili heard of this fresh irruption into his domain, he immediately sent two detachments of soldiers, under the command of Kaneolaelae, to the support and relief of the Kaupo people. A sanguinary battle ensued between the Hawaii and Maui forces near the point of land called "Kalaeokailio". Kalaniopuu's army utterly routed and pursued to their fleet, which was lying under lee of the said point of land, and barely a remnant escaped on board and returned to Hana.....

Among the warriors on the Hawaii side in this battle of Kalaeokailio the legends make honourable mention of the valour of Kekuhaupio, whose fame as a warrior chief stood second to none of his time, and of Kamehaameha, afterwards so famous in history, and who on that occasion gallantly supported Kekuhaupio and rescued him from inevitable capture."

Thomas G. Thrum, in his Tales of the Temples (1909, p. 47) discusses the *heiau* of Kaupo:

To Kekaulike, King of Maui, is credited the construction of the prominent heiaus in the Kaupo district, just prior to his raid on Hawaii in the early part of the 18th century, for it is recorded that when Alapai-nui made successful war on other chiefs of Hawaii, judging the time opportune for possible conquest on that island, Kekaulike was building the heiaus of Loaloa and Punaka-a, at Kumunui, and Kanemalohemo, at Popoiwi, after which, gathering his forces together he set sail to harass and burn the Kona coast villages. We find again that these same three temples, with that of Maulili, at Kipahulu, received the solicitous care of Kamehameha upon his touching there with the peleleu fleet in 1802, en route for Kauai, for he rebuilt them all and dedicated them to his war god. Connected with the temple services at this time and place was the ceremony empowering Liholiho with the sacred duties of temple consecration, etc., which public service he first performed at Lahaina, as has been mentioned."

Post-contact Period

With the arrival of missionaries in Maui in the 1830s, came the inevitable changes. In the early part of the 19th century there were sizable populations in Kahikinui and Kanaio, lying to the northwest, and in Kaupo. Establishment of mission schools early on produced 408 "literate individuals" (readers) in Kaupo, 58 in Kahikinui and 282 in Honua'ula, according to a letter written to Rev. R. Anderson by J. Green in December 1833 (Mission Children's Society Collection, Mission Houses Library, Honlulu) [Erkelens, 1996]. Without question, the population figure would have been much larger than the number of "readers" of the language. In Honua'ula, the 1832 missionary census listed the population as 3,340. By 1836 this number had dropped to 1,911 (Ibid.). This population drop was typical of an island-wide pattern, showing declining numbers in remote rural areas, due to disease and migration to commercial centers.

The area of Kaupo District is described by Handy and Handy (1972, p. 113):

"Kaupo, with its land falling away from steep uplands in vast gentle slopes covered with late lave flows, is relatively arid along the seacoast but moderately watered 3 or 4 miles inland where, at an elevation of about 2,000 feet, anything may be grown in the rich volcanic soil. There were a few small terraces in Waiha and Punaluu, above the present homesteads."

They go on further (Ibid., p. 161):

"Kaupo has been famous for its sweet potatoes, both in ancient times and in recent years. Sweet potatoes can be cultivated from sea level up to about 2000 feet in the rich pulverized lava of this district."

Kalepa *ahupua`a* lies at the border between Kipahulu and Kaupo districts. The Kipahulu region is described somewhat differently. Valleys to the east of the study parcel are noted:

"Kukui`ula Stream, where the rugged ridge-and-valley trail to Kaupo begins, watered several small groups of terraces; the small valley of Lolokea once had a few small terraces, no longer cultivated.

In Hanawi there are a few terraces watered by Alelele Stream as it flows down through Hanawi Valley to the sea, which were being replanted in wet taro in 1934. There are a few dry terraces in Kalepa which presumably were used to wet taro in ancient times. Nuanualoa, the last valley before one sights the plains of Kaupo, traveling westward, had a handful of houses with a few cultivated terraces." [Handy and Handy, 1972, p. 507]

The disruption to the landscape, and this way of life by the beginning of cattle ranching was profound. Kaupo Ranch was one of the earliest such establishments on Maui (Bartholomew and Bailey, p. 74), and continues to utilize the land of Kaupo by raising cattle on the dry grassland of the area. The region was not suited to any other commercial uses, such as sugarcane cultivation, which is found to the east. Its only post-contact use has been for livestock grazing. To the east in Kipahulu, sugarcane cultivation became the dominant commercial activity, along with cattle ranching.

Mahele Awards

The tax map indicates that the study parcel is part LCA 4071:1. However, the portion of the Indices of Land Commission Awards dealing with Kaupo, Maui, lists 29 awards—none of which are in Kalepo *ahupua`a* and show this number. The Wai`hona `Aina database does not list this number either, so it is presumed to be in error. In Nuanualoa Gulch, to the west, there are several awards which are shown n the tax map that are identified in the Indices and in the Wai`hona `Aina database. They are: LCA

635B, 1.5 acres to Dr. Baldwin; LCA 8986B, 12.5 acres to Lahaina; LCA 10157B, 6.4 acres to Kekahu; and LCA 542, *apana* 5, to Kekapa.

Claim Number 542

This LCA consisted of 5 *apana*; 3 *kula*, and 1 houselot. *Apana* 5 is shown on the tax map to the northwest of the subject parcel. [Award 542; R.P. 5166...*apana* 5 located in Waipuna Kualaea Kaupo; 2.37 acres]. According to the Native Testimony records (101-102v16)[1]:

"No. 542, Kekapa: Claimant dead, Kalama, his widow is his heir. Kawahaokaia, sworn, knows the claimant's lands....

Section 5:
Mauka by Mountain
Kipahulu by Lahaina's land
Makai by Moku's land
Kahikihui by Kaleowaiha ahupuaa.

Claimant received....section 5 from Keliiahonui in 1843, and lived in peace on these lands till his death in 1848."

Section 5 is identified as "a lot in the ili of Waipuna, in the ahupuaa Pualaea" (N.T. 101-102v16). No date is given when award was granted. No specific land use information on what the lot was used for. Section 1 was a houselot in the village of Popoiui, and Sections 2, 3, and 4 are referred to as "*kula* land" in various *ahupua`a* in Kaupo.

Claim Number 08986B

This claim consists of 12.05 acrea, R.P. 5540 in Kalianu Pualaeu Kaupo, awarded to Lahaina. According to Foreign Testimony records (F.T. 282v6) dated June 28, 1849:
" No. 8986B, Lahaina: Kalikiliki, sworn, I know the ili of Claimant 'Halianu', in Pualaea (Ahu) Kaupo. He has owned it since 1819."

According to Native Testimony records (N.T. 423v5) dated June 27, 1849:

"Kalihilihi, sworn, Kulianu and ili in Pualaea ahupuaa of Kaupo district is Lahaina's land. He had lived there before 1819 at the time of Kamehameha I, without oppositions."

The land use of this land is given as "Olona kihapai or pakanu". [Ibid.]

Olona (Touchardia latifolia) is a plant whose bark was used as a source for strong, durable fiber that was used for fishing and other types of nets, the base for Ti-leaf raincoats and feather capes. The terms *kihapai* and *pakanu* refer to small, cultivated gardens or fields. It is therefore assumed that this land was used for the cultivation of *olona* for use in net making—possibly fish net—given the proximity to the ocean.

[1] As recorded in Wai'hona 'Aina database.

Archaeological Research

Kalepo is the easternmost *ahupua'a* in the Traditional District (*Moku*) of Kaupo (Sterling, p. 166). Background research on previous archaeology for this inventory survey was begun with a perusal of records at the Maui Office of SHPD. The topographic map (Kaupo Quadrangle 16 [Map 4]) shows a number of sites to the west and east, but nothing in the vicinity of Mokuia Point—the location of the present study. It also shows the presence of Kaupo Homesteads in several locations inland (*mauka*). One is in Nuanualoa Gulch which enters the ocean c. 0.5 km. west of Mokuia Point, and another in an unnamed drainage area to the west of Nuanualoa Gulch. The third area of Kaupo Homesteads identified lies inland to the northwest, the bulk of which extends from about 2600 to 1500 feet of elevation. A narrow leg stretches down Maalo Gulch to the ocean at Mokulau Landing. This landing is about 1.5 km. west of the study area.

The first systematic archaeological field survey in this area was the work done by Winslow Walker in 1930 (1931). He located a number of *heiau* along the Kaupo coast of Maui, to the west of the general vicinity of the study parcel—Sites 140 through 146 (See Table 1). Elspeth Stering (1998, p. 171) notes information on another, not mentioned in Walker, but found in the Hawaiian Ethnological Notes [1885]: "Halilio Heiau: Kalepa is the ahupuaa. Halileo was the heiau where human sacrifices were offered. It is not known what chiefs built it nor the kahuna who made it kapu. These are not known." Apparently the location of this structure was not found during Walker's survey, nor during the Statewide Inventory of Historic Places survey in the early 1970s.

Table 1

Site locations shown on portion of Kaupo Quadrangle near the study parcel (Map 4)

SIHP No.	Name	Remarks
140	Keakalauae *Heiau*	Located on hill in Punaho'a valley, overlooking sea at Mokulau. Built by Kekaulike c. 1730. Used as a *Puuhonua* or Hill of Refuge. One of the largest *heiau*.
141	*Heiau* at Paukela	On shore directly south of Loa-loa *heiau*. Associated with Site 528. Hill top with terraced platforms—post-contact burial in lava tube.
142	Lanikaula *Heiau*	Open platform, c. 45 feet square, with 12-foot terrace wall on seaward side.
143	Loa-loa *Heiau*	West side of Manawainui Gulch. Visible from nearly all parts of Kaupo, it is the great *heiau* of the district. A great open platform, with a 30-foot terrace on NE side. Interior extends for 260 feet to a high wall, which extends across the structure—perhaps dividing the secular from the ceremonial area. (See Sterling, p. 174 for a floor plan of this *heiau*)
144	Puumakaa *Heiau*	At Polikua—open platform type with terraces.

145[2]	Haleokane *Heiau*	Kohulau valley—open platform. Credited to the work of Menehunes, who built it in a single night. Said to have been a *heiau* where human sacrifices were made.
146	Lonoaea Heiau	Kohulau valley, 50 yards south of Haleokani. Open platform constructed of rough a'a with high walled enclosure at the rear.
528	Opuluwai Village	Large coastal village—126 hecaters, with 40+ features, including house platforms, enclosures, canoe houses, agricultural terraces and *heiau* (Site 141).
1129	Alelele Terraces	Located in Kaapahu *Ahupua`a*—made up of agricultural terraces on the east side of the stream—used for wet agriculture (SIHP form).
1130	Kalepa shrine	Fishing shrine (*ko`a*) located on precipice above the mouth of Kalepa Gulch (SIHP form).
1492	Lelekea complex	Agricultural complex of possible wet taro terrace, associated with a large *heiau*.
4549	Cattle walls	19th century cattle walls on the makai side of the Hana Highway (Highway 31) identified during road widening in 1996-1997 operations.

More recent archaeological work done along the south coast of Maui has been in connection with the Hawaii Geothermal Project in 1995 (Erkelens); the replacement of Poo`poo Bridge on Route 31 (Burgett, Pantaleo and Sinoto, 1995), and ongoing archaeological investigations in Kahikinui (Kirch and Van Gilder, 1995; Kirch, 1996; Dixon, Conte, Nagahara and Hodgins, 1996 and 1997). All of these studies lie in districts to the west of the present study area.

The latter works have been done within a section of over 2000 acres of DHHL land in Kahikinui. Over 455 archaeological sites have been recorded above the 2100 feet AMSL, which dated to the late precontact period, suggesting that the upland forest periphery of central Kahikinui was probably occupied for only a few generations prior to EuroAmerican contact. The lack of meter-high habitation and garden walls built elsewhere in the area to keep out roaming cattle, suggests that the area was abandoned before these animals had a profound effect on habitation and cultivation (Dixon, et al., 1996). Other findings suggested that the inhabitants of upland areas moved to *makai* to be closer to transportation and commercial routes, i.e. the precontact Pi`ilani and post-contact Hoapili trails (Ibid.).

Settlement Patterns and Expectation of Findings

In other dryer Hawaiian environments, similar to that of Kaupo, traditional cultivation inland was based on a range of dryland crops, with the emphasis on sweet potato production. In such regions at higher elevations, a range of permanent habitation sites have been noted.

[2] Note that the names of this *heiau* and Site 146 are reversed on the SHPD Kaupo Quadrangle, from those in Walker (1931). From Walker's notes, Haleokane *Heiau* is the *mauka* structure.

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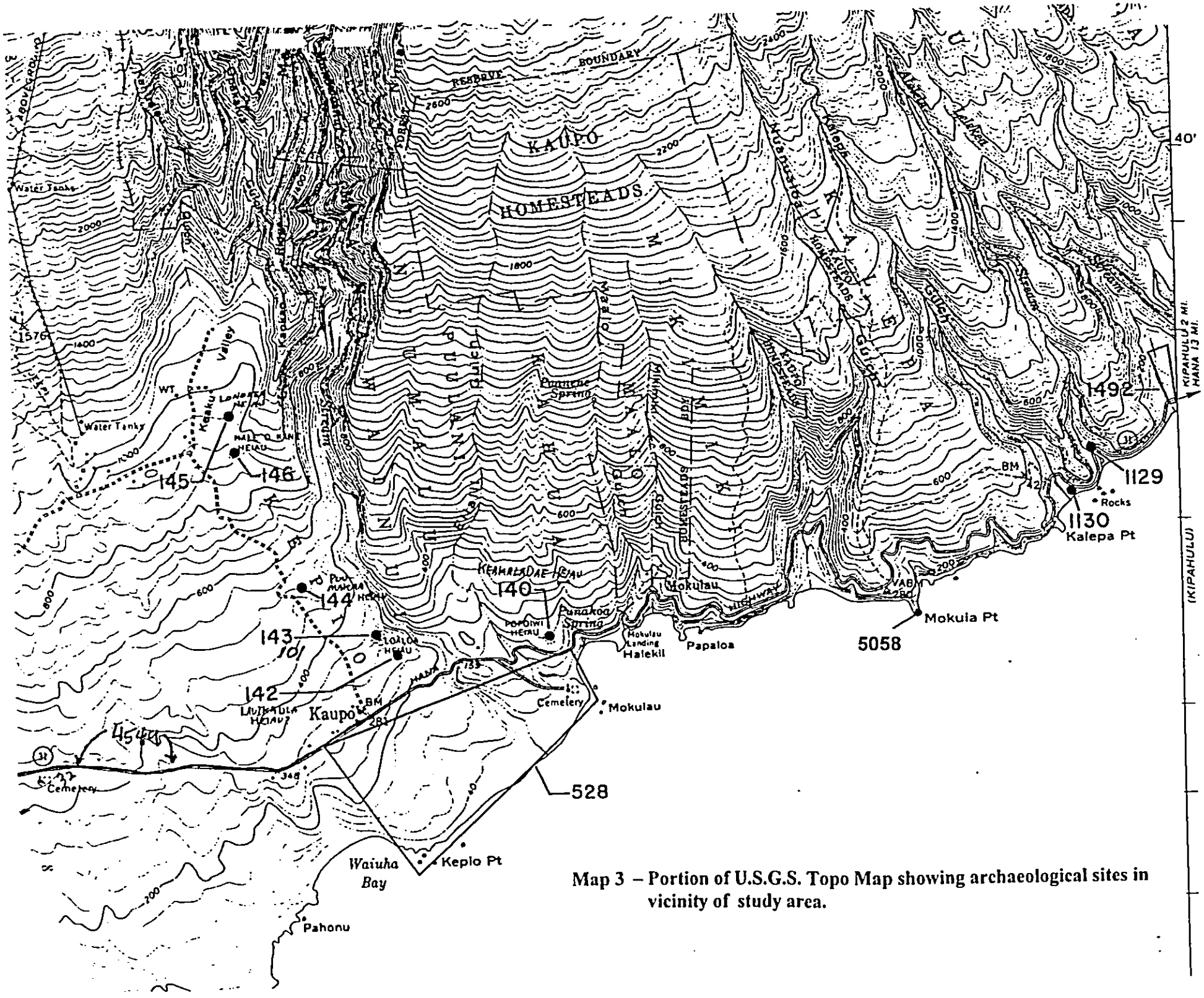

Map 3 – Portion of U.S.G.S. Topo Map showing archaeological sites in vicinity of study area.

Along the coastline, another zone of habitation sites is also present, where harvesting the marine resources, so plentiful on this coast, was a major economic activity. Coupled with this was taro cultivation where sufficient water was available. Trails leading inland connected the *makai* and *mauka* settlements, while those parallel to the shore connected the various *ahupua`a* of the Kaupo district with one another. The most prominent of these latter trails were the Pi`ilani and Hoapili trails—remnants of which are still visible along the south coast of Maui (Burgett et al.1995; Dixon et al. 1996, 1997; Erkelens, 1995).

The present study area lies on the eastern border with Kipahulu, and is slightly wetter than the general Kaupo area. The tax map indicates "Kaupo Taro Lots" about a mile to the west of the study property, in the vicinity of Punahoa Spring, at Mokulau Landing. This microenvironment is however, atypical of the general region. One LCA in Nuanualoa Gulch suggested that this area may have provided *olona* fiber for net making (possibly fish net).

The subject property is on a headland that rises from 100 to 300 feet AMSL. The kinds of sites that we might expect to find at such a location in this section of Maui, would be small agricultural sites, where dry land crops could have been grown. Also, there could be the possibility that such a promontory might be the location of a fish-spotting lookout, with associated *ko`a*, as was found to the east near Kalepa Point (Site 1130). Additionally, there is the possibility that trail segments might be present on this promontory above the ocean.

ARCHAEOLOGICAL METHODS

Our inventory survey consisted of two phases—a pedestrian inspection, and subsurface testing. Pedestrian sweeps were spaced c. 5 meters apart, and visibility tended to be fair. Christmas berry trees and fountain grass cover portions of the subject parcel and visibility was typically fair. Five test units were utilized to sample subsurface conditions on the project area.

All soil from the five manually excavated units was screened through 1/8-inch mesh hardware cloth, and all material culture remains were collected for subsequent analysis. Field notes were kept and photographs were taken with color film. Mapping was carried out with metric survey tapes and hand held compasses. No cultural materials were transported off-island, and standard laboratory methods were used.

Mark Donham and Daniel Vicars carried out the fieldwork on the parcel. Erik Fredericksen was the project director, and Walter and Demaris Fredericksen were senior advisors.

RESULTS

No above ground features were encountered during our surface inspection. However, a utilized basalt flake was found in one of three small gullies present on the project area.[3] Subsequent inspection in the vicinity of this find did not locate a source area for this indigenous artifact. It is interesting to note that visual inspection of the gully bank revealed what appeared to be relatively recent erosive activity. Further evidence of recent erosion was found in the gully to the southeast. An old bulldozed road (c. 30 years old) across the eastern-most gully had essentially been washed away during the course of the last three decades. Given the robust erosive activity in the three gullies located on the parcel, it may be possible that the artifact located in the first gully may have been transported down slope from land *mauka* of the project area. The results of this inventory survey are discussed below.

Surface find

As mentioned above, one indigenous artifact was located during the pedestrian survey. This utilized flake of basalt measures 92 mm in length by a maximum of 82 mm in width by up to 12 mm in thickness. It consists of dark grayish brown (10 YR 4/2) fine-grained basalt. This primary flake contains use ware along portions of two edges (Figure 2).

[3] The smallest gully has been caused by a relatively recently placed (i.e. within the last 20 years) road drainage culvert associated with Hana Highway.

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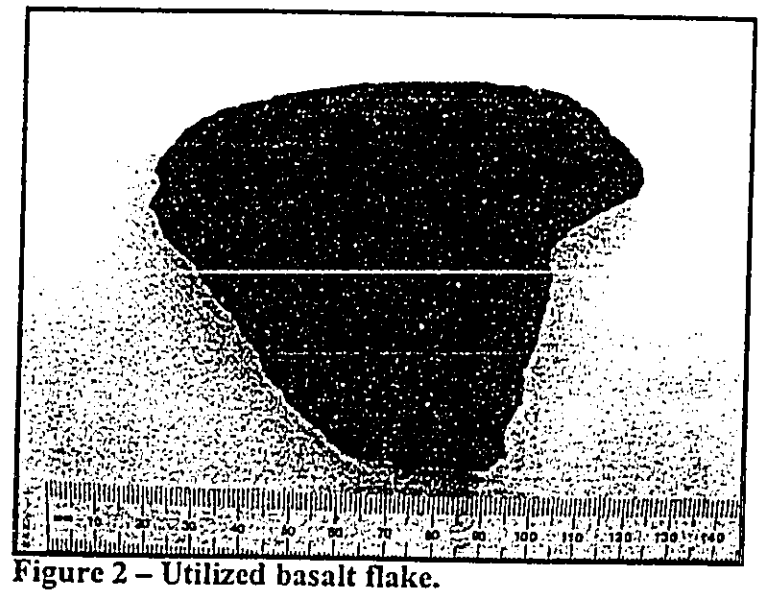

Figure 2 – Utilized basalt flake.

Subsurface investigation

A total of five excavation units were utilized to sample subsurface conditions on the subject parcel (Map 4). Each of these test units is briefly discussed below.

Test Unit 1 (Figure 3)

This 50 by 100 cm test unit was located upslope from the find spot of the artifact in an effort to locate a potential subsurface cultural layer. Test Unit 1 was excavated to a maximum depth of 60 cmbs and it was oriented N-S. A total of three strata were located in the unit before it was abandoned due to very hard subsurface conditions.

Layer I consisted of brown (7.5 YR 4/3) silty clay loam that was up to 17 cm thick. Organic materials and woody roots (*hala*) were common, and no material culture remains were located in this relatively hard stratum. Layer II was composed of brown (7.5 YR 4/4) silty clay. This compact stratum extended from c. 14 to 37 cmbs and it was sterile. Layer III was composed of strong brown (7.5 YR 5/6) clay. This very compact layer was sterile and contained increasing amounts of weathered bedrock with depth. Excavation was halted at 60 cmbs.

Test Units 2 and 3 (Figure 4)

These two 50 by 50 cm units were placed in the vicinity of the planned house site (see Figure 2). TU 3 was placed 5 meters to the east of TU 2. These units were utilized to investigate subsurface conditions on this portion of the parcel. Three soil layers were encountered in both instances before the units were abandoned.

Layer I (0 to 14 cmbs) consisted of brown (7.5 YR 4/4) silty loam with moderate amounts of organic materials and rootlets. One piece of modern bottle glass was located in TU 2 and two pieces of rusted metal were recovered from TU 3. Layer II was made

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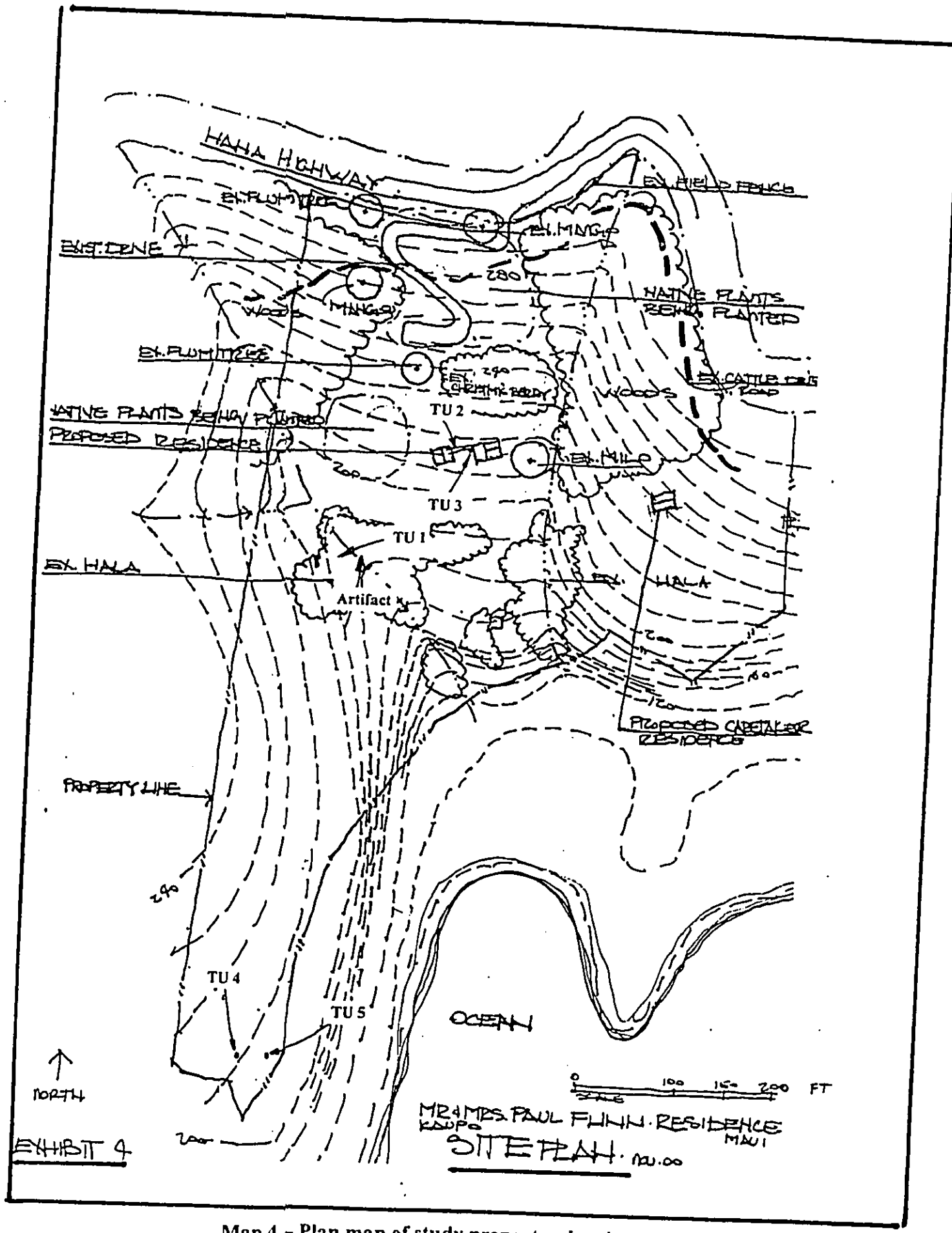

Map 4 – Plan map of study property, showing locations of Test Units and surface artifact find.

up of sterile, brown (7.5 YR 5/4) silty clay. This layer was up to 17 cm thick (to 29 cmbs). Layer III was composed of sterile, strong brown (7.5 YR 4/6). This stratum was encountered at 25 to 29 cmbs and extended to the bottom of excavation in both units at c. 50 cmbs. Test Unit 2 was profiled and serves as a representative profile for TU 3.

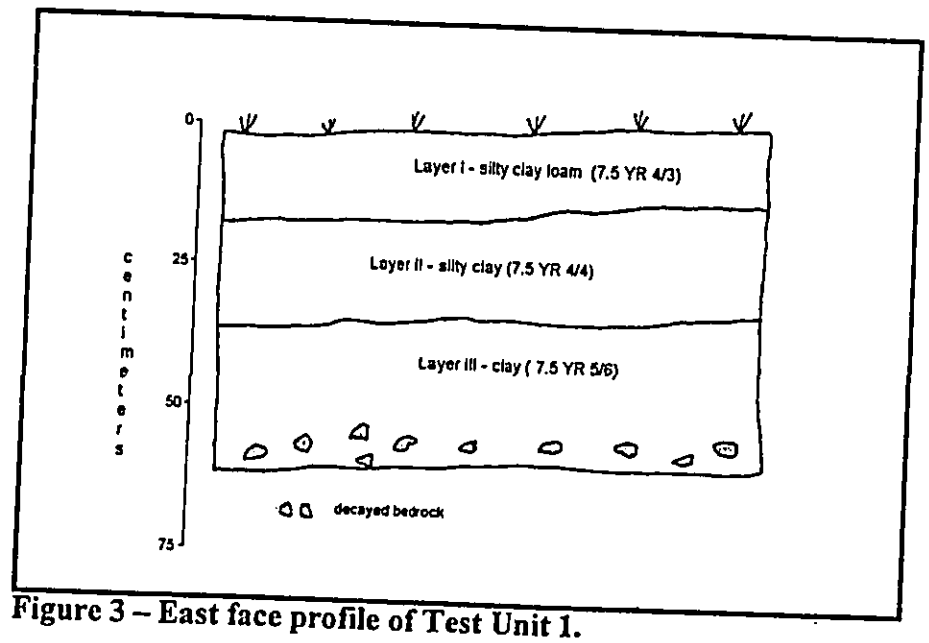

Figure 3 – East face profile of Test Unit 1.

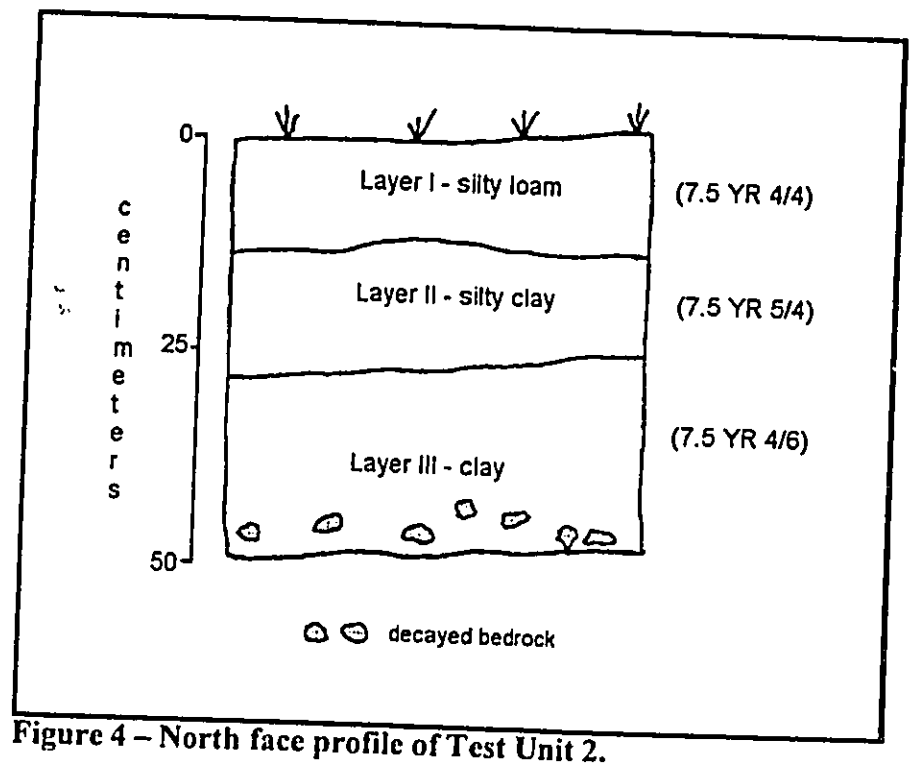

Figure 4 – North face profile of Test Unit 2.

Test Units 4 and 5 (Figure 5)

These two 50 by 50 cm units were excavated on the portion of the Flinn parcel that lies on Mokuia Point. TU 5 was placed 10 meters east of TU 4. As noted earlier in this report, a traditional Hawaiian fishing area (Site 5058) lies on the State portion of this point. The area above Site 5058 was sampled because it was felt that there was a chance that related subsurface material culture remains might be located on this part of the project area. Three relatively rocky strata were encountered on this exposed portion of project area.

Layer I was composed of brown (7.5 YR 5/3) silty loam that contained moderate amounts of organic materials and abundant roots. Two pieces of modern bottle glass and several cigarette filters were found in TU 4 and some rusted metal was located in TU 5 in this c. 15 cm thick stratum. Layer II consisted of brown (7.5 YR 5/4) silty clay. This sterile stratum extended up to 30 cmbs. Layer III was made up of strong brown (7.5 YR 4/6) clay. Both test units were terminated in this sterile stratum at 50 cmbs. Test Unit 4 was recorded and serves as the representative profile for TU 5.

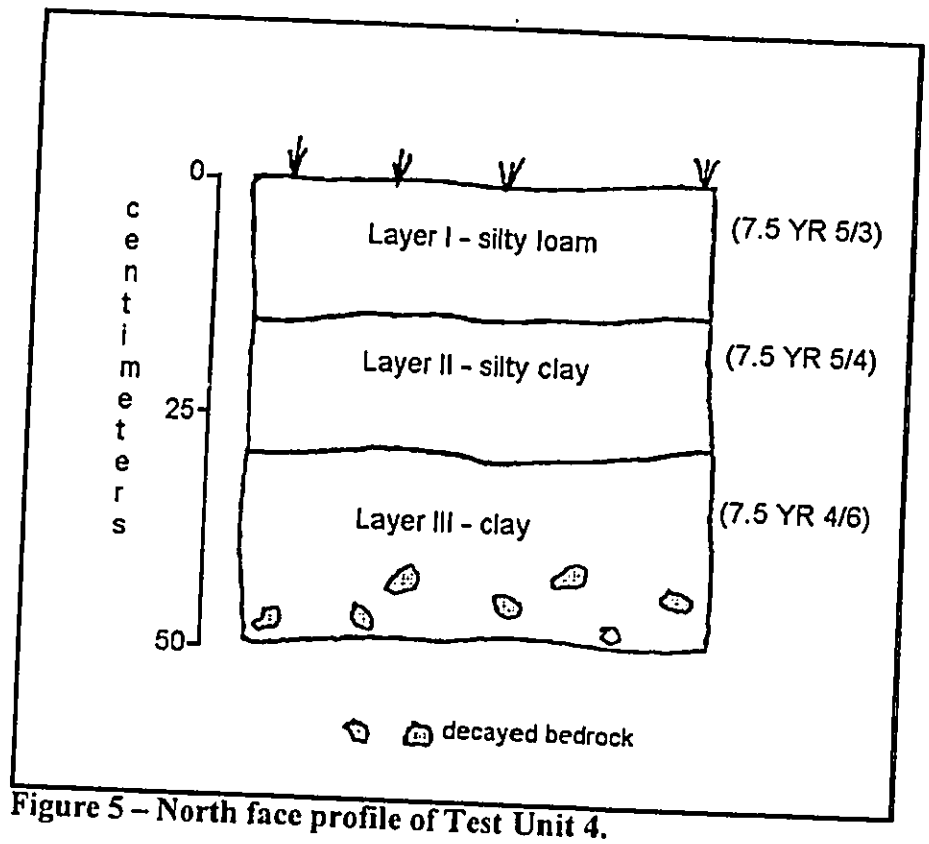

Figure 5 – North face profile of Test Unit 4.

Discussion

Subsurface investigation on the project area did not yield any evidence of significant material culture remains. The only items encountered during this sampling phase of the inventory survey consisted of modern cultural materials.

Site 50-50-16-5058

While there were no significant sites located on the project area, one site was noted on State land on Mokuia Point *makai* (south) of the project area. This site is interpreted as a traditional Hawaiian fishing area. Mokuia Point is the only "safe" ocean access point near the subject parcel. The use of the term "safe" is relative in this case, because access is still somewhat dangerous, because of the relatively steep, eroding slope of the point (Photos 2 and 6; Figure 1). A trail, on State Conservation Land, leads to a series of three wooden ladders that have been placed down the face of this steep incline, and presently afford access to the lower part of the point. A rock overhang shelter c. 2.4 m wide by 1.5 m high by nearly 3 m deep lies near the base of this point.[4] This traditional fishing area has been designated SIHP No. 50-50-16-5058. Since the site lies on State land *makai* (south) of the Flinn parcel, it is included here for informational purposes only. No mapping was carried out because the site is not located on the subject parcel.

SUMMARY AND CONCLUSIONS

In summary, no archaeological sites were located during the course of the inventory survey within the bounds this c. 6.5-acre parcel. One indigenous artifact, a utilized basalt flake, was located. However, no source area could be identified for it. Given the artifact's location in an actively eroding gully, it appears possible that it may have been transported down slope by water over time.

While no sites were identified on the subject parcel, one previously unidentified site was found on the shore of Mokuia Point, on State land at the base of a steep cliff. Access to this site appears to run from Hana Highway, primarily on the adjacent property to the west, at the edge of the sea cliff. It also appears to cross the *makai* border of the Flinn parcel (Figure 1).

[4] This overhang is presently used for shelter by modern fishermen and the point appears to be regularly utilized as a fishing area.

Site Significance Assessment

Site 5058 qualifies for importance under State and Federal historic preservation guidelines—Criterion "d" for its information content and Criterion "e" for its traditional cultural significance.

Mitigation Recommendations

As previously mentioned, this coastal site qualifies for significance under Criterion "d" and Criterion "e". Site 5058 still retains its importance under both significance criteria. While no further archaeological work is recommended for the project area, it is recommended that the owner continue to allow access to Site 5058 across the southwestern portion of his property.

References:

Bartholomew, Gail, and B. Bailey
1994 Maui Remembers: A Local History, Mutual Publishing, Honolulu.

Burgett, B., J. Pantaleo and A. Sinoto
1995 *An Archaeological Inventory Survey for the Proposed PooPoo Bridge Replacement, Manawainui, Hana, Mau (TMK: 1-9-01)*, prepared for Sato and Associates, Inc., Honolulu by Aki Sinoto Consulting, Honolulu.

Dixon, Boyd, P. Conte, V. Nagahara, W. Hodgins
1996 *An Archaeological Inventory Survey Plan for Excavations at Santa Ynez Church and Parsonage, Kahikihui District, Maui, Hawaii.* Prepared by SHPD, Maui Office.

1997 *Upland Forest Periphery Subsistence and Settlement in the Ahupua`a of Kipapa, Nakaohu and Nakaaha: A preliminary Assessment.* In Archaeological Research in Kahikinui, Maui, Hawaii, edited by P. Kirch, University of California Press, Berkeley.

Erkelens, Conrad
1995 *Archaeological Investigation, Cultural Resources Survey, Hawaii Geothermal Project, Makawao and Hana Districts, South Shore of Maui, Hawaii.* Prepared for U.S. Department of Energy, Oak Ridge Operations Office, by International Archaeological Research Institute, Inc., Honolulu.

Fornander, Abraham
1996 Ancient history of the Hawaiian People, reprinted by Mutual Publishing Co., Honolulu.

Handy, E.S. Craighill, and E.G. Handy

1972 Native Planters in Old Hawaii: Their Life, Lore, and Environment, Bishop Museum Press, Honolulu.

Juvic, Sonia P., and Juvic, James O.
1998 Atlas of Hawaii: Third edition. University of Hawaii Press, Honolulu.

Kamakau, S.M.
1992 Ruling Chiefs of Hawaii, Revised Edition, Kamehameha Schools Press,Honolulu.

Kirch, Patrick
1997 *Results of Archaeological Investigations in Kipapa-Nakaoh Area, Kahikinui District, Maui, June-August 1996, and Plans for Continuing Work.* Letter to DHHL, on file at SHPD, Wailuku.

Kirch, P., and C. Van Gilder
1995 *Pre-Contact and Early Historic Cultural Landscapes in Kahikinui District, Maui: A Progress Report,* Hawaiian Archaeology 5:38-52.

Sterling, Elspeth P.
1998 Sites of Maui, Bishop Museum Press, Honolulu.

State Inventory of Historic Places
1973 Various Site Forms

Thrum, Thomas
1907 *Tales of the Temples,* Hawaiian Almanac for 1907, Honolulu.

Walker, Winslow
1931 *Archaeology of Maui,* MS, Maui Historical Society Archives, Wailuku.

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Photo 1 – Looking to the east—Test Unit 4 location, on *makai* part of study parcel.

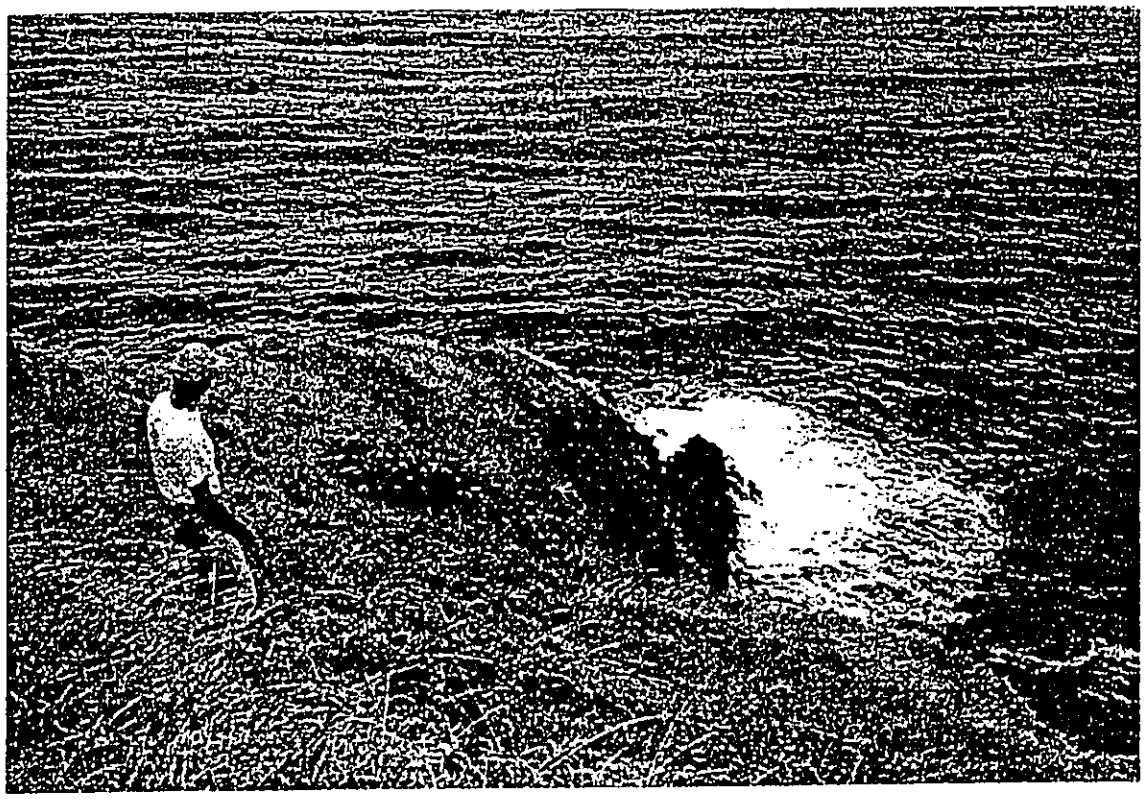

Photo 2 – Looking down on Site 5058—traditional fishing place.

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Photo 3 – *Mauka* section of study parcel—looking north.

Photo 4 – Test Unit 3 location in central part of parcel.

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Kapiioho Lyons Naone Cultural Consulting

Mr. & Mrs. Paul Flinn Residence
Cultural Impact Assessment

P.O. Box 814, Wailuku (Maui), HI 96793 Phone: 808-871-7555; Fax: 808-893-0521

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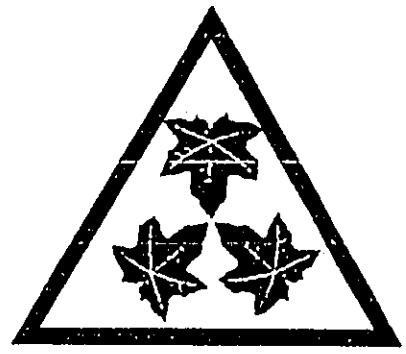

Mr. & Mrs. Paul Flinn Residence Estates
Cultural Impact Assessment

Introduction

The author of this Cultural Impact Assessment Report is Kapiioho Lyons Naone III, a native Hawaiian who was born and raised in the Kipahulu and Hana areas of Maui. Kapiioho has been teaching cultural traditions and language in Maui and internationally for several years and currently holds a position as one of the third highest chiefs of the Royal Order of Kamehameha. This author is familiar with cultural practices and features throughout the Hawaiian Islands. In addition, he has professional and cultural access to other people of similar stature who have specific knowledge of the general Mr. & Mrs. Paul Flinn Residence area.

The methods used to conduct this assessment included: a personal survey which included walking and feeling the property for the proposed Mr. & Mrs. Paul Flinn Residence project as well as review of studies by Xamanek Researches dated February 3, 2001 and June 27, 2000 and a letter from Ho`olawa Farms. In addition, Kahu Naone is a long time resident of Maui and thus, he has personal knowledge of the area and its use because of his familiarity with the area.

Location of Proposed Mr. & Mrs. Paul Flinn Residence Estates

The property is located makai of the Kaupo Homestead Lands and sits above Mokuia Point. It is further identified as TMK: 1-7-01:049 in Kaupo's Ahupua`a Hana District, Island of Maui.

Summary of Interview Results

From a cultural practices and beliefs perspective, the proposed Mr. & Mrs. Paul Flinn Residence project bears no apparent signs of cultural practices or gatherings taking place on the proposed project property either currently or for more than 30 previous years. There is an indication that some people may traverse the most makai edge of the property in order to reach Mokuia Point which has been interpreted as a traditional Hawaiian fishing area according to Mr. Fredericksen of Xamanek Researches.

No architectural features were identified in Kapiioho's walk of the land.

Some indigenous plants such as kukui, hala, and hau are growing on the site and Mr. and Mrs. Flinn have begun eradicating non-indigenous plants and to encourage the growth of those native species which were long ago prevalent in the area.

Methods, Interviews & Related Biographical Information

Mr. Naone went to the land for the proposed Mr. & Mrs. Paul Flinn Residence project and walked it to feel and observe the land and conducted a cultural survey of the entire area. He took a detailed walk through the land and identified no significant sites on the property. His tour of the property was consistent with the findings of Xamanek Researches noted earlier in this report.

Constraints

There were no constraints. Due to Mr. Naone's own knowledge of the area, he believes that the reports provided to date provide definitive testimony about area cultural beliefs and practices for the property.

Cultural Resources, Practices and Beliefs

Based on Mr. Naone's time spent on the Mr. & Mrs. Paul Flinn Residence project site; and based on the findings of the Xamanek Researches group, Mr. Naone feels he can state that for the past 30 years at least, there have been no significant cultural practices or beliefs associated with this particular property. He also believes there are no cultural resources that will be affected by the proposed project.

Confidential Information

No documentation is being presented separately from this report. All information was shared freely and willingly.

Conflicts

There are no known conflicts or unresolved issues regarding this assessment.

Analysis/Recommendations

1. Archaeological monitoring is recommended during all ground-disturbing activities and a cultural specialist should be called to assist the developer should any skeletal remains or any artifacts be found.

2. The cultural specialist and/or the developer should contact the State Historic Preservation Division of the Department of Land and Natural Resources for the State of Hawaii and the Maui Burial Council immediately if any remains or artifacts are found.

3. If remains or artifacts are found, such skeletal remains and/or any artifacts should be temporarily stored and then reinterred at one ceremony near the time of project completion.

4. A place for reinternment should be designated although it appears that such a need is highly unlikely.

5. A cultural specialist should perform an appropriate Hawaiian cultural blessing ceremony of the area once the building is done.

Bibliography

Maps provided by Mr. and Mrs. Paul Flinn as follows: Mr. & Mrs. Paul Flinn Residence topographical map; Mr. & Mrs. Paul Flinn Residence Aerial Photograph from the 70's; and Figure 1: Project area, including location of Site 50-50-16-5058 on State Land that is part of the Xamanek Researches report dated February 3, 2001.

Xamanek Researches Field Work Summary Letter Report dated February 3, 2001.

Xamanek Researches Letter Report on an Archaeological Site Inspection of subject property, dated June 27, 2000.

Ho`olawa Farms letter dated January 5, 2001.

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Ho'olawa Farms

A Native Plant Nursery

January 5, 2001

To Whom It May Concern:

Paul and Sally Ann has spent much time removing alien, introduced plants on their property in Kaupo and replacing them with native Hawaiian and Polynesian plants.

The alien, invasive plants that they have removed include: christmas berry (Schinus terebinthifolius); gauva (Psidium guajava); java plum (Syzygium cumini) and mango (Mangifera indica).

Native and Polynesian plants that they have planted include: Ilie'e (Plumbago zeylanica); Pa'uohu'aka (Jacquemontia ovalifolia); Ahinahina (Artemisia australis); Akia (Wikstoemia uvi-ursi); Ko'oko'olau (Bidens mauiensis); Alahe'e (Canthium odoratum); Iliahi (Santalum ellipticum); Loulu (Pritchardia arecina); and Milo (Thespesia populnea) to name a few.

Basically, they are recreating what used to be there many years ago, creating a diverse habitat that will enhance and preserve a special area of Maui.

Sincerely,

Anna Palomino

Anna Palomino
Owner, Ho'olawa Farms

P.O. Box 731 • Haiku • Hawaii 96708 • (808) 575-5099 • (808) 893-7565
Fax (808) 575-5099 • Email hoolawa@eastmaui.net

BOTANICAL SURVEY OF LOT LOCATED AT KAUPO, MAUI
T.M.K. 2-1-7-01:49

January 5, 2001

For:
Paul Flinn and Sally Ann Taylor

By:
Anna Palomino
Ho'olawa Farms
P.O. Box 731
Haiku, HI 96708

Survey Method

A walk-through (pedestrian) method was used. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

Description of the Vegetation

Coastal vegetation occurs along the seaward front of this makai parcel. The coastal vegetation consists of low, scattered mats of nanea (Vigna marina), mau'u'aki'aki (Fimbristylis cymosa) and numerous sprawling shrubs of naupaka kahakai (Scaevola sericea). Numerous trees of hala (Pandanus tectorius) are found uphill above this coastal area.

Towards the mauka end of the property is a thick cover of christmas berry (Schinus terebinthifolius) and mango (Mangifera indica), scattered throughout these trees are numerous vervain (Stachytarpheta jamaicensis), vines of mauna loa (Canavalia cathartica), and numerous hala (Pandanus tectorius).

Summary

Of the 34 plant species inventoried on the Kaupo lot, 17 are introduced or alien species; 8 are originally of Polynesian introduction; and 9 are native. The native plants encountered are indigenous and endemic species. No plant species were encountered during the survey are listed as endangered by the U.S. Fish and Wildlife Service.

LIST OF VASCULAR PLANT SPECIES ENCOUNTERED AT KAUPO, MAUI
DECEMBER 26, 2000

SCIENTIFIC NAME (Latin names underlined; Hawaiian names in italics)	HAWAIIAN OR COMMON NAME	STATUS
MONOCOTYLEDONES (monocots):		
Agavaceae		
Cordyline fruticosa	*Ti*	polynesian intro.
Araceae		
Cocos nucifera	*Niu, coconut*	polynesian intro.
Commelinaceae		
Commelina benghalensis	*Honohono*	non-native
Cyperaceae (sedges)		
Fimbristylis cymosa	*Mau'u'aki'aki*	indigenous
Mariscus phleoides		endemic
Poacaceae (grasses)		
Panicum maximum	*Guinea grass*	non-native
Pandanaceae		
Pandanus tectorius	*Hala*	indigenous
DICOTYLEDONES (dicots)		
Anacardiaceae		
Mangifera indica	*Mango*	non-native
Schinus terebinthifolius	*Christmas berry*	non-native
Asteraceae		
Ageratum conyzoides	*Maile honohono*	non-native
Caricaceae		
Carica papaya	*Papaya*	non-native
Clusiaceae		
Calophyllum inophylum	*Kamani*	polynesian intro.
Combretaceae		
Terminalia catappa	*Kamani haole*	non-native
Convolvulaceae		
Ipomoea violacea	*Koali, morning glory*	non-native

Ebenaceae		
Diospyros sandwicensis	*Lama*	endemic
Euphorbiaceae		
Aleurites moluccana	*Kukui*	polynesian intro.
Chamaesyce		
Chamaesyce celastroides	*'Akoko*	endemic
Fabaceae		
Canavalia cathartica	*Maunaloa*	non-native
Leucaena leucocephala	*Koa haole*	non-native
Senna surattensis	*Kolomona*	non-native
Vigna marina	*Nanea*	indigenous
Goodeniaceae		
Scaevola sericea	*Naupaka kahakai*	indigenous
Malvaceae		
Hibiscus tiliaceus	*Hau*	polynesian intro.
Thespesia populnea	*Milo*	polynesian intro.
Moraceae		
Artocarpus communis	*Ulu, breadfruit*	polynesian intro.
Myrtaceae		
Syzygium cumini	*Java plum*	non-native
Psidium guajava	*Guava*	non-native
Passifloraceae		
Passiflora eduljs	*Liliko'i*	non-native
Plantaginaceae		
Plantago major	*Laukahi*	non-native
Rosaceae		
Osteomeles anthyllidifolia	*U'ulei*	indigenous
Rubiaceae		
Morinda citrifolia	*Noni*	polynesian intro.
Scrophulariaceae		
Bacopa monnieri	*'Ae'ae*	indigenous
Verbenaceae		
Stachytarpheta jamaicensis	*Jamaica vervain*	non-native

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Family Residence. without
it qualifies that per PAUL
FLINN

COUNTY OF MAUI
DEPT. OF PLANNING
2001 APR 18 PM 2:41

DEPARTMENT OF PLANNING

SPECIAL MANAGEMENT AREA ASSESSMENT/EXEMPTION FORM (SM5)

APPLICANT: Please complete this section. Attach completed and signed Zoning and Flood Confirmation Request Form and *one (1) set of site and building plans*. PLEASE TYPE OR PRINT LEGIBLY.

PROJECT NAME: PAUL & SYLVANN FLINN RESIDENCE DATE: Ap. 16.01

PROJECT ADDRESS/LOCATION: KAUPO MAUI

TAX MAP KEY NUMBER(S): 1-7-1:49 LAND AREA: TOTAL 6.7 / 0.5

APPLICANT'S NAME:(PRINT) PAUL FLINN PHONE NO. 242-1955

APPLICANT'S SIGNATURE: Paul Flinn ADDRESS 1310 Piiholo RD
MAKAWAO HI 96768

EXISTING AND PROPOSED DEVELOPMENT: CONSTRUCTION SINGLE FAMILY Residence + improvements, Planting, fencing, caretaker

CHECK ALL THAT APPLIES: Building Permit Application no. NA

☒ Property is located on the shoreline ☐ Development is or may become part of a larger development
STATE LAND THEN USE

DEPARTMENT USE ONLY

Development does not include the following, provided that whenever the authority finds that any excluded use, activity, or operation is or may become part of a larger project the cumulative impact of which may have a significant environmental or ecological effect on a special management area, that use, activity, or operation shall be defined as "development" for the purpose of this part:

Y 1. Construction of a single family residence that is not part of a larger development.
2. Repair or maintenance of roads and highways within existing rights of ways.
3. Routine maintenance dredging of existing streams, channels, and drainage ways.
4. Repair and maintenance of underground utility lines, including but not limited to water, sewer, power, and telephone and minor appurtenant structures such as pad mounted transformers and sewer pump stations.
5. Zoning variances, except for height, density, parking, and shoreline setback.
6. Repair, maintenance, or interior alterations to existing structures.
7. Demolition or removal of structures, except those structures located on any historic site as designated in national or state registers.
8. Use of any land for the purpose of cultivating, planting, growing, and harvesting plants, crops, trees, and other agricultural, horticultural, or forestry products or animal husbandry or aquaculture or mariculture of plants or animals, or other agricultural purposes.
9. Transfer of title of land.
10. Creation or termination of easements, covenants, or other rights in structures or land.
11. Subdivision of land into lots greater than twenty acres in size.
12. Subdivision of a parcel of land into four or fewer parcels when no associated construction activities are proposed; provided that any land which is so subdivided shall not thereafter qualify for this exception with respect to any subsequent subdivision of any of the resulting parcels.
13. Installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors.
14. Structural and nonstructural improvements to existing single-family residences, including additional dwelling units, where otherwise permissible, and
15. Nonstructural improvements to existing commercial structures.

☐ More information required. See attached assessment application.

Comments/Remarks:

Reviewed by: MAA (Planner's Initial) Date: 4/26/01 Permit No: 2001/0152

☒ Pursuant to Section 22, Chapter 205A, Hawaii Revised Statutes, as amended, and the rules of the Planning Commissions in Maui County, the proposed development is exempt from the Special Management Area.

Approved by: (Signature) JOHN E. MIN, DIRECTOR Date: 4/26/01

File: SM5, CZM-SM5, OSP, Planning Division, Zoning Enforcement and Administration Division (2)

S:\ALL\FORMS\ExemptSM5.wpd12/00

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
PLANNING DIVISION (808) 270-7735; ZONING DIVISION (808) 270-7253; FACSIMILE (808) 270-7634

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COUNTY OF MAUI
DEPARTMENT OF PLANNING

ZONING AND FLOOD CONFIRMATION REQUEST FORM

APPLICANT: _____ PHONE NO.: _____

ADDRESS: _____

PROJECT NAME: _____

ADDRESS AND/OR LOCATION: _____

TMK NUMBER(S): 1-7-001:049

ZONING INFORMATION

STATE LAND USE Conservation COMMUNITY PLAN Conservation

COUNTY ZONING none

FLOOD INFORMATION

FLOOD HAZARD AREA* ZONE C

BASE FLOOD ELEVATION _____ mean sea level, 1929 National Geodetic Vertical Datum or for Flood Zone AO, FLOOD DEPTH _____ feet.

FLOODWAY [ ] Yes or [X] No

FLOOD DEVELOPMENT PERMIT IS REQUIRED [ ] Yes or [X] No

* For flood hazard area zones B or C; a flood development permit would be required if any work is done in any drainage facility or stream area that would reduce the capacity of the drainage facility, river, or stream, or adversely affect downstream property.

****

FOR COUNTY USE ONLY

REMARKS/COMMENTS: _____

- ☐ Additional information required.
- ☐ Information submitted is correct.
- ☐ Correction has been made and initialed.

Reviewed and Confirmed by:

Signature
Zoning Administration and Enforcement Division

4/26/01
Date

S:\ALL\FORMS\FLDZNING.REQ8/15/12/00

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
PLANNING DIVISION (808) 270-7735; ZONING DIVISION (808) 270-7253; FACSIMILE (808) 270-7634

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MODEL SELECTION

This **selection guide** is designed to help you pick the **best model** *for your needs*. The **basic decision** is whether to install a **self contained toilet** or a **central composting unit**. In either case, *non-electric models* are available for those who do not have a *continuous 110 Volt power supply*.

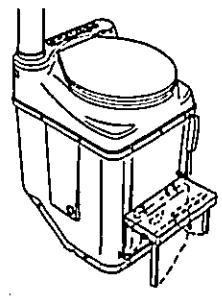
SELF CONTAINED UNITS

- Require **no plumbing or water connection**, and are quick and simple to install.
- Are more **suited for winter operation** than central units, because it is often easier to keep the bathroom warm.
- Most (especially electric units) **can evaporate all liquids**, so *approvals are not normally required*.
- Are available with different capacities. "SUN-MAR" recommends that you pick a unit with a capacity greater than you really need.

CENTRAL COMPOSTING SYSTEMS

- Are ideal for those who want a **flush toilet in the bathroom**, or who want to *connect more than one toilet* to the composting unit.
- Are normally placed **under, or outside the bathroom**, with 3" plumbing pipe connecting the unit to a *1 pint flush toilet* (purchased separately). If possible, the central composting unit should be within 20 feet of the toilet.
- Are often unable to evaporate all the flushing liquid. This excess should be collected or drained into an approved facility.

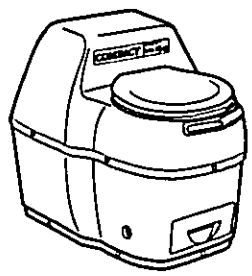
ELECTRICAL MODELS (For those with a continuous supply of 110 Volt power available)



"ECOLET"

Unit designed primarily for **Marine/RV** use, this three chamber toilet with Bio-drum is available with 110 Volt fan and heater for use where space is very limited. **19 ½" Wide, 21 ½" Long.**

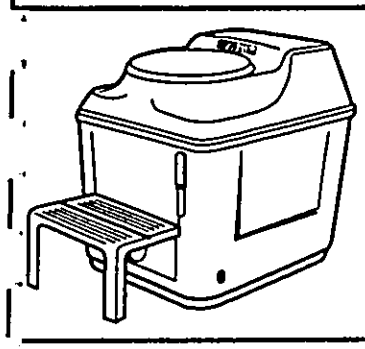
Capacity (People)
Weekend & vacation 3-5
Residential/continuous 1-2



"COMPACT"

Elegant, medium capacity unit with the looks to complement any bathroom. Incorporates standard three chambers with **patented** variable diameter, insulated Bio-drum.

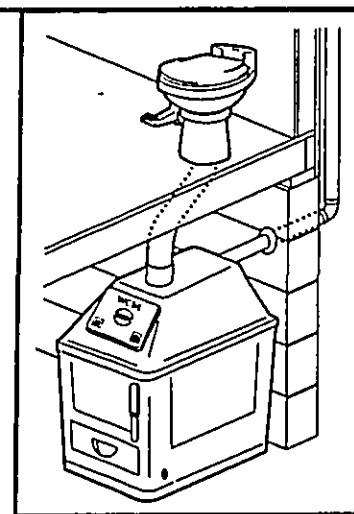
Capacity (People)
Weekend and vacation 3-5
Residential/continuous 1-2



"EXCEL"

High capacity three chamber unit. Large insulated Bio-drum gives this unit the capacity to handle virtually any domestic need. *Tested by N.S.F. at 4 adults in continuous use.*

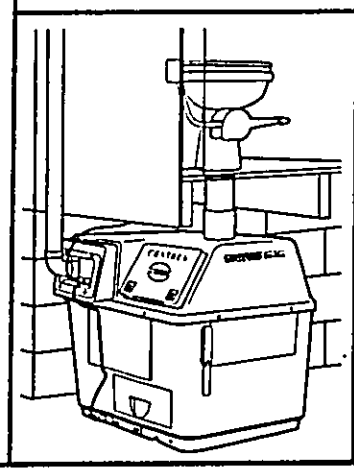
Capacity (People)
Weekend & vacation 6-8
Residential/continuous 3-5



"WCM"

High capacity three chamber unit with large insulated Bio-drum. *Long narrow shape* with *rear venting* and drain makes *it the ideal unit for placing in a* basement or between beams.

Capacity (People)
Weekend & vacation 7-9
Residential/continuous 4-6
(4 adults or a family of 6)

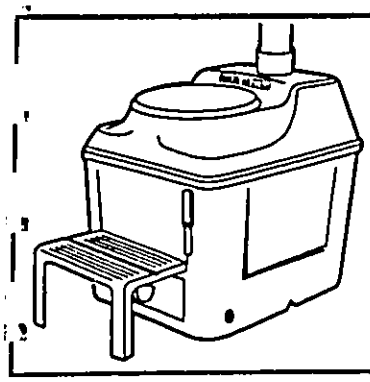


"CENTREX"

High capacity three chamber unit with large insulated *Bio-drum mounted transversely*. **Vented and fully serviceable from the front** and only 27½" high, this unit is ideal for placing under or to the side of a building.

Capacity (People)
Weekend & vacation 7-9
Residential/continuous 4-6
(4 adults or a family of 6)

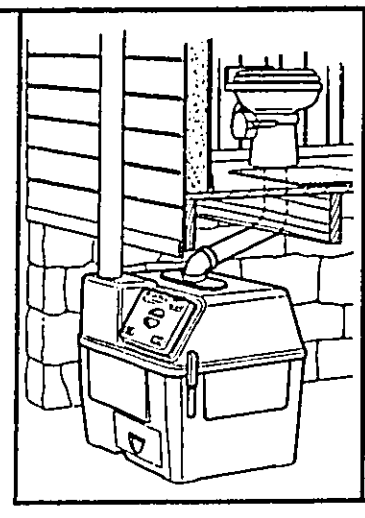
NON ELECTRIC UNITS (For those who *do not* have a continuous supply of 110 Volt power)



"EXCEL N.E."

Non-electric version of the EXCEL. Has the same three chambers with large insulated Bio-drum, but has a **4" vent** exiting from the top rear of the unit. A 12 Volt fan is recommended for residential or heavy use.

Capacity (People)
Weekend & vacation 5-7
Residential/continuous 2-3



"CENTREX N.E."

Non-electric version of the CENTREX. Has the same three chambers and Bio-drum, but is fitted with a **4" vent** exiting from the front of the unit. A 12 Volt fan is recommended for residential or heavy use.

Capacity (People)
Weekend & vacation 6-8
Residential/continuous 3-4
(3 adults or a family of 4)

OTHER UNITS AVAILABLE

"EXCEL AC/DC" and **"CENTREX AC/DC"**
These AC/DC units are fitted with **dual vent stacks** (2" and 4"). They are ideal for those with **generators and solar panels.** (See pages 5 & 9)

CENTREX AIR FLOW" and **"CENTREX N.E. AIR FLOW"**
These units are **waterless versions** of standard electric and non electric CENTREX models. They use a **"Sun-Mar Dry Toilet"** (purchased separately) which is mounted **directly above the composting unit**, and *connected to it* by a 10" diam. **"pipe piece"**. These come in 31½" sections, and can be cut to size.

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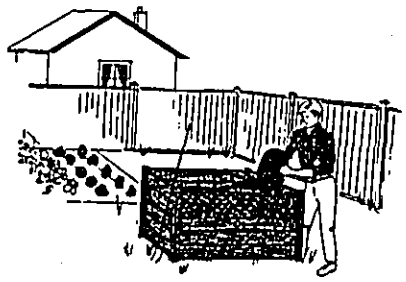
SUN-MAR

COMPOSTING TOILETS

"Sun-Mar" composting toilets have become **the solution of choice** for cottages, cabins, or camps; for remote work places; or simply for those who know that *recycling* waste is the right thing to do!
Wherever there is a **poorly working septic system,** a "Sun-Mar" can take care of the toilet waste; where there is an **outhouse,** we offer the luxury of an *indoor facility;* and where there is **no toilet at all,** a "Sun-Mar" provides the right environmental choice.

THE ENVIRONMENTAL SOLUTION

"Sun-Mar" composting toilets use the natural processes of decomposition and evaporation to **recycle human wastes.** They are quick to install, easy to use, and most models require no water supply or sewer lines. Waste entering the toilet is over **90% water content,** and this is evaporated, and carried back to the atmosphere through the vent system. The small amount of remaining material is converted to fertilizing soil by **natural decomposition.**



By recycling in this way, NO Septic Systems, NO Holding Tanks, and NO Chemicals are needed to handle toilet wastes.

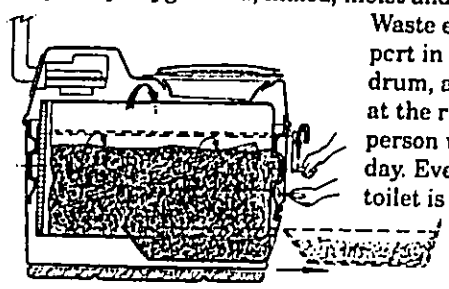
SUN-MAR'S THREE-CHAMBER SYSTEM

A composting toilet system has **three separate tasks** to perform, each of which requires a separate chamber:-

- waste and toilet paper have to be composted **quickly and odorlessly**
- finished compost must be **safe** and easy to handle
- liquid must be **evaporated**

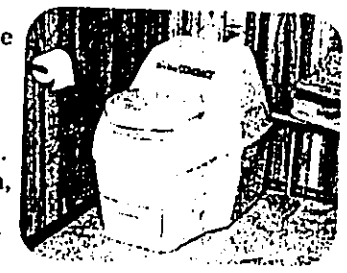
The Composting Chamber

"Sun-Mar" engineers found that the ideal conditions for *fast, odorless* composting could only be provided in a **rotating drum,** (we call it the Bio-drum), where the compost can be kept completely oxygenated, mixed, moist and warm.



Waste enters through an entry port in the top of the Bio-drum, and peat mix is added at the rate of one cupful per person using the toilet per day. Every third day while the toilet is in use, (or at the end of the weekend) the Bio-drum should be rotated by turning the drum handle on the front of the unit.
This tumbles the compost to ensure it is **completely mixed** and **oxygenated.** A drum door closes automatically to keep the waste inside as the drum rotates.

To prevent the compost from getting saturated, a **screen** at the rear of the drum filters any excess liquid directly into the **evaporating chamber.**
When the drum gets 2/3 full, some compost is *extracted* into the finishing drawer. This is done simply by pulling the drum lock, and rotating the drum backwards. Now, the drum door remains open, and compost falls into the second chamber, *the* ***compost finishing*** **drawer.**

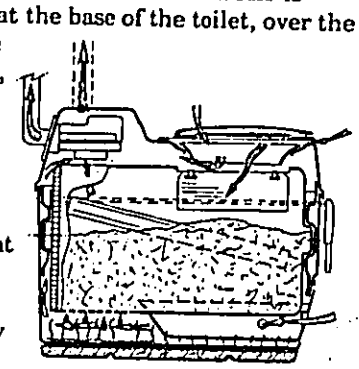


The Compost Finishing Drawer

Compost in this pull-out finishing drawer is **totally isolated** from material in the Bio-drum, and is no longer subject to contamination from fresh waste. It is here that the composting and sanitation processes are completed, and the compost becomes **safe to handle.**
The sanitized compost in the drawer can be *emptied* whenever it is necessary to extract more compost from the drum.

The Evaporating Chamber

The **third chamber,** the base of the toilet, is the evaporating surface from where any *excess liquids,* which cannot be absorbed by the compost, are evaporated or drained. **Air** is drawn in through intake holes at the base of the toilet, over the evaporating surface, and up the **vent stack.** On electric models, air is drawn in by a fan, while non electric models use *natural draft* induced by the chimney effect of a 4" vent stack.
In both cases, a partial vacuum is maintained which ensures that **no odors** can escape.
Evaporation is assisted on electric models by a thermostatically controlled **heating element** in a sealed compartment underneath the evaporating chamber. This heater keeps the floor of the chamber hand warm.



All models are fitted with a **safety drain** for connection to a drain pit or other approved facility. Use of this drain connection is *optional* on self contained electric units, but *required* on others.

Ask for
• 12 Page Color Catalog • 27 Minute Video

25 YEAR WARRANTY

All "SUN-MAR" units carry a *Comprehensive 3 YEAR parts replacement warranty,* with a full 25 YEAR replacement warranty on the fibreglass body.

Distributed by:
SOLO POWER
SOLAR ELECTRIC SYSTEMS
1-800-279-7656
1011A Sawmill Rd. NW
Albuquerque, NM 87125
Phone: 505-242-8340 Fax: 505-243-5187

Published by SUN-MAR Corp. U.S.A. 600 Main St., Tonawanda, N.Y. 14150-0888 Cda. 5035 N. Service Rd., C9, Burlington, Ont. L7L 5V2 Tel: (905) 332-1314 Fax: (905) 332-1315 Email: compost@sun-mar.com

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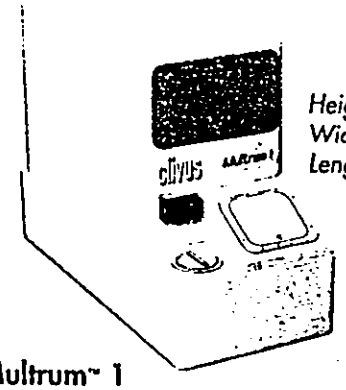
CLIVUS COMPOSTERS

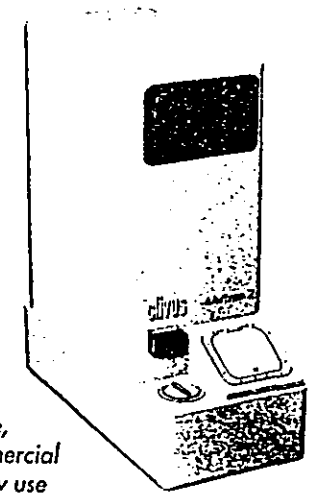
Clivus offers a complete range of composters — from the compact cottage unit to the largest capacity system that can handle over 65,000 uses per year. Our composters are made of 100% recyclable plastic and all are compatible with waterless and ultra-low flush toilets. All are **true composters** and all can have built-in liquid fertilizer storage directly under them. The liquid storage chamber has a port which can be equipped with an electric or manual pump to conveniently assist the recycling of this high-quality, odor-free fertilizer.



Height: 56"/142.3 cm
Width: 33"/83.9cm
Length: 65"/165.1cm

The Multrum™ 1
This unit is designed for seasonal use in cabins, camps, and cottages. It is easy to install in an existing crawl space or in a shallow excavation under the structure.

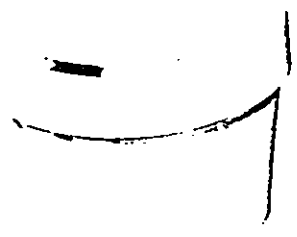
Height: 66"/167.7cm
Width: 33"/83.8cm
Length: 65"/165.1cm



The Multrum™ 2
Suited to higher seasonal use, small residences, small commercial establishments, and some low use public facilities.

The Multrum™ 10, 20 and 30 Series: *These larger composters are designed for high volume use and are best suited to public facilities such as highway washrooms, parks, and resorts. They are also well suited to residences, schools, community centers, libraries, clinics, restaurants and new construction office buildings.*

CLIVUS FIXTURES



CM Waterless Toilet
This Clivus-designed waterless toilet is the simplest of all to use and maintain. The constant draft down the toilet whenever the lid is open functions as a ventilator for the bathroom keeping it odor-free at all times.

Ultra-low Flush Toilets
We have two ultra-low flush toilet fixtures: a one pint (1/2 liter) flush toilet and a 3 oz. foam toilet. These are especially convenient for retrofit situations where the composter must be offset from the bathroom. In multi-storey buildings with more than one toilet, it is often an advantage to have a waterless toilet on the ground floor and an ultra-low flush one upstairs.

Urinals
We recommend the use of urinals as sanitary conveniences in homes as well as in commercial/institutional facilities. There are three models available, all completely odorless.

- *Clivus-designed flushless model*
- *standard porcelain model*
- *stainless steel model appropriate for cabins as well as remote public facilities.*

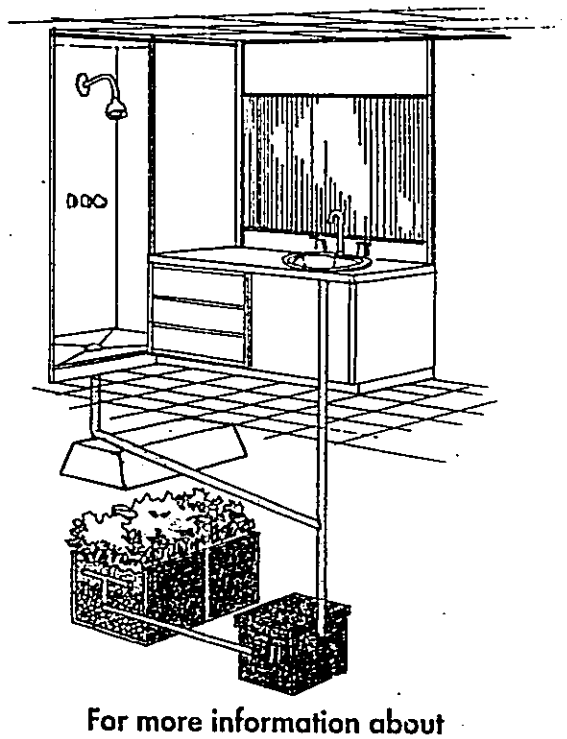
CLIVUS GREYWATER PURIFICATION

What is Greywater?

Greywater is **washwater**. That is, "waste" water from all fixtures and appliances except toilets and garbage disposals. Greywater sources include showers, tubs, dishwashers, laundry machines and sinks. Although greywater represents about 60% of the total wastewater of a conventionally plumbed home, its characteristics are very different from combined sewage. The importance of this difference is that separated greywater processing permits for easier recovery and re-use of this valuable irrigation/fertilization resource.

Clivus offers complete Greywater Purification™ solutions, including greywater roughing filters and custom site designs for indoor and outdoor soil/planting beds.

Clivus greywater filter and indoor soilbed/planter.



For more information about Clivus Greywater Purification™ Systems call: 1-800-4CLIVUS

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PACKAGED SYSTEM KITS

Q. How much PV do I need for my house?

How much PV you need depends on your power loads and their duty cycles. If you wanted to completely replace your current electrical purchases from the utility with a PV system, you could look at your kWh usage on your electric bills for a year, calculate a daily average, and divide that by the number of average daily sun hours for your location. (3600 kWh/yr divided by 365 days/yr equals approximately 10 kWh/day, divided by 5 sun-hours per day (for locations in middle America), equals 2 kW. This would indicate that a 2-kW system would, over the course of an average year, produce enough energy to replace the power you are currently using.

However, if you design an energy efficient home, you could cut the annual electricity usage dramatically, reducing the size of the system. In the real world, the majority of home systems range from 1 kW to 2 kW. Where you live, if you are on the grid or off, and how you live, will dictate the size of your system, and its ultimate cost and value.

Q. How long will PV last?

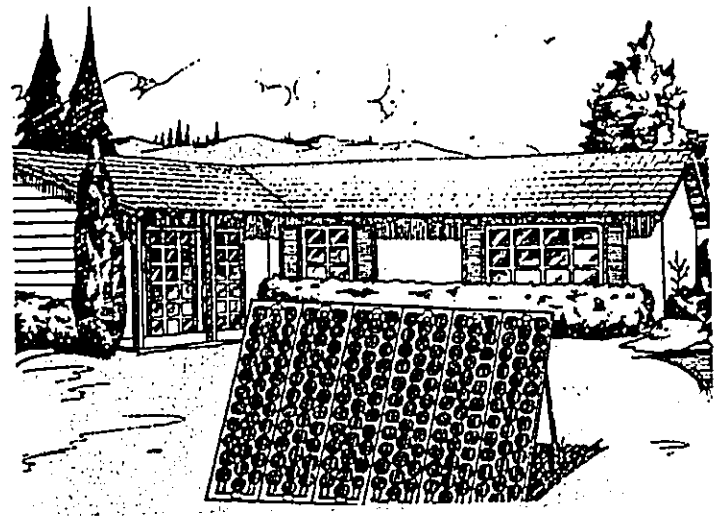
PV modules have been tested in controlled settings and in the field, with results showing module lifetimes in excess of 20 years. Other system components have varied lifetimes. (batteries can last 2-15 years, and power electronics are the most sensitive components).

– Mark Fitzgerald

Transportable, Containerized Solar System

Complete "turn-key" PV systems worldwide

Standard and custom systems built in 20' shipping containers. Mounting platform for up to 4000 watts of PV, 150 sq.ft. interior space, and a weatherproof high security shelter. Transport by boat, rail or truck. Ready within 60 days.



Home Power Systems

How much does a solar electric system cost? Different people's solar electric systems vary as much as different people's utility bills. The best way to design a system is to list all the appliances and lights you think you will use, find out how much power each uses, and estimate how long per average day you will use them. Multiply the watts each uses by the hours of daily usage. Add the totals to get your daily energy requirement. Our $2 PV Design & Sizing booklet will help you determine this as well as battery bank size and other components. Our $2 Home Power Systems booklet describes 39 different systems listing parts, costs and capabilities. The five systems listed here will give you an idea of what some systems will do and how much they will cost.

System	Power Output	Cost
System PS100	600 watt hours/day	$1350
System PS101	1200 watt hours/day	$2525
System PS102	2400 watt hours/day	$5900
System PS103	5000 watt hours/day	$12,500
System PS104	10,000 watt hours/day	$29,200

Marine Solar Electric Systems

Nowhere is a steady, reliable source of electricity more vital than when traveling on water. In most marine settings, solar power is abundant without obstruction from trees and buildings. Solar electric power for ships and boats is a natural—the most reliable source of electricity on earth matched with the most critical of loads. The maintenance system solves the problem of battery self-discharge and includes a special battery. Weekend Sailor System 1 powers lighting, radio and electronic loads. System 2 adds use of refrigeration. Serious Sailor Systems include the special LifeSaver module and provide large power requirements.

System	Power Output	Cost
Maintenance (#PS200)	175 watt hours/week	$290
Weekend Sailor 1 (#PS201)	270 watt hours/day	$670
Weekend Sailor 2 (#PS202)	540 watt hours/day	$1190
Serious Sailor 1 (#PS203)	600 watt hours/day	$1575
Serious Sailor 2 (#PS204)	1200 watt hours/day	$3200

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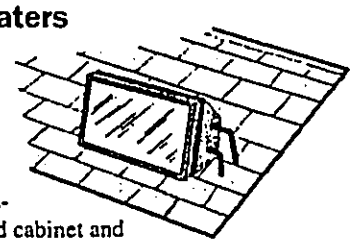
Solar Heater Control Package

is illing solar water? We've done the hard part for you!

ncludes mounted controller, sensors, pump, 2-gal. expansion tank, ir ·l: valve, pressure gauge, drain-fill assembly and separate air :ı pressure relief valve, and 2 sensors. Mounted on a plywood ɔa.d, pre-plumbed and ready to install! Options available for larger 'stems.

H 1722 $575

uncatcher Water Heaters



l: inate most or all of your ε r heating costs with this asy-to-install, passive solar atch collector. Sunlight passes u ıgh two tempered glass l: s then heats a black chrome-ɔated storage tank. An insulated cabinet and u·l glazing keep the water hot. The heated water ı: goes into a backup water heater or directly to point of use. f.. nt on ground or roof—no pumps, electricity or moving parts to 'ear out. Easy to insfall, just 2 connections—cold water in and hot :'·r out. Best for warm climates, preheating water, summer only in ɔ places, or when hot water needed only in afternoons & v..ings. 40 gallon tank.

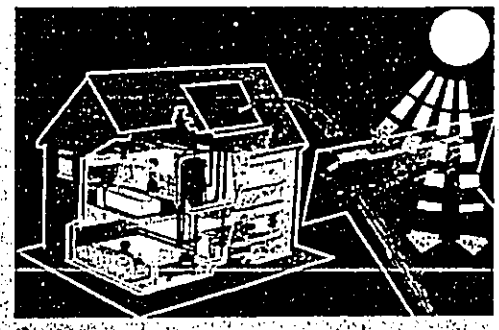
uncatcher I (HW 1356) 26" x 36" x 78", 150 lbs $900

Heliotrope Solar Sidebar

u · solarize your solar water system.

's a small PV module and eliminate freeze-p possibility caused by 115 vac ump/controller error. You no longer need an .(ɔowered circulation pump, controller or e exchanger in your solar water heating ystem! Solar Sidebar installs on the side of n·· electric water heater, (at the bottom drain c ıection), and provides a safe, reliable, 12V .r...ı down system. Monitor performance with he digital thermometer and flow rate n·· :ators. Can't freeze up in cold weather. 'ε :s less than 1/3 the normally required ɔower—just the included 10W PV panel. ·pecial monitors make it fun to watch your y :m as the sun moves across the sky—a l: meter indicates the amount of water noving through your system, and a emperature monitor with LCD displays water e: ıerature in your storage tank and in the v. r returning from your collectors. (Use with lat plate thermal collectors from 24 to 96 quare feet.) Heliotrope has confidence in their c rollers: they've made over 1/2 million of h ı since 1974 and give a 10 year warranty.

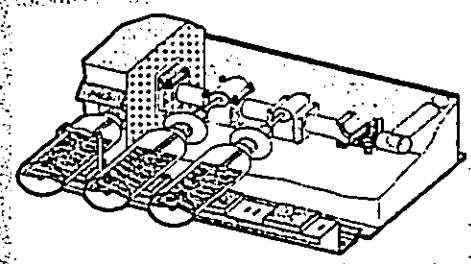
Solar Sidebar (HW1582) $750



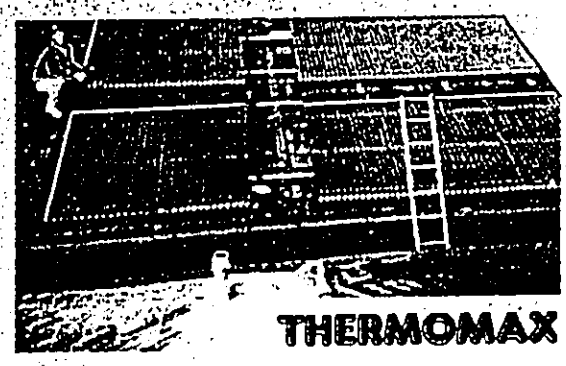
Thermomax Solar Collectors

70% of domestic hot water in worst case climates

When US tax credits stopped, most companies went out of business. New research & development almost completely stopped. In Europe, progress continued and evolved into the Thermomax. Over one million now in use in 30,000+ locations in 30+ countries. Nine major international awards. Provides 100% of domestic hot water in good solar areas. Converts twice the energy of a good quality flat plate collector with exceptional performance in cloudy and cold weather. So light and modular one person can install, it pays for itself many times over. (Return on investment generally 5-10%.) Annually saves the equivalent pollution of one automobile. Great for central heating and swimming pools. Small home system includes 20 Thermomax tubes, manifold, roof mount, valves, pump, control, expansion tank with safety relief, control circuits, etc. Medium size has 30 tubes. Please call for design and sizing help.



Small home/cabin system with low use	**(HW1544)**	**$2450**
Off-grid version	**(HW1547)**	**$2600**
Medium size home, full time	**(HW1548)**	**$3120**
Off-grid version	**(HW1549)**	**$3470**



DRAFT EA COMMENT LETTERS AND RESPONSES

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

November 21, 2001

Mr. Gilbert Coloma-Agaran, Chair
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Coloma-Agaran:

Subject: Draft Environmental Assessment for the Flinn Single Family Residence, Kaupo, Maui (CDUA)

Thank you for the opportunity to review the subject document. OEQC has the following comments.

1. Please consult with immediate neighbors and potentially affected community groups concerning the proposed project.

2. Please include your findings and reasons for the finding of no significant impact. Please see the enclosed example.

3. Please consult the DLNR Commission on Water Resources Management concerning the proposal to obtain water from a well. Describe the location of the proposed well and respond to relevant questions listed in the enclosed "Guidelines for Assessing Well Development Projects."

4. Please consult with the Department of Health concerning the proposed individual wastewater system.

5. We are pleased to hear about your plans to use solar water heating and a photovoltaic power system. You could be eligible for a 35% Hawaii state tax credit on the cost of your solar system. Please contact the state Department of Taxation for more information.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Genevieve Salmonson
Director

c: Paul Flinn

Paul L. Flinn
1310 Piiholo Road
Makawao, Hawaii 96768

January 30, 2002

Ms. Genevieve Salmonson
Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Attn: Mr. Jeyan Thirugnanam

Dear Mr. Thirugnanam,

RE: CDUA File No. KA-3051 *Flinn Single Family Residence*, Kaupo, Maui, Hawaii.

Thank you for your comments regarding this Conservation District Use Application dated November 21, 2001.

1. Per our conversation on December 6, 2001, my wife and I have notified our neighbors of our intent to build a retirement house on our land in Kaupo. We have also gotten signatures from them. (See enclosed)

2. We have included our findings and reasons for the finding of no significant impact in our final environmental assessment.

3. We have (in our draft EA) proposed either a well or catchment system. Due to cost of a well, we will be using a private catchment system for our residence.

4. We have addressed the Department of Health letter dated December 11, 2001 regarding our proposed individual wastewater system. This is included in our final EA.

5. Thank you for informing us about a possible Hawaii State Tax Credit on the cost of our solar system.

If you have any further questions, please do not hesitate to call me at 242-1955.

Sincerely,

Paul L. Flinn

Maui Cultural Lands Inc.
Ed Lindsey, President
1087-A Pookela Rd.
Makawao, Maui 96768
Feb. 21, 2002

To: Planner, Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Retirement Home for Paul and Sally Ann Flint
TMK 1-7-1:49 Kaupo, Maui

Dear Sir,

Maui Cultural Lands Inc. is a newly formed land trust whose primary objective is to save existing cultural lands, archaeological sites, and to restore native forests for the next generations. We are made up of people from diverse professions, racial extractions and cultural practioners. Our purpose is to rediscover, protect, regenerate and to share these resources with the community and visitors of Maui County.

The applicants, Paul and Sally Ann Flint, are people who have shown a commitment to the above values and objectives in their every day lives. They are involved in the full spectrum of canoe culture, native plants, hula, Polynesian architecture, and more importantly, aloha and malama concepts.

TRADITIONAL ACCESS: While there is a traditional fishing trail that skirts their 6.7 acres of land, these trails will remain open to those who need the pathway to their fishing grounds. It must be stressed that this access will not be marked so as to invite strangers and malihinis to this dangerous path.

LONG TERM IMPACT: Their intent is to build a 1300 sq. ft. retirement home and a 400 sq. ft. storage shed for their alternative energy system. With a composting toilet system in place their home will be of no impact on

the nutrient level of the ocean. As an architect, Mr. Flint's design for his dwelling will flow with the terrain thereby not intruding with viewing vistas. As native plant students and working under the guidance of Mr. Rene Sylva, native plant expert, they intend to use the appropriate plants with attention to genetic purity.

ARCHAEOLOGICAL SITES: Following an investigation of a certified archaeologists, one site was discovered that was of transit importance. Being involved with other archaeological projects on Maui they understand the fragile state and care they require.

CONCLUSION: It has been shown that the applicants have more than a commitment to save all things Hawaiian but also a willingness to guarantee traditional access to fishing as outlined in HRS 6e. We at Maui Cultural Lands Inc. feel secure with the recommendation for approval of this Dwelling at TMK 1-7-1: 49 Kaupo, Maui.

Mahalo nui loa,

Ed Lindsey

Ed Lindsey, President
Maui Cultural Lands Inc.

cc
Genevieve Salmonson
Office of Environmental Quality Office

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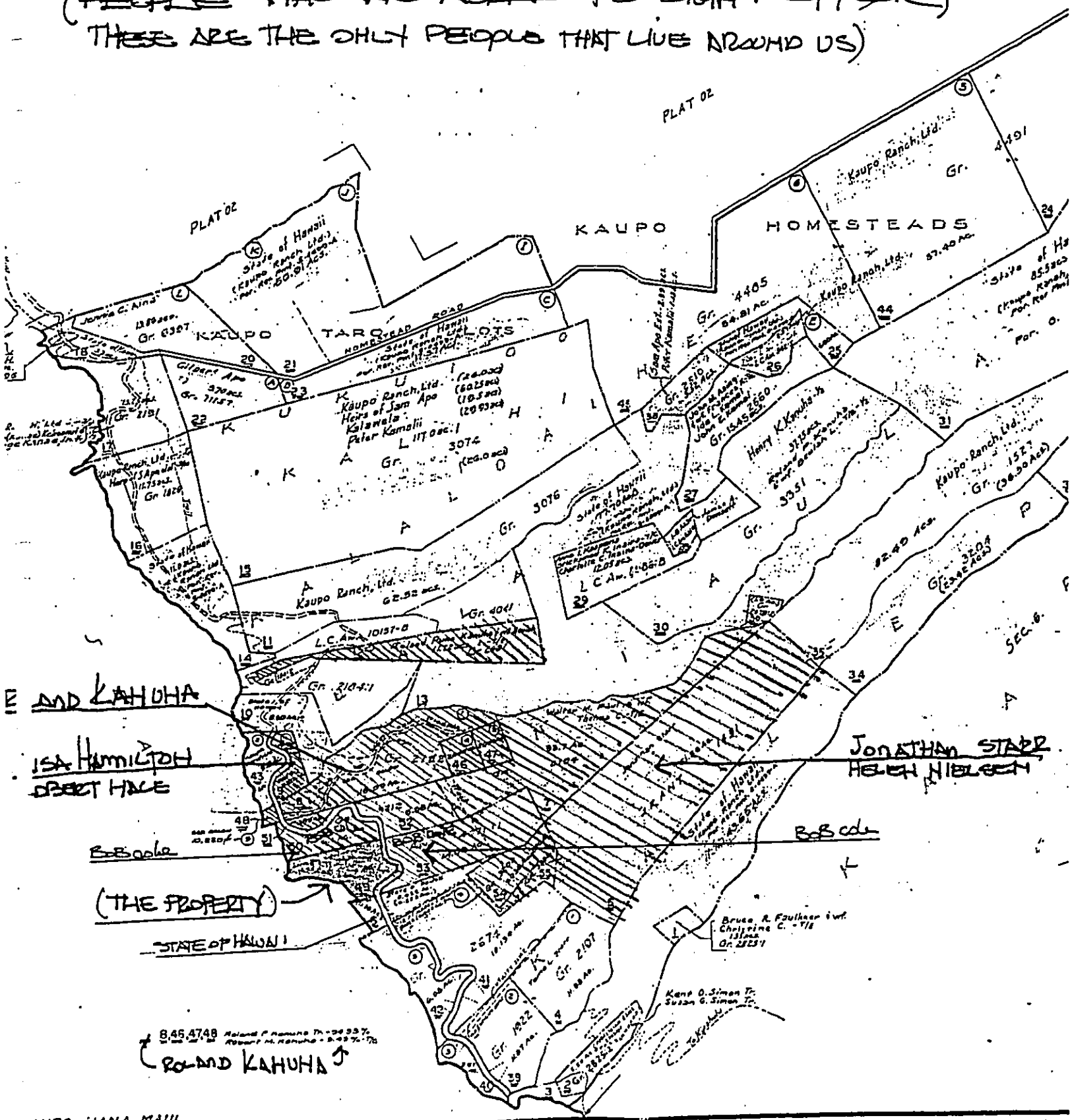
PLAT

(PEOPLE WHO WE ASKED TO SIGN LETTER)
THESE ARE THE ONLY PEOPLE THAT LIVE AROUND US)



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Aloha December 14, 2001

It has been requested of us from Genevieve Salmonsen of the Office of Environmental Quality Control (OEQC) for the State of Hawaii to consult with our immediate neighbors and potentially affected community groups regarding the construction of our single family retirement dwelling on our state general conservation land. The property is 6.7 acres located approximately 12 miles southeast of the Hana town. The dwelling is on the makai side of Hana Highway approximately 250 feet from the property. The retirement dwelling is 1296 square feet single story not visible from the Hana Highway. We are sensitive to the land. Therefore our main constructional objective is not to be visible from the highway and to have a construction style that blends with the enviroment and not to impact the natural rugged terrain. We will also construct a 400 square foot storage structure on half acre for the electrical system. We will be utilizing composting toilet system and solar electric power system.

If you are in support of our retirement dwelling please sign below or write a letter of acceptance.

Mahalo nui loa.

Paul and Sally Ann Flinn

In support:

Helen Nielsen

Helen Nielsen

Jonathan Starr

2/19/02

DOCUMENT CAPTURED AS RECEIVED

Aloha December 14, 2001

It has been requested of us from Genevieve Salmonsen of the Office of Environmental Quality Control (OEQC) for the State of Hawaii to consult with our immediate neighbors and potentially affected community groups regarding the construction of our single family retirement dwelling on our state general conservation land. The property is 6.7 acres located approximately 12 miles southeast of the Hana town. The dwelling is on the makai side of Hana Highway approximately 250 feet from the property. The retirement dwelling is 1296 square feet single story not visible from the Hana Highway. We are sensitive to the land. Therefore our main constructional objective is not to be visible from the highway and to have a construction style that blends with the enviroment and not to impact the natural rugged terrain. We will also construct a 400 square foot storage structure on half acre for the electrical system. We will be utilizing composting toilet system and solar electric power system.

If you are in support of our retirement dwelling please sign below or write a letter of acceptance.

in support, Lisa Hamilton

Mahalo nui loa.

Robert E Hall

Paul and Sally Ann Flinn

2-17-02

DOCUMENT CAPTURED AS RECEIVED

December 14, 2001

Aloha

It has been requested of us from Genevieve Salmonson of the Office of Environmental Quality Control (OEQC) for the State of Hawaii to consult with our immediate neighbors and potentially affected community groups regarding the construction of our single family retirement dwelling on our state General conservation land. The property is 6.7 acres located approximately 12 miles southeast of the Hana town. The dwelling is on the makai side of Hana Highway approximately 250 feet from the property. The retirement dwelling is 1296 square feet single story not visible from the Hana Highway. We are sensitive to the land. Therefore our main constructional objective is not to be visible from the highway and to have a construction style that blends with the enviroment and not to impact the natural rugged terrain. We will also construct a 400 square foot storage structure on half acre for the electrical system. We will be utilizing composting toilet system and solar electric power system.

If you are in support of our retirement dwelling please sign below or write a letter of acceptance.

Mahalo nui loa.

Paul and Sally Ann Glenn

[illegible]

Mrs. Paulette J. Kaauwha

DOCUMENT CAPTURED AS RECEIVED

December 14, 2001

Aloha

It has been requested of us from Genevieve Salmonsen of the Office of Environmental Quality Control (OEQC) for the State of Hawaii to consult with our immediate neighbors and potentially affected community groups regarding the construction of our single family retirement dwelling on our state general conservation land. The property is 67 acres located approximately 12 miles southeast of the Hana town. The dwelling is on the makai side of Hana Highway approximately 250 feet from the property. The retirement dwelling is 1296 square feet single story not visible from the Hana Highway. We are sensitive to the land. Therefore our main constructional objective is not to be visible from the highway and to have a construction style that blends with the enviroment and not to impact the natural rugged terrain. We will also construct a 400 square foot storage structure on half acre for the electrical system. We will be utilizing composting toilet system and solar electric power system.

If you are in support of our retirement dwelling please sign below or write a letter of acceptance.

Mahalo nui loa.

Paul and Sally Ann Glinn

Robert K Cole

GENERAL PARTNER
KAUPO HUI
PARCEL 1 ONLY

WE OWN THE FOLLOWING PARCELS: TMK 1-7-1-50, 52, 53, 54, 56, 57, 58, & 7

FINDINGS AND REASONS SUPPORTING DETERMINATION

SIGNIFICANCE CRITERIA: According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other project, and its short and long-term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

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

The proposed project will not impact scenic views. The visual character of the area will not change appreciably due to the modest scale of this proposal. In addition, the subject property is located outside of the County Special Management Area (SMA).

As previously noted, no significant archaeological or historical sites are known to exist at the project's site. Should any archaeologically significant artifacts, bones, or other indicators of previous onsite activity be uncovered during the construction phases of this dwelling, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

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

Again the modest scale of the proposed dwelling will not preclude beneficial uses of the environment. Currently the project site is overgrown with Christmas berry, lantana and strawberry guava; three invasive and alien species that do prohibit beneficial use of the environment. Clearing of theses plants and the growing of native species will restore beneficial use of the environment that is currently being denied.

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

To the best of the Applicant's understanding the proposed development is consistent with the environmental policies established in Chapter 344, HRS, and the National Environmental Policy Act.

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

The proposed project will not alter the economic or social welfare of the community at large. Its scale is modest and the proposed residential use will neither contribute to nor substantially detract from the community welfare.

(5) Substantially affects public health;

Impacts to public health will be insignificant and not detectable. The proposed dwelling will be energy self-sufficient and will utilize 'green' solutions to waste management. Recycling, septic, and gray water systems will be employed to minimize any impacts on the environment. This project will not substantially affect the public health.

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

There will be no substantial secondary impacts generated by the proposed retirement dwelling. The site is very remote, there are no children involved that might add to school population and the project is design to be self-sufficient to minimize such impacts.

(7) Involves a substantial degradation of environmental quality;

The proposed project will utilize existing vacant pastureland. It is anticipated that through an active program of alien species removal, control of feral grazing populations and reforestation with native plants that the project will actually improve the natural environment.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

This is an individual project and makes no commitment to larger actions that will have a negative impact on the natural environment.

(9) Substantially affect rare, threatened or endangered species or its habitat;

No endangered plant or animal species are located on or near the project site.

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

The remoteness of the proposed dwelling site coupled with the environment awareness of the Applicants and the design of the project precludes detrimental effects to air, water, or noise levels.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;

The proposed dwelling is compatible with the above criteria since there are no environmentally sensitive areas associated with the project and the physical character of the site has been previously distributed by cattle grazing. Shoreline, valleys, or ridges will not be impacted by the project.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

Due to topographical characteristics and existing tree cover on the property, there are no views of the dwelling site from Hana Highway. The Applicants are committed to reinforcing existing planting with native species.

(13) Requires substantial energy consumption;

This dwelling is not large and will produce its own energy through a solar-voltaic system. Construction of the project will not require substantial energy consumption and will be site generated with no reliance on the public utility system.

SUSPENSE DATE: November 13, 2001

STATE OF HAWAII
Department of Land and Natural Resources
Division of Aquatic Resources

MEMORANDUM

To: William Devick, Administrator
From: Richard Sixberry, Aquatic Biologist
Subject: Comments on Conservation District Use Application MA-3051

Comments Requested By: Harry Yada - Land Division

Date of Request: 10/22/01 Date Received: 10/23/01

Summary of Project

Title: Single Family Residence

Proj. By: Paul Flinn

Location: Kaupo, Maui

Brief Description:

The applicant proposes to construct a single family dwelling within the Conservation District with related improvements on a shoreline parcel on the west slope of Haleakala near Hana Town, Maui. The property line is on top of a shoreline cliff, 160 to 180 feet high. Occasional fishing access use of Mokuia Point across southerly point of property will not be affected.

Comments:

Significant impacts adverse to aquatic resource values are not expected from the proposed residence.

We suggest that site work be conducted, as much as possible, during periods of minimal rainfall; all areas denuded of vegetation should be quickly stabilized to control erosion; and precautions taken to prevent construction materials, debris, eroded soil, petroleum products and other potential contaminants from entering the coastal aquatic environment.

Richard Sixberry
Aquatic Biologist

Paul L. Flinn
1310 Piiholo Road
Makawao, Hawaii 96768

January 30, 2002

Mr. Richard Sixberry
Aquatic Biologist
State of Hawaii
Department of Land and Natural Resources
Division of Aquatic Resources

Dear Mr. Sixberry,

RE: Conservation District Use Application (CDUA)
File No. KA-3051
Response to your Memo dated October 23, 2001

Thank you for your comments regarding this Conservation District Use Application. Below please find our response to these comments.

The proposed project will involve minimal grading since the objective is to site the structure on existing level section of the land. All sitework will be constructed during summer months. The house will be constructed on post and pier and will sit above existing grade. Native plants, groundcover, grasses, shrubs and trees will be used to stabilize any disturbed areas.

If you have any further questions, please do not hesitate to call me at 242-1955.

Sincerely,

Paul L. Flinn

NOLULU, HI 96813
Yada Land Div.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL NISHIOKA

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DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

November 20, 2001

MEMORANDUM

LOG NO: 28616
DOC NO: 0111CD20

TO: Harry Yada, Administrator
Land Division

FROM: Don Hibbard, Administrator
State Historic Preservation Division

SUBJECT **Chapter 6E-42 Historic Preservation Review Pertaining to the Application for Conservation District Use Permit for the Proposed Construction of a Single – Family Residence on the Paul Flinn Property (File NO.: Ma – 3051) Kalepa Ahupua'a, Hana (Kaupo) District, Island of Maui TMK: 1-7-01:049**

Thank you for the opportunity to review and comment on the application for Conservation District Use Permit (CDUA) for the proposed construction of a single – family residence to be constructed on the Paul Flinn property. Based on the submitted CDUA, we understand the proposed undertaking consists of the construction of two separate structures, the residence and a storage facility, and associated utilities.

Xamanek Researches has recently conducted an archaeological inventory survey, including subsurface testing, of the subject property. During the survey, one historic sites (State Site –5058, a traditional fishing area) was identified which is located adjacent to, but outside of the proposed project area. The report (Fredericksen and Fredericksen 2001) documenting the findings of the inventory survey has been reviewed and accepted by this office (SHPD DOC NO.: 0106MK04/LOG NO.: 27364).

Given the above information, we believe the proposed undertaking will have "no effect" on significant historic sites.

However, we do recommend that attention be given to the access to this traditional places; that is to Site 5058. The inventory survey states ... "[a]ccess to this area appears to be from Hana Highway, primarily on the adjacent property to the west, at the edge of the sea cliff. It also appears to cross the *makai* border of the Flinn parcel." PASH concerns may exist for this access.

Please call Cathleen Dagher at 692-8023 if you have any questions.

CD:jen

Paul L. Flinn
1310 Piiholo Road
Makawao, Hawaii 96768

January 30, 2002

Mr. Don Hibbard
Administrator
State of Hawaii
Department of Land and Natural Resources
Historic Preservation Division
Kahuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Hibbard,

RE: Chapter 6E-42 Historic Preservation Review Pertaining to the Application for Conservation District Use Permit for the Proposed Construction of a Single-Family Residence on the Paul Flinn Property (File No.: Ma-3051) Kalepa Ahupua`a, Hana (Kaupo) District, Island of Maui
TMK: 1-7-01:049

Thank you for your comments regarding this Conservation District Use Application.

As stated in Xamanek Research's Archaeological Inventory Survey accepted by your office (SHPD Doc. No. 0106MK04/Log No. 27364). The owner Paul and Sally Ann Flinn will continue to allow access to site 505B across the southwest portion of our property.

Our property is about 400 feet from the Hana Highway. The fishing access has 3 ladders to get down to the fishing area. Traditional fishing acess will not be disturbed in any way, there is no physically ability to get to the area from our proposed house site.

If you have any further questions, please do not hesitate to call me at 242-1955.

Sincerely,

Paul L. Flinn

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
Telephone (808) 270-7816 • Fax (808) 270-7833

November 20, 2001

Honorable Gilbert S.Coloma-Agaran, Chairperson
Board of Land and Natural Resources
State of Hawaii Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Conservation District Use Application File No. KA-3051

Dear Chairperson Coloma-Agaran,

Thank you for the opportunity to review this application. The Department of Water Supply has the following comments.

The Department of Water Supply does not presently service the project area. The applicant proposes construction of a water well. The project site is overlying the Kipahulu aquifer with an estimated sustainable yield of 49 mgd. We recommend that all water service and fire protection improvements be installed in accordance to water system standards.

In order to conserve water resources, we suggest the applicant to consider these measures in and around the property where appropriate:
Eliminate Single-Pass Cooling: Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.
Utilize Low-Flow Fixtures and Devices: Maui County Code Subsection 16.20A.680 requires the use of low flow water fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs.
Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.
Use Climate-adapted Plants: The project site is located in "Maui County Planting Plan" - Plant Zone 5. We are pleased to note that the applicant proposes to use native plants in landscaping. Please refer to the "Maui County Planting Plan", and to the attached document. Native plants adapted to the area, conserve water and further protect the watershed from degradation due to invasive alien species.
Prevent Over-Watering By Automated Systems: Provide rain-sensors on all automated irrigation

controllers. Check and reset controllers at least once a month to reflect the monthly changes in evapotranspiration rates at the site.

Should you have any questions, please call our Water Resources and Planning Division at 270-7199.

Sincerely,

David Craddick
Director
emb

cc: engineering division
applicant w/attachments:

1) "The Costly Drip"
2) "Saving Water in the Yard: What & How to Plant in Your Area"
3) Ordinance 2108 - "An ordinance amending Chapter 16.20 of the Maui County Code, pertaining to the plumbing code"
4) *Water Conservation for The Home*

Paul L. Flinn
1310 Piiholo Road
Makawao, Hawaii 96768

January 30, 2002

Mr. David Craddick
Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Craddick,

RE: Conservation District Use Application No. KA-3051
Single Family Residence for Mr. & Mrs. Paul Flinn

Thank for your comments regarding this Conservation District Use Application.

1. The proposed project will be serviced by a private catchment system. My wife and I proposed in the draft EA either a catchment system or well. (If we could afford it.) If in the future we decide on a well, we will proceed according to the guidelines for water well development.

2. We will not be using single-pass cooling system.

3. We will be utilizing low-flow fixtures on our faucets and showerheads.

4. It's to our advantage using a catchment system to have a regular maintenance program.

5. As noted, all our planting will be native species.

6. There will be no irrigation system.

If you have any further questions, please do not hesitate to call me at 242-1955.

Sincerely,

Paul L. Flinn

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
File:

01-145/cpo

December 11, 2001

Mr. Harry Yada, Administrator
Land Division
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Yada:

Subject: Conservation District Use Application (CDUA)
Construction of a Single Family Residence at Kaupo, Makawao
Maui, Hawaii
Tax Map Key: (2) 1-7-1: 49

Thank you for the opportunity to review and comment on the subject proposal. We have the following comments to offer at this time:

Wastewater Branch

1. The project site is located in a critical wastewater disposal area as determined by the Maui Wastewater Advisory Committee. New cesspools will not be allowed in this area. Therefore, as there is no County sewer service in the vicinity and none will be planned in the near future, we concur with the project provided that domestic wastewater is treated and disposed of by an engineer designed individual wastewater system; and

2. All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules.

If you have any questions please contact the Planning/Design Section of the Wastewater Branch at (808)586-4294.

Sincerely,

GARY GILL
Deputy Director
Environmental Health Administration

c: WWB

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STATE OF HAWAII

Paul L. Flinn
1310 Piiholo Road
Makawao, Hawaii 96768

January 30, 2002

Mr. Gary Gill
Deputy Director
Environmental Health Administrator
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr.Gill,

RE: CDUA File No. KA-3051, Single Family Residence, Mr. & Mrs. Paul Flinn
Kaupo, Maui, Hawaii

Thank you for your comments regarding this Conservation Use Permit Application.

1. A composting toilet will be installed for the project's wastewater disposal system. The composting toilet does not require the use of chemicals or leach field and is considered to be an environmentally safe system.

   The wastewater disposal system will be designed in accordance with the State Department of Health Administrative Rules Chapter 11-62 "Wastewater Systems".

If you have any further questions, please do not hesitate to call me at 242-1955.

Sincerely,

Paul L. Flinn

JAMES "KIMO" APANA
Mayor

JOHN E. MIN
Director

CLAYTON I. YOSHIDA
Deputy Director

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DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

COUNTY OF MAUI
DEPARTMENT OF PLANNING

December 19, 2001

Mr. Harry Yada, Administrator
DLNR, Land Division
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Yada:

Re: Request for Comments on a CDUA Permit for Mr. and Mrs. Paul Flinn for Property at TMK: 1-7-01:049

Thank you for allowing us to comment on the above project. The exemption issued for the project is valid provided that the project plans do not significantly change in the future. We request that a public access sign be placed at the head of the fishing access trail. This sign shall be visible from the public right-of-way. Said sign shall not exceed four (4) square feet and shall be maintained by the land owner.

Should you require further clarification, please contact Mr. Joseph Alueta, Staff Planner, of this office at 270-7735.

Very truly yours,

JOHN E. MIN
Planning Director

JEM:JWA:cmb
c: Clayton Yoshida, AICP, Deputy Director of Planning
Aaron Shinmoto, Planning Program Administrator (2)
Joseph Alueta, Staff Planner
Project File
General File
K:\WP_DOCS\PLANNING\LETTERS\ltr2001\flinn cdua permit.wpd

Jan. 23, 2002

~~DEAR~~ John,

Thanks for reviewing this. I've enclosed the T.M.K., MAP, SURVEY USGS & photos, plus letter from Joe Alveta.

As you can see there are a lot of fishing access points on the back side non with signs. Also our property is about 400 feet from the Hana Highway R.O.W. and about 160' Below the Highway, you would not be able to see a sign on our property.

I will wait to hear from you.

Thanks again
Sallyann & Paul Fleming

Phone: Feb 6. | Feb. 12 | Feb 20 | Feb 22

(no Responce)

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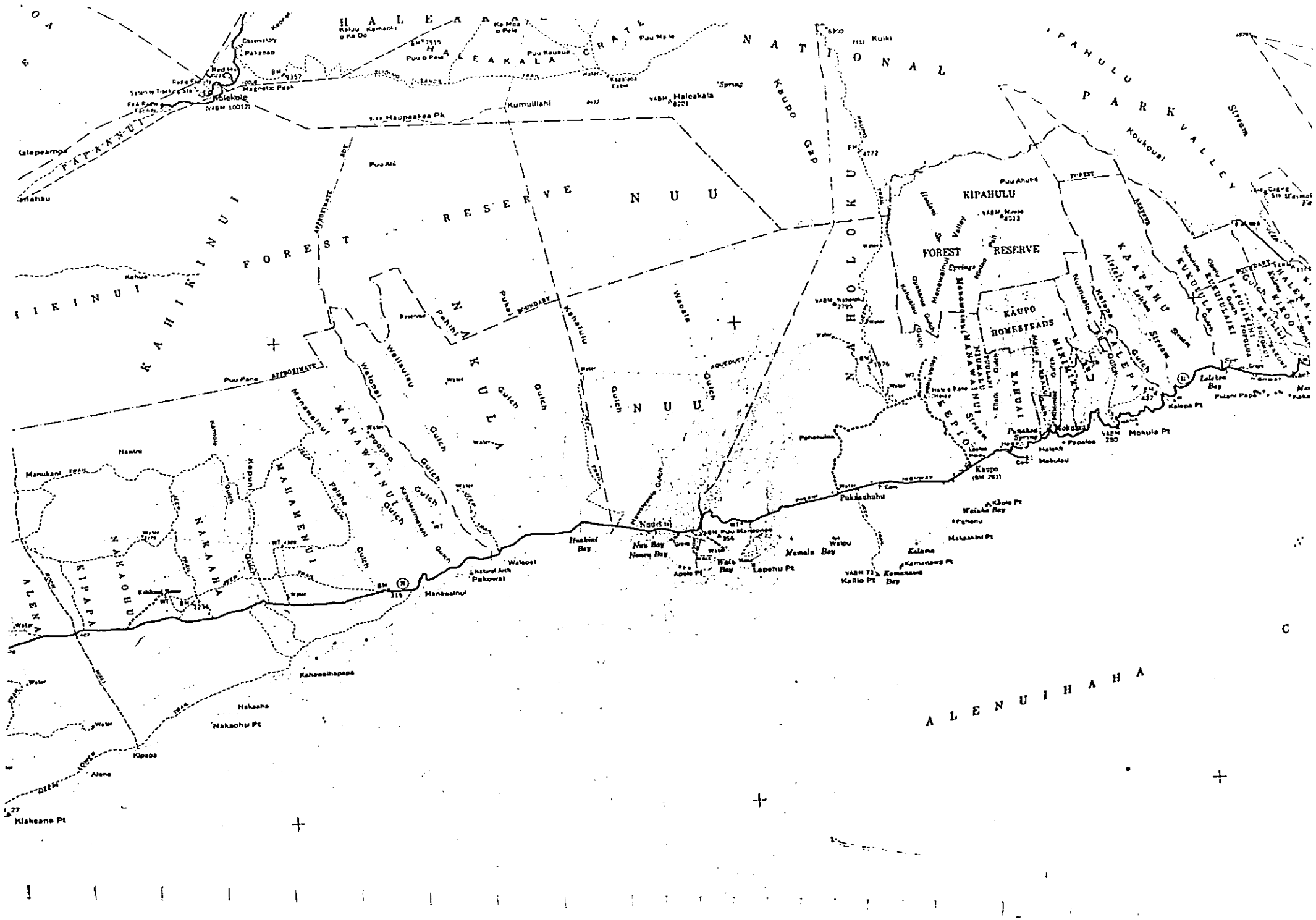

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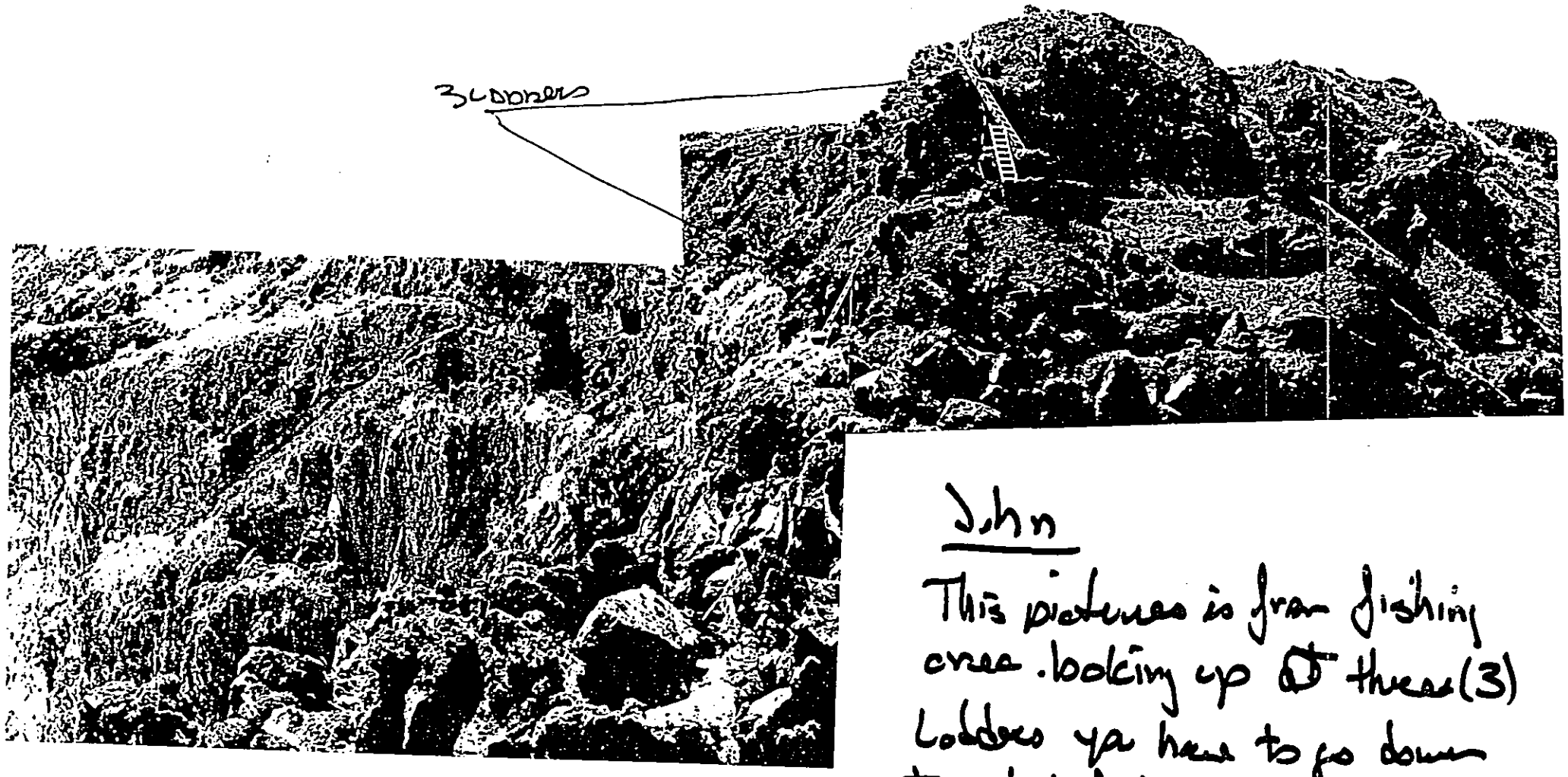

John

This pictures is from fishing area. looking up at these (3) Ladders ya have to go down to get to fishing area.

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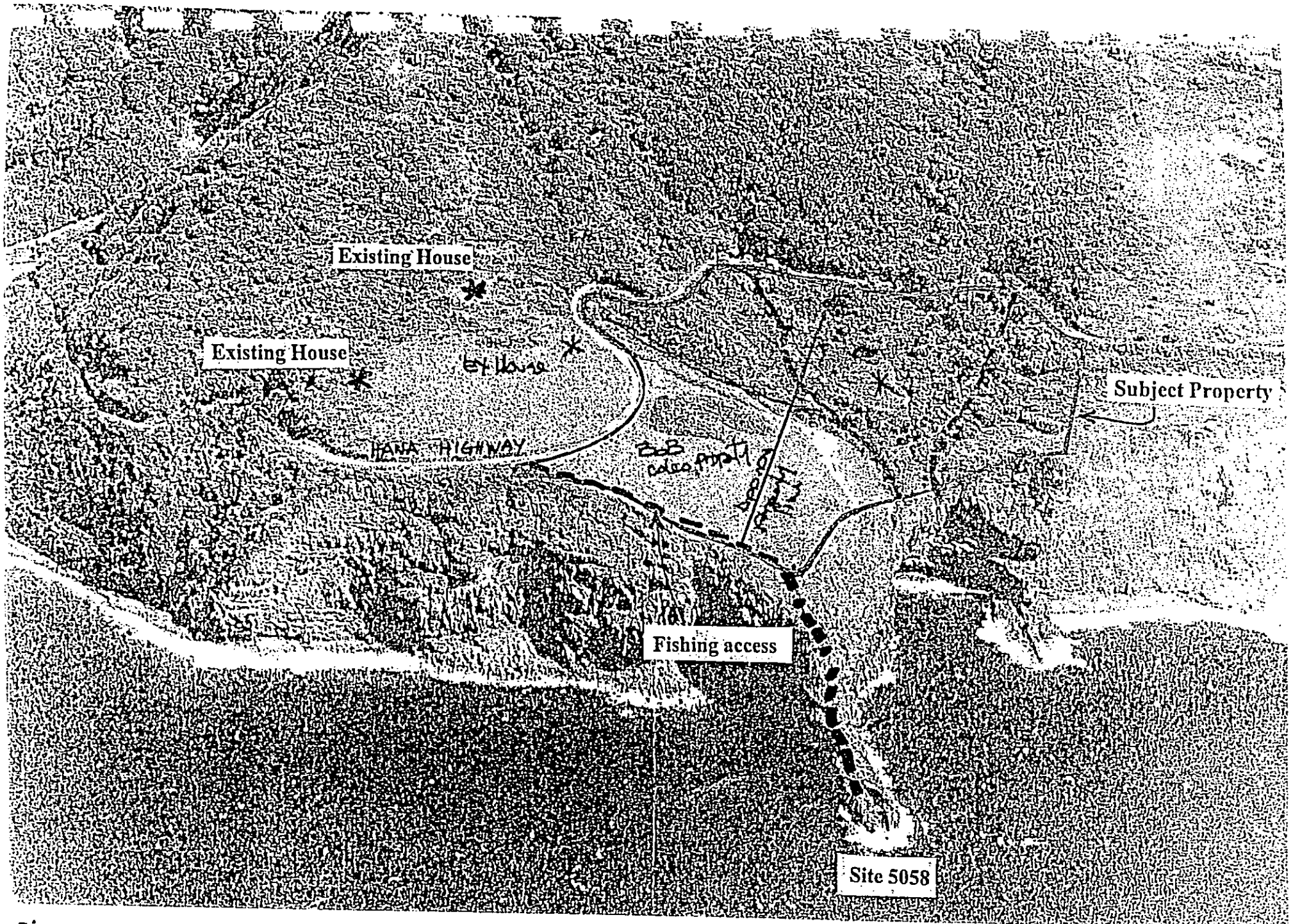

Figure 1 – Aerial view of study parcel.

John: our property is about 400' from Hwy & 160' down from Hwy

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Hanson
Associates
Lewis Mill, Jefferson, MD 21755
301-371-9172 • FAX 301-371-9644

composting toilets — graywater systems

John Hanson
Bob Hanson
clivus®
Authorized Representative

GRAYWATER USE SYSTEMS SUMMARY

Graywater systems described here use graywater in the landscape instead of disposing it underground where it contaminates groundwater. These systems distribute aerobic (not septic) graywater over, or in, the root zone for direct irrigation and nutrient absorbtion (fertilization). Public health is protected by separate composting of human body products, and by providing in all systems a physical barrier to direct human contact with the graywater. Graywater systems are designed to complement the site: indoors in soil beds or green houses; outdoors at-grade or elevated; attached to the building or remote; any shape. System sizing depends on graywater flow, percolation rate, depth of limiting zone, which system is chosen, and landscape position. Graywater use systems generally take less land area than sewage disposal systems and range in cost from $2,000 to $8,000 for a typical residence.

The Irrigation Trough: A flooding dose delivers graywater to a level soil interface, defined by a bottomless trough, located 6" below grade in a root zone. The trough's removable lid allows for periodic inspection and leveling of the graywater to soil interface. No prefiltration is required.

The Mulch Basin: A flooding dose delivers graywater to a level-bottomed, mulch filled top soil basin created directly over the root zone of trees or large shrubs. No prefiltration is required.

The Mulch Bed: Graywater is prefiltered by a Clivus Graywater Filter and then distributed to the soil bottom of a mulch bed through Clivus Graywater Pipes.

Drip Irrigation: Graywater is prefiltered by a Clivus Graywater Filter, then goes through a secondary micro-filter, then to a drip irrigation system installed under 3" of mulch or soil (seasonal outdoors, year-round indoors).

The Constructed Wetland: Graywater is prefiltered by a Clivus Graywater Filter, then passes through the rhizome network of aquatic plants (such as cattails) growing in a watertight, shallow bed, filled with gravel or soil. The effluent can be used for surface irrigation or disposed in a reduced size subsurface infiltration chamber.

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Hanson Associates
205 Poffenberger Rd. (Lewis Mill)
Jefferson, Maryland 21755
301-371-9172 • FAX 301-371-9644

composting toilets — graywater systems

clivus®
Clivus Multrum, Inc.
Authorized Representative

HANSON NUTRIENT RECYCLING SYSTEMS

Composting Toilets • **Compost and Liquid Fertilizer Use Plan** • **Graywater Flower Bed**

- All nutrients and organic matter safely recycled to the land based food chain *(site vegetation)*
- Less expensive than mound systems, other "innovative" systems, sewers, and some "conventional" systems (typical residential - $14,000; commercial and public facility - $5,000 and up)
- Can make unbuildable lots buildable, can correct existing failing septic systems, and can make indoor plumbing possible

The Clivus Multrum **composting toilet** (NSF approved) converts human body products and food scraps into odor-free, safe-to-handle, compost and liquid fertilizer.

The **compost and liquid fertilizer use plan** for a typical residence would specify that the 2 bushels of compost generated per year shall be raked into the lawn or used as a fertilizer around shrubs or trees, and that the 300 gallons of liquid fertilizer generated per year shall be applied to a 30 foot by 40 foot area of lawn.

The **graywater flower bed** includes: the dosing station where all washwater from sinks, showers, and laundry accumulates; and is dosed to the flower bed(s); the flower bed(s) designed aesthetically into the landscape; and the irrigation trough running down the middle of the bed(s), installed level so a flooding dose will be distributed evenly to the ends of the trough. Vegetation growing around the trough is irrigated and fertilized, and clean water is returned to the soil under the bed. The system uses no septic tank and is permanent, fully automatic, non-clogging, and low maintenance. The low flow, low pollutant load, and shallow design enables the graywater flower bed to overcome many of the site restrictions relevant only to sewage systems.

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Hanson Nutrient Recycling Systems

Hanson Associates -- Nutrient Recycling System Specialists

- Free Consulation
- Site Visits
- Plan Review
- Design Service
- Demonstration Site
- Assistance with Permits
- Installation Service
- Maintenance Service

Enc: Demonstration Site (Hanson Associates)
Clivus Flyer/Price List
Testimonial
Graywater Flower Bed Systems in Maryland
Clivus Installations

Upon Request:
Regulatory Needs
Land Application of Clivus Liquid Fertilizer
Design Guidelines -- Graywater Flower Bed

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Hanson Associates
3205 Poffenberger Rd. (Lewis Mill)
Iferson, Maryland 21755
301-371-9172 • FAX 301-371-9644

composting toilets — graywater systems

Clivus®
Clivus Multrum, Inc.
Authorized Representative

DESIGN GUIDELINES
GRAYWATER FLOWER BED SYSTEM
Residential/Experimental/MD,DE,VA,WV
December, 1996

The Hanson Associates Graywater Flower Bed safely uses graywater to irrigate and fertilize site vegetation. It is designed to compliment a totally separate composting toilet system which converts human body products into compost and liquid fertilizer, also for beneficial use on site vegetation. With the composting toilet/graywater flower bed system, there is no sewage, no septage, and no groundwater pollution. The system is a permanent, low cost, low maintenance, reduced size, and beneficial, alternative to a septic system.

I. THE IRRIGATION TROUGH DISTRIBUTION SYSTEM (see Detail, attached)

A. Construction: Pressure treated lumber or Trex wood/polymer composite lumber walls; open bottom; openable white cedar (non warping) lid; stainless steel screws.

B. Sizing

1. General: shall be long and narrow to maximize root zone access.

2. Formula: 150 gpd/BR (standard design flow for sewage) x 50% for composting toilets, low flow shower heads, and no garbage grinder = 75 gpd/BR ÷ 2.5 gpd/sq ft for low pollutant load (approximately double the soil application rate for sewage in soils with a 2-30 minute perc rate) = 30 sq ft/BR soil absorbtion area, or trough bottom area, required (about 75% less that required for sewage).

3. Typical: 30 sq ft/BR = 2 - 1 ft wide x 15 ft long troughs per bedroom. For a 3 bedroom house there would be 6 - 1 ft wide x 15 ft long troughs. More troughs may be used in order to irrigate a larger area.

C. Installation: must be level to accept flooding dose; may need stabilization stakes if in fill soil; graywater to soil interface to be 6 in. below grade.

II. SITING

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A. Growing area required: allow a minimum 1 ft wide growing area along each side of the trough; a 30 sq ft trough (1 BR) including 30 sq ft on each side for growing area = 90 sq ft; estimate 100 sq ft/BR or 300 sq ft of growing area for a typical 3 BR house.

B. Shall blend with landscape; along side of structure; parallel to property line, sidewalk, hedge row, or natural or architectural borders; terraced into hillside, etc.

C. Should have southern exposure and wind protection for warmth.

D. Horizontal Separation Distance shall be 50% of the distances required for sub-surface sewage disposal, including: 12.5 ft to steep slopes, drainage ways, rock outrops; 50 ft to streams and water wells in unconfined aquifers; 25 ft to water wells in confined aquifers.

E. The treatment zone shall be the root zone and shall have an unsaturated depth of 2 ft below the graywater to soil interface (2 ft 6 in. below grade) with a perc rate of 2-30 minutes/inch taken at 6 in. below grade.

F. Topsoil fill may be used to level the trough, to gain an adequate treatment zone, to create a large basal absorbtion area so that natural soils with a perc rate slower than 30 minutes/inch can be used without increasing the trough size, or for landscaping aesthetics. Fill soils shall be good quality sandy loam top soil capable of supporting an active root zone, and may be contained with durable waterproofed retaining walls, or graded off at a slope not to exceed 3:1 (33%).

III. THE FLOODING DOSE

A. Sizing the Dose

1. General: The dose volume shall be small in order to avoid septic conditions, yet large enough to flood the soil interface in the trough to a minimum depth of 1.5 in. (225 gpd/3 BR house ÷ 24 hr/day = 9.4 g/hr x 3 hr maximum desirable retention time = 28 gallon/dose)

2. Formula: Trough width x trough length, converted to square inches, x flooding dose depth, divided by 231 cu in/gal = the flooding dose.

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3. The typical dose is 28 gallons: 30 sq ft of interface (1 BR; 2 - 1 ft x 15 ft troughs) x 144 sq in/sq ft = 4,320 sq in of interface x 1.5 in minimum flooding dose depth = 6,480 cu in ÷ 231 cu in/gallon = 28 gallons.

B. The dosing chamber shall be sized to accept the dose, a high water alarm 3" above the pump-on level, and an additional full dose above the high water alarm; typical size - 100 gallon.

C. The dosing pump shall be an effluent pump capable of passing 1/2 in. solids and sized to deliver the specified dose to the trough(s) with a minimum of 2 ft of head at the discharge point. The pump shall be positioned so as to deliver all graywater solids to the trough.

D. Dosing to two or more troughs can be accomplished by using a controller set to open motorized ball valves in sequence with each pump-on event, or by using duplex or triplex pump systems.

E. Multiple discharge points for the same dose must be at the same elevation and should be at least 1 pipe size smaller than the force main.

F. Each discharge point shall have a splash block.

G. Install ball valves as needed to control discharge erosion or equalize multiple discharges.

H. A water meter or event counter shall be installed to determine actual graywater flow excluding hose bibbs.

IV. VEGETATION

A. A minimum growing area 1 foot wide around the outside of each trough shall be maintained.

B. All types of vegetation, including flowering annuals, grass, weeds, vegetables, shrubs, and small trees, are likely to thrive and perform adequately in removing nutrients from the graywater.

C. Preferred vegetation includes:

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1. Evergreen perennials-in order to maintain an active root zone year round
2. Plants at least 2-3 feet high in order to maintain a root zone size similar to the graywater wetted area.
3. Fast growing plants that love fertile, wet soils.
4. Avoid acid loving plants--graywater is usually slightly basic.
5. Avoid root crops that may be eaten raw.

V. OPERATION

A. The dosing system is fully automatic.

B. Use only biodegradable non-sodium based cleaners; the best are "biocompatible" (tested on plants -- such as Oasis Products available from Real Goods, Inc., 1-800-762-7325)

C. All garbage and grease goes into the composter, not into the graywater system.

VI. MAINTENANCE -- every 6 months or when composting toilet is serviced

A. Check dosing system for proper operation.

B. Check vegetation condition--add plants, pull weeds, thin, prune, harvest as needed for aesthetics, trough lid access, and nutrient removal. Vegetaton that dies during the growing season is either too sensitive or indicates too much sodium or toxics in the graywater.

C. Check graywater-to-soil interface (inside trough) for proper characteristics: color of wet soil; rough, perforated texture from soil biological activity; presence of hair, lint or food particles from recent dose; presence of decomposer organisms such as ants, sow bugs, earthworms and their castings, spiders, centipedes, etc.; presence of roots or root hairs; deposit on side walls indicating proper flooding dose depth of 1.5 inches. If these characteristics are present, DO NOT DISTURB!

D. Check graywater to soil interface for even distribution of the flooding dose--add soil, subtract soil, rake, level, tamp, as needed.

E. A thin, gray biomat may appear on the whole interface area during the cold season and is normal. If the biomat is over one-quarter inch thick or black, then the system should be checked for toxics in flow, too high flow,

malfunctioning dose operation, uneven dose distribution, or mistakes in design or construction.

VII. PLANS, typical (attached)

A. Detail, Graywater Irrigation Trough
B. Site Plan, Graywater Irrigation Trough
C. Profile Plan, Graywater Irrigation Trough

VIII. REFERENCE, available upon request
A. Rationale - Graywater Design Criteria
B. Land Application of Clivus Liquid Fertilizer

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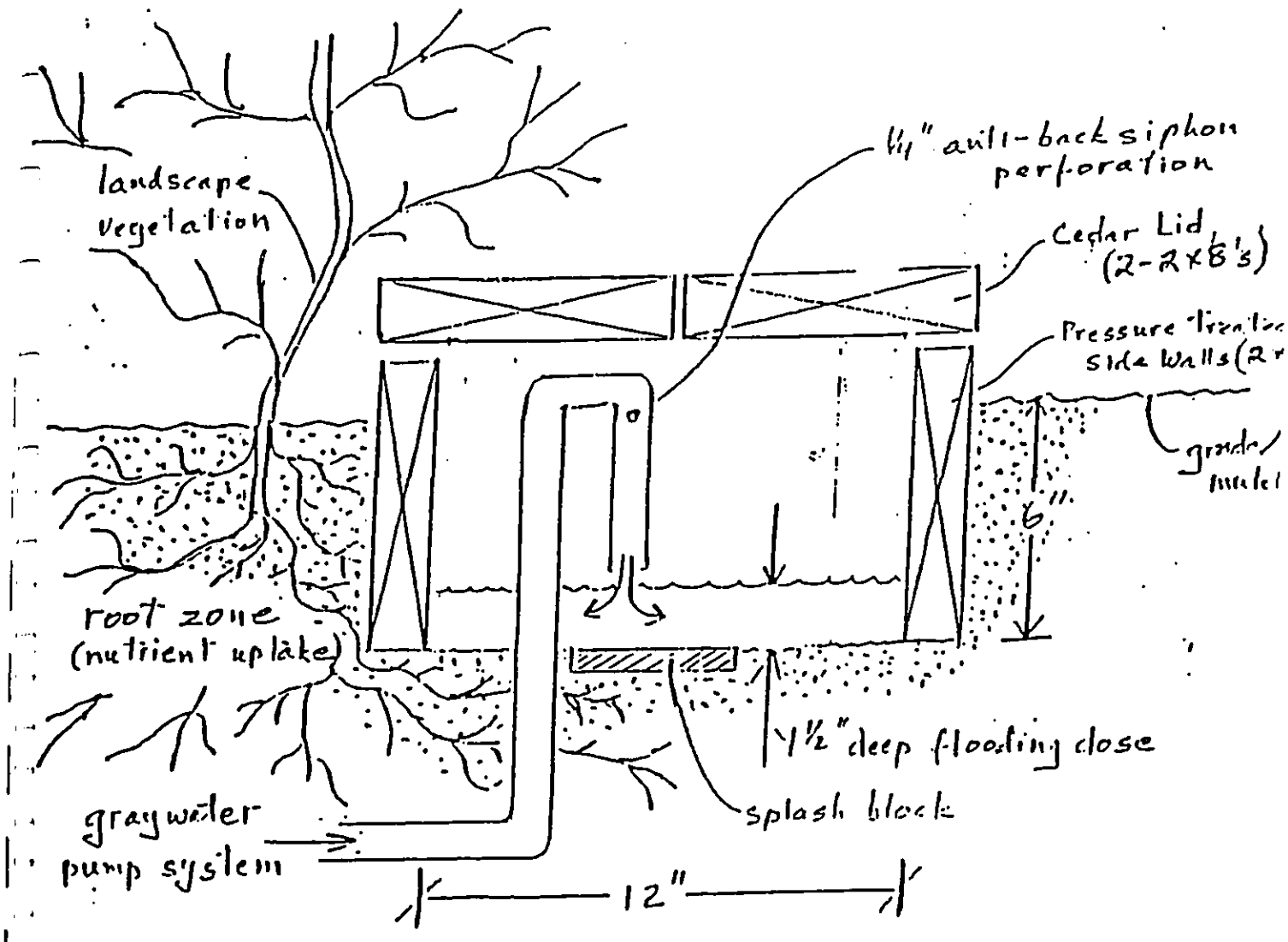
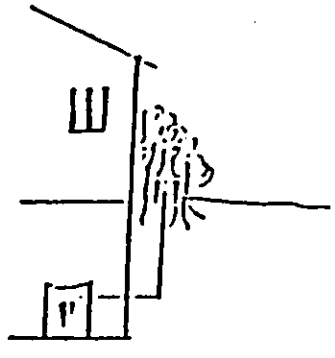
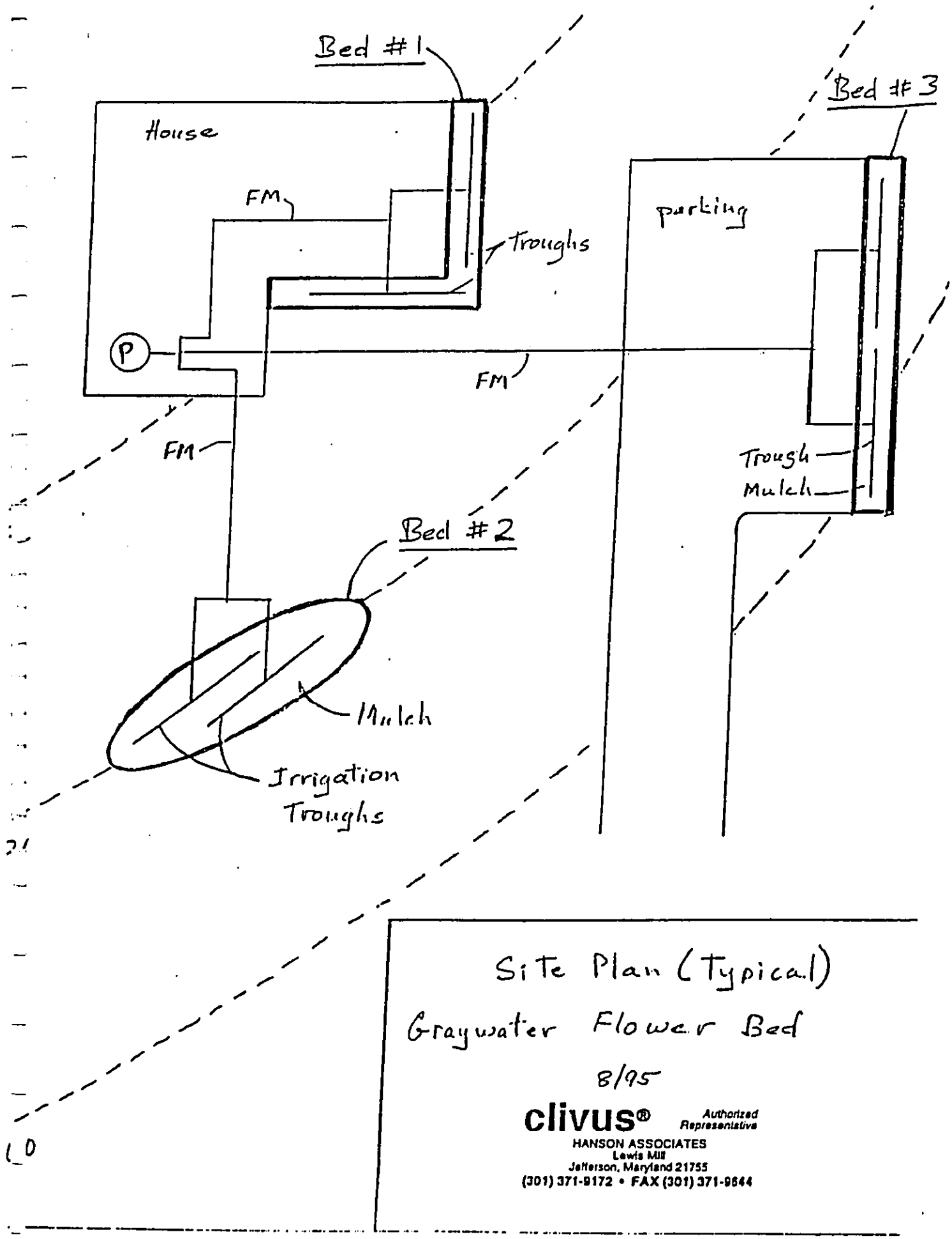


- No septic tank -- hair, grease, food particles decompose at interface
- High loading rates -- shallow interface has high microbial, invertebrate, and root zone activity to prevent biomat growth
- Flooding dose distribution system -- no perforations to clog
- Free access -- lid opens for observation and easy maintenance



Detail (Typical)

· Graywater Irrigation Trough
8/95

clivus® Authorized Representative
HANSON ASSOCIATES
Jefferson, Maryland 21755
(301) 371-9172 • FAX (301) 371-0844

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