

**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
Honolulu, Hawai'i**

File No: HA-3797
180-Day Exp. Date: November 6, 2017

October 13, 2017

**Board of Land and
Natural Resources
State of Hawai'i
Honolulu, Hawai'i**

REGARDING: Conservation District Use Application (CDUA) HA-3797 for a Single Family Residence; Agriculture Use and Management Plan; After-The-Fact Landscaping; and Associated Improvements

**APPLICANT/
LANDOWNER:** Garrett B. Dearing

LOCATION: Keonepoko Iki, Puna, Hawai'i

**TAX MAP KEYS
(TMKs):** (3) 1-5-009:055

AREA OF PARCEL: 6.79 acres

USE: 6.79 acres

SUBZONE: Resource

DESCRIPTION OF AREA/CURRENT USE

The project area is an undeveloped parcel of land located in the Resource Subzone of the State Land Use Conservation District (**see Exhibit 1**). It is located makai of the Government Beach Road in Keonepoko Iki, northwest of the Hawaiian Shores subdivision (**see Exhibit 2**). The property is flanked by similarly size private parcels that currently have no active land uses. According to the applicant, the property was almost entirely bulldozed in the mid-20th century in association with a former coconut farm. Since then, a primarily alien forest has established. The property is currently accessed by a gravel lined driveway off of Government Beach Road (**see Exhibit 3**).

The property is located on the flank of Kīlauea and the lava flows of this area are all derived from eruptive vents of Kīlauea's East Rift Zone, located as close as 4 miles east of the project site. The specific lava flows that underlie the project site erupted between 200 and 450 years. The lower 10 to 15 feet of shoreline bluff consists of a complex of a'a flow lobes while the remaining site is a buildup of breccia. Capping this flow is a thick layer of pahoehoe that may have erupted 360 years ago. The flow ranges in thickness from one to three feet.

Soil in the area is classified with the Malama series which is characterized as deep, well drained soils consisting of organic material over fragmental a'a lava substrata at a shallow depth. The specific soil is Malama extremely cobbly highly decomposed plant material. This type of soil has limitations that make it unsuitable for cultivation and restricts its use to pasture, range, woodland or wildlife.

The entire island of Hawai'i is subject to geological hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey (USGS) in this area of Puna is Zone 2 on a scale of ascending risk 9 to 1. The relatively high hazard risk is because Kīlauea is an active volcano. Zone 2 includes those areas adjacent to and downslope of active rift zones.

In terms of seismic risk, the entire Island of Hawai'i is rated Zone 4 Seismic Hazard by the Uniform Building Code (1997 edition). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built.

According to the Federal Insurance Rate Map (FIRM), while the FIRM map for the project area (Map No. 1551661150C) has not been printed, the property is classified as being in Flood Zone X, signifying areas outside of the mapped 500-year floodplain and with minimal risk from tsunami inundation.

A coastal erosion study was conducted for the property. The coastal erosion study found that the shoreline of the property consists of an elevated coastal shelf with gentle inlet development in a rocky shoreline primarily of a'a lava and related breccia. The shelf exhibits considerable strength and resistance to erosion, though evidence of undercutting and collapse over a period of centuries is plentiful. Air and satellite imagery show no clear evidence of significant erosion, at least since the mid-1960s. Measured rates of tectonic subsidence and project sea level rise do not appear to pose immediate threats to the landscape atop the shelf. The most cautiously estimated average coastal retreat was estimated to be 0.36 feet per year, based upon dividing the distance of maximum geological shoreline retreat with the age of the youngest lava flow exposed at the coast.

The natural vegetation of this part of the Puna shoreline was mostly coastal forest and strand vegetation, dominated by naupaka (*Scaevola taccada*), hala (*Pandanus tectorius*), 'ōhi'a (*Metrosideros polymorpha*), nanea (*Vigna marina*), and various ferns, sedges, and grasses. However, the applicant states that the existing site was bulldozed many decades ago and since then, growth of an alien-dominated forest took over the property, although some hala has grown back. In addition, previous visits to this general area had identified several clusters of *Ischaemum byrhone*, a state and federally listed endangered grass known to grow on pahoe-hoe lava close to the edge of sea cliffs, where salt spray may limit other plants.

Aside from scattered hala and one remnant 'ōhi'a tree near Government Beach Road, all trees found on the project site are non-native. The shoreline vegetation is dominated by hala, naupaka, and ironwood trees (*Casuarina equisetifolia*). Several native hapu'u (*Cibotium glaucum*) and ama'u (*Sadleria cyatheodes*) tree ferns were also found intermingled in the naupaka. The interior of the property is covered by tree species that typically dominate disturbed areas of Puna: Chinese banyan (*Ficus microcarpa*), cecropia (*Cecropia obtusifolia*), autograph tree (*Clusia rosea*), macaranga (*Macaranga mappia*), albizia (*Falcataria moluccana*), gunpowder tree (*Trema orientalis*), and ironwood. Non-native pilau maile (*Paederia foetida*) and pothos (*Epipremnum aureum*) vines festoon can be found up in the trees and, in some areas, the ground.

Birds common to the area were observed, including Common Myna (*Acridotheres tristis*), Japanese White-eye (*Zosterops japonicas*), and House Finch (*Carpodacus mexicanus*). No native birds were identified during the survey, however, the Hawai'i 'Amakihi (*Hemignathus virens*) is possible present in the general area, as some population of this native honey creeper appear to have adapted to the mosquito borne diseases of the Hawaiian lowlands. Also, common shorebirds such as the Golden Plover (*Pluvialis fulva*), Ruddy Turnstone (*Arenaria interpres*), and Wandering Tattler (*Heteroscelus incanum*) are often seen on the Puna coastline feeding on shoreline resources. While these shorebirds were not observed during site visits, they are likely to be found in the coastal area during the winter months, as the areas makai of the property's shoreline offers a reasonably good habitat for shorebirds. As with all of East Hawai'i, several endangered, native terrestrial vertebrates may be present in the general area and may overfly, roost, nest, or utilize resources of the property. These include the endangered Hawaiian Hawk (*Lasiurus cinereus semotus*), the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffinus newelli*).

Other mammals in the project area are all introduced species, including feral cats (*Felis catus*), feral pigs (*Sus scrofa*), small Indian mongoose (*Herpestes a. auropuncatus*) and various species of rats (*Rattus spp.*)

An archaeological inventory survey (AIS) of the property was conducted in July 2016. As a result of the survey, one unrecorded site (Site 50-10-45-30571), a historic wall with an unusual two-tiered construction, was recorded in the makai portion of the study area. The wall measures 8.7 meters long by 3 meters wide, and has a maximum height of 1.6 meters. In a better effort to understand the function, age, and construction characteristics of the wall, a 1x1 meter test unit was excavated into the approximate center of the lower tier. Based on the construction characteristics of the wall (core-filled with chinked spaces between the courses), indicated that the primary use of the location likely occurred during mid-twentieth century. The orientation of the wall strongly suggests that the wall was built to block to the often strong, prevailing trade winds. Further, this area may have been more level in the past, and served as an area suitable for short-term camping by fisherman accessing the adjacent coastline. It is also possible, given the height of the wall, that in addition to blocking the wind, it may have helped support a lean-to-structure that sheltered the area.

A Cultural Impact Assessment (CIA) was also conducted for the property in October 2016. The CIA notes that according to the manager of the remaining lands that were formerly a part of the Kekoa Grant, the subject property (which was a part of the Kekoa grant in its entirety) was once used for cattle ranching, and as a part of that activity, a coastal road was created by his grandfather. However, the CIA states that consultation with this person did not produce any evidence that the project area was used for traditional cultural activities during his (beginning in the 1950s), and likely his family's tenure (beginning in the 1920's). In addition, it is recognized that the shoreline areas of Puna can be regularly accessed for recreation and fishing in both traditional and non-traditional contexts. The applicant and his family have also observed people using the lower coastal shelf area to access areas for fishing and 'opihi picking.

There are currently no utilities serving this property.

PREVIOUS ENFORCEMENT ACTION

In January 2017, OCCL opened an investigation into alleged unauthorized landscaping on Conservation lands. Based upon information provided in an earlier CDUP Application for the

property, it was discovered that landscaping may have occurred on the property without the proper permits and/or approvals. Upon further investigation of the matter, the Department issued a Notice of Civil Resource Violation (ENF OA 17-30) on February 24, 2017 in which the landowner was fined \$1,000.00 for unauthorized landscaping. Further the landowner was required to file for an After-the-Fact Site Plan Approval (SPA) for the landscaping use. This current CDUA is meant to satisfy the requirement for the After-the-Fact SPA.

PROPOSED USE

The landowner is proposing the following uses (see Exhibit 4):

- A 4,922 square foot, single story SFR on the makai side of an existing, vacant lot (see Exhibits 5 & 6). The proposed SFR will be of slab on grade construction and be approximately 20 feet tall. The home will have three (3) bedrooms, three (3) baths, a kitchen, a study, a dining room, a living room, a laundry room, a garage, and various lanais, porches, and decks. There will also be an attached garage and a swimming pool. The SFR will be set back a minimum of 100 feet from the edge of cliff (elevated coastal shelf) based upon an average shoreline erosion rate of 0.36 feet per year. Access to the SFR will be provided via a paved 610 foot long and 12 foot wide driveway (most of which is existing as a gravel paved driveway) which will lead to a 2,800 square foot turnaround area near the front of the SFR.

The swimming pool will use a cartridge-filter/saltwater system that does not required any back-washing. The pool would be require draining very infrequently, but when it does need to be drained, it will be drained into a lava sump that will be located mauka of the pool site so as to be well removed from the shoreline area.

- A 5 acre farm comprised of banana, mango, citrus, durian, avocado, lychee and coconut trees is proposed on the mauka side of the property. The farm will also include a 713 square foot "barn" structure that will be approximately 13 feet high (see Exhibits 7 & 8). The barn will accommodate tractor parking, a fertilizer/pesticide storage room, a bathroom, and tool storage. A 50 foot long, 12 foot wide paved driveway would lead to a 2,100 square foot turnaround area near the barn. The applicant notes that the farm will be operated as a family farm for the family's use. The farm will not be used for commercial purposes.

Also associated with the farm, is a drainage and irrigation reservoir that will be created in an area where there is an existing berm and natural depression which would then be expanded and enhanced to effectively serve as a retention area for potential site runoff, as an irrigation reservoir for the farm use, and to provide additional fire-flow protection to the proposed barn as well as the proposed SFR. The drainage pond/irrigation reservoir would encompass approximately 9,600 square feet and have an average depth of four feet. The basin would be lined with sand, followed by a 20-guage, vinyl-beaded liner to create an impervious base. Irrigation of the cultivated areas will be handled primarily by means of sprinklers and supplemental watering. Irrigation stands will be located at the irrigation reservoir and at the barn. Irrigation lines will be extended to portions of the cultivated areas as needed.

In the area planned for cultivation, invasive albezia, octopus, gunpowder, and strawberry guava trees are proposed to be removed by hand and disposed of onsite by chipping or burning. Weedy vines, including maile pilau, pathos, and philidendrdom will also be removed and discarded similarly.

A farm management plan has been prepared as a part of this application. Best Management Practices (BMPs) include short-term practices meant to control erosion and sedimentation related to the relatively small amount of proposed ground disturbing activities as well as long-term practices related to soil management and other farm practices (see **Exhibit 9**).

The following schedule of activities is proposed once the applicant has secured all necessary permits and approvals:

Action	Time-Frame*
Removal of trees from planned construction areas	1 month
Removal of trees from planned areas of tree plantings	Ongoing (years 1-3)
Grading within defined construction areas	2-3 months
Construction of drainage improvements/irrigation pond	3 months
Well construction	3-4 months
Implement irrigation related improvements	4 months
Barn construction	5-8 months
Tree plantings	Ongoing (years 1-3)

*occurring in months/years following receipt of required permits and approvals

- General landscaping (new and after-the-fact) (see **Exhibit 10**). This will include the list of plants as provided in **Exhibit 11**, associated with the previous enforcement action, as well as a continuation of the existing plantings along the driveway, around the proposed SFR, and incorporation into the farm landscaped, except for those particular plants where there may be an indication of having invasive or weedy characteristics. Landscaping activities will also include the removal of six (6) hala trees and several non-native trees will need to be removed for the construction of the SFR. However, the hala trees will be relocated towards the periphery of the site. Approximately 20 ironwood trees between the proposed SFR and elevated coastal are proposed for removal while the remaining ironwoods will be thinned and trimmed. The debris and logs will be chipped, composted, and used onsite for mulch as a part of the farm operation. The area will be replanted with hala. It is expected that, with the removal of the ironwoods, the native naupaka will gradually extend into this area so that the vegetation will eventually include a mix of native species.
- Installation of two inch PVC irrigation lines with sprinklers and smaller lines throughout the cultivated area.
- Installation of underground electrical power and CATV lines that will be connected to existing HELCO and CATV lines that run along the Government Beach Road.
- Installation of 2 onsite water wells; the primary well located in the center of the property, near the barn and a secondary one located 250 feet makai of the primary well. In addition, a 2,000 gallon storage tank will be located within the barn, with an additional 1,500 gallon storage tank locate within the SFR garage. The proposed storage is expected to be more than adequate to meet the expected demand, based on the family's prior monitored use of less than 120 gallons per day.

- Installation of two septic systems (one for the SFR and one for the barn) designed in conformance with the requirements of the Department of Health.

Because of the location and nature of the project relative to sensitive vegetation and species, the applicant has marked the existing, endangered grass clumps *Ischaemum byrone* with flagging and protected from trampling for the time being. According to the applicant, they will be marked again prior to any tree-trimming or tree removal activity in the area and monitored to ensure that the clusters are not impacted during these activities. After this, each clump will be surrounded with a ring of local rocks to prevent inadvertent trampling in the future.

Further, in order to avoid impacts to the endangered terrestrial vertebrates identified, the applicant will adhere to the following:

- Refrain from construction activities that disturb or remove vegetation between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance;
- If land clearing occurs between March 1 and September 30, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian Hawks are present, no land clearing will be allowed until October, when hawk nestlings will have fledged;
- Any and all exterior lighting will be shielded downwards, in conformance with Hawai'i county Code §14-50 et seq., to minimize the potential for disorientation to seabirds.

In addition, given that this is a shoreline property, the applicant understands that there are hazards associated with homes at risk from sea level rise. Therefore the applicant would agree to a CDUP and/or deed condition that would prevent any future request for shoreline hardening to protect the residence, regardless of hardship, and a condition requiring moving or dismantling the home if sea level rise eventually threatens the integrity of the structure.

Regarding historic and cultural resources, as stated earlier, the AIS prepared for the project discovered an unrecorded historic site; a historic wall with an unusual two-tiered construction, located in the makai portion of the study area. As it is the applicant's intent to for the wall to be demolished and that the site was fully documented during the archaeological survey, the AIS concluded that no further historic preservation work is recommended. Further, the State Historic Preservation Division (SHPD), by letter dated May 26, 2017, concurred with the findings of the AIS and accepted the report.

In addition, the CIA prepared for the project concluded that given the negative findings of the study with respect to identification of any traditional cultural practices and properties, or any specific valued cultural, historic, or natural resources, the project will not have a significant cultural impact. However, the applicant does recognize that the shoreline area is regularly accessed for recreation and fishing in both traditional and non-traditional contexts. The proposed project is not anticipated to have any impacts to the public access of the shoreline within the project vicinity.

OTHER ALTERNATIVES CONSIDERED:

Alternative 1: No Action alternative. This alternative would preserve the status quo of the property which would remain an undeveloped lot. This alternative would not be viable as it would deprive the landowners of a reasonable use of their property.

Alternative 2: Alternative House Sites and Alternative Uses. Some other locations on the property could also serve as the site for a residence, but none have the advantages of the proposed site in terms of breezes and views, while both avoiding impacts to native shoreline vegetation and offering a location for the farm and its infrastructure.

SUMMARY OF COMMENTS

The Office of Conservation and Coastal Lands referred the application, as well as the Draft Environmental Assessment (EA) to the following agencies and organizations for review and comment:

State Agencies:

DLNR, Division of Conservation and Resource Enforcement
DLNR, Division of Forestry and Wildlife
DLNR, Historic Preservation Division
DLNR, Hawai'i District Land Office
Department of Health
Office of Hawaiian Affairs

County Agencies:

County of Hawai'i, Department of Planning
County of Hawai'i, Fire Department

Other Individuals/Organizations:

Malama O Puna

In addition, this application was also sent to the nearest public library, the Pahoia Public & School Library, to make this information readily available to those who may wish to review it.

Comments were received by the following agencies and individuals and summarized by Staff as follows:

THE STATE

DEPARTMENT OF LAND AND NATURAL RESOURCES

Land Division: No Comments

DEPARTMENT OF HEALTH

Environmental Planning Office

Comments: In the development and implementation of all projects, EPO strongly recommends the regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: <http://health.hawaii.gov/epo/landuse>. Projects are required to adhere to all applicable standard comments. EPO has recently updated the environmental Geographic Information Systems GIS website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: <http://health.hawaii.gov/epo/egis>.

EPO encourages you to examine and utilize the Hawai'i Environmental Health Portal at <https://eha-cloud.doh.hawaii.gov>.

Please note that all wastewater plans must conform to applicable provisions. We reserve the right to review the detailed wastewater plans for conformance to applicable rules.

Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting. DOH approval must be obtained before any injection well construction commences. An Underground Injection Control (UIC) permit must be issued before any injection well operation occurs.

Any construction waste generated by the project needs to be disposed of at a solid waste disposal facility that complies with the applicable provisions. The open burning of any of these wastes, on or off site, is strictly prohibited.

You may wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: <http://eha-web.doh.hawaii.gov/oeqc-viewer>. This viewer geographically shows where some previous Hawai'i Environmental Policy Act (HEPA) documents have been prepared.

EPO encourages you to explore, launch, and utilize the EPA's new environmental justice mapping and screening tool called EJSCREEN which can be found at <http://epa.gov/ejscreen>.

Sea level rise and the associated coastal impacts have the potential to harm an array of natural and built environments in Hawai'i. EPO encourages you to visit the following informative links:

- State of Hawai'i climate Adaptation Portal: <http://climateadaptation.hawaii.gov>
- University of Hawai'i, Mānoa, School of Ocean and Earth Science and Technology, Coastal Geology Group: <http://www.soest.hawaii.edu/coasts/index.html>

Applicant's response: During the development of the EA, many of these sources were consulted, and the website from the HEER office provided information on the potential for hazardous materials. It should be noted that during construction, the contractor will be required to comply with all applicable administrative rules. No injection well will be required, and the determination on whether an NPDES permit is required will occur after final grading plans have been developed. The proposed house and farm have been designed with energy efficiency and sustainable agriculture in mind. The home would be set back a minimum of 100 feet from the shoreline at an elevation of about 25 feet above sea level, and is not likely to be especially vulnerable to sea level rise of the increased hurricane activity expected over the next 50 years.

COUNTY OF HAWAI'I

COUNTY OF HAWAI'I PLANNING DEPARTMENT: *No Comments*

COUNTY OF HAWAI'I, FIRE DEPARTMENT

Comments: The Fire Department provided a list of various codes that the project must be in accordance with pursuant to Chapter 18, *Fire Department Access and Water Supply*, of the NFPA 1, Uniform Fire Code, 2006

Applicant's response: The owner and his family have been in contact with Battalion Chief Robert Perreira of the Hawai'i Fire Department to review their plans and the Fire Code requirements for the planned SFR and farm-related activities in order to ensure that the improvements to the property are planned and designed in compliance with the applicable code requirements.

INDIVIDUALS

MR. KEN CHURCH

Comments: If the existing orchard plantings on the property can be evidenced that pre-dates the property's zoning into the State Conservation District, such a historic use remain allowed as a non-conforming land use. It is clear that the County zoning of the property was agriculture. It appears that the EA has identified fruit trees being planted on a substantial area of the property prior to it being within the Conservation District. Therefore, based on HAR Chapter 13-5 no permit is required and thus no management plan would be required either. It would appear to me that your application does not necessarily require a CDUP for the agriculture use.

The house appears to be a single family "farm dwelling" which OCCL has required to be referred to as a SFR as there appears to be difference between the two. Correspondence file HA 17-02 seemingly requires that the applicant submit two CDUAs; one for the SFR and one for the agriculture use. This is inconsistent with the guidelines that has generally been required by the OCCL that when possible, the entire plan of an applicant's use of the property should be submitted in its entirety so that its entire effect on the environment may be determined rather than the sequential effect. The sequential approach could seemingly permit one use and not the other.

Applicant's response: Regarding agriculture as a non-conforming use on the property, although a case can be made that the proposed farm is simply a continuation of a non-conforming use, the plantings have since reverted to jungle and the documentary evidence of the farming is somewhat scant. As such, the applicant believed that a CDUA was the most appropriate mechanism. Regarding the farm dwelling, although the applicant does intend to conduct farming activities while living in the proposed residence, he did not wish to have its use restricted to being a farm dwelling. Finally, regarding the need for one or two CDUAs, the proposed uses are being requested in one integrated CUDAs and analyzed in one EA.

ANALYSIS

Following review and acceptance for processing, the Applicant was notified, by correspondence dated March 8, 2017 that:

1. The proposed use is an identified land use in the Resource subzone of the Conservation District, pursuant to §13-5-24, Hawaii Administrative Rules (HAR), R-7, SINGLE FAMILY RESIDENCE, (D-1) *A single family residence that conforms to design standards as outlined in this chapter* and HAR §13-5-23, L-1, AGRICULTURE, (D-1) *agriculture, within an area of more than one acre, defined as the planting, cultivating, and harvesting of horticultural crops, floricultural crops, or forest products, or animal husbandry. A management plan approved simultaneously with the permit, is also required.*
2. Pursuant to HAR §13-5-40 HEARINGS, a Public Hearing will not be required.
3. In conformance with Chapter 343, Hawai'i Revised Statutes (HRS), as amended, and HAR, Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, an

Environmental Assessment (EA) for the project has been prepared and a Finding of No Significant Impacts (FONSI) is anticipated for the proposed project; and

4. The subject area is within the Special Management Area (SMA). The applicant's responsibility includes complying with the provisions of Hawai'i's Coastal Zone Management law (Chapter 205A, HRS) that pertain to the Special Management Area (SMA) requirements administered by the various counties. Negative action on this application can be expected should you fail to obtain and provide us, at least forty-five (45) days prior to the 180-day expiration date, one of the following:
 - An official determination that the proposal is exempt from the provisions of the county rules relating to the SMA;
 - An official determination that the proposed development is outside the SMA; or
 - An SMA Use Permit for the proposed development.

The Final EA/Finding of No Significant Impact (FONSI) was issued by the DLNR Chairperson and published in the August 23, 2017 edition of the Office of Environmental Quality Control's *The Environmental Notice*.

CONSERVATION CRITERIA

The following discussion evaluates the merits of the proposed land use by applying the criteria established in §13-5-30, HAR.

- 1) *The proposed use is consistent with the purpose of the Conservation District.*

The objective of the Conservation District is to conserve, protect, and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare.

The proposed use is an identified land use in the Resource subzone of the Conservation District; as such, it is subject to the regulatory process established in Chapter 183C, HRS and detailed further in Chapter 13-5, HAR.

Regarding endangered flora and fauna, the project site is home to endangered grass clumps of *Ischaemum byrone*. The clumps will be monitored to ensure that the clusters are not impacted during tree trimming and removal activities. After, each clump will be surrounded with a ring of local rocks to prevent inadvertent trampling in the future.

Further, in order to avoid impacts to the endangered terrestrial vertebrates identified, the applicant will need to adhere to the following:

- Refrain from construction activities that disturb or remove vegetation between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance;
- If land clearing occurs between March 1 and September 30, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian Hawks are present, no land clearing will be allowed until October, when hawk nestlings will have fledged;

- Any and all exterior lighting will be shielded downwards, in conformance with Hawai'i county Code §14-50 et seq., to minimize the potential for disorientation to seabirds.

In addition, the AIS prepared for the project discovered an unrecorded historic wall, which was fully documented during the archaeological survey. Therefore, the AIS concluded that no further historic preservation work is recommended and SHPD concurred with the findings of the AIS and accepted the report.

- 2) *The proposed land use is consistent with the objectives of the Subzone of the land on which the use will occur.*

The objective of the Resource subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas. The proposed land uses are identified land uses that can be applied for pursuant to §13-5-22 and §13-5-23, HAR. The proposed SFR shall be built to comply with all Federal, State and County regulations and shall be constructed in accordance with Chapter 13-5, Exhibit 4 Single Family Residential Standards while the proposed agriculture use shall conform to the proposed Farm Management Plan if approved by the Board.

- 3) *The proposed land use complies with the provisions and guidelines contained in Chapter 205A, HRS entitled "Coastal Zone Management", where applicable.*

The project area is located within the Special Management Area (SMA). The applicant received a SMA determination letter from the County of Hawai'i, Planning Department which stated that the proposed project is not considered "Development" as defined in Chapter 205A-22, HRS and Planning Commission Rule 9 relating to Special Management Area. However, the proposed land use complies with following Coastal Zone Management guidelines as follows:

- (1) *Recreational Resources:* As the property is a shoreline parcel, the applicant is committed to ensuring public access to the shoreline is not restricted in the area fronting his property. While there are no official public shoreline accesses from Government Beach Road, there are informal access trails to the west that connect the road to the shoreline which allow fishermen and 'opihi pickers to access fishing and gathering spots. While the project site does not have an official or unofficial trail either above or below the coastal shelf, the applicant has observed people traversing the shoreline below to gather 'opihi or to fish. The proposed project is not anticipated to have any impacts to the public access of the shoreline within the project vicinity.
- (2) *Historic Resources:* As mentioned earlier, the AIS prepared for the project discovered an unrecorded historic wall located in the makai portion of the study area. As it is the applicant's intent to for the wall to be demolished and that the site was fully documented during the archaeological survey, the AIS concluded that no further historic preservation work is recommended. SHPD concurred with the findings of the AIS and accepted the report.
- (3) *Scenic and Open Space Resources:* Currently, the property is overgrown with invasive species that are common to the area. The visual character pf the property will change to

that of a managed farm landscape with restoration of the native landscape in the coastal portion of the property. The proposed SFR and barn are planned in the interior of the property so as to be obscured from view from the adjoining properties.

- (4) *Coastal Ecosystems, (6) Coastal Hazards, (9) Beach Protection, & (10) Marine Resources:* The proposed project will use BMPs during construction and operations of the farm activity as provided in both the EA and Management Plan documents. Sewage will be disposed of in accordance with the requirements of the State Department of Health (DOH).

The applicant recognizes that the shoreline area is regularly accessed for recreation and fishing in both traditional and non-traditional contexts, however, the proposed project is not anticipated to have any impacts to the public access of the shoreline within the project vicinity.

Given that this is a shoreline property, the applicant understands that there are hazards associated with homes at risk of sea level rise. Therefore, the applicant has agreed to a permit or deed condition that would prevent any future request for shoreline hardening to protect the residence, regardless of hardship as well as condition that would require moving or dismantling the home if sea level rise eventually threatens the integrity of the structure.

- (7) *Managing Development & (8) Public Participation:* As a part of this permit process, the State and County agencies, as well as the public was notified of this application and was given the opportunity to comment.
- 4) *The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.*

Staff believes the proposed land use will not cause substantial adverse impacts to existing natural resources within the surrounding area, community or region provided that mitigative measures are implemented and the applicant shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard that the project may cause. Short-term impacts associated with construction activities such as potential noise and air quality are anticipated, however BMPs shall be implemented to mitigate any potential impacts. Further short-term and long-term BMPs shall be implemented to mitigate any potential impacts from the proposed farm operations as stated in the Management Plan prepared for the project.

Regarding endangered flora and fauna, the project site is home to endangered grass clumps of *Ischaemum byrone*. The clumps will be monitored to ensure that the clusters are not impacted during tree trimming and removal activities. Each clump will be surrounded with a ring of local rocks to prevent inadvertent trampling in the future.

Further, in order to avoid impacts to the endangered terrestrial vertebrates identified, the applicant will need to adhere to the following:

- Refrain from construction activities that disturb or remove vegetation between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance;
- If land clearing occurs between March 1 and September 30, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If

Hawaiian Hawks are present, no land clearing will be allowed until October, when hawk nestlings will have fledged;

- Any and all exterior lighting will be shielded downwards, in conformance with Hawai'i county Code §14-50 et seq., to minimize the potential for disorientation to seabirds.

Regarding the historic wall located in the makai portion of the study area, the site was fully documented during the archaeological survey and the AIS concluded that no further historic preservation work is recommended. SHPD concurred with the findings of the AIS and accepted the report.

Given that this is a shoreline property, the applicant understands that there are hazards associated with homes at risk of coastal flooding and sea level rise. Therefore, the applicant has agreed to a permit or deed condition that would prevent any future request for shoreline hardening to protect the residence, regardless of hardship as well as condition that would require moving or dismantling the home if sea level rise eventually threatens the integrity of the structure.

- 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.*

Staff is of the opinion that the proposed project will be compatible with the locality and surrounding areas and is appropriate to the physical conditions and capability of the specified parcel.

- 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.*

Currently, the property is overgrown with invasive species that are common to the area. The visual character of the property will change to that of a managed farm landscape with restoration of the native landscape in the coastal portion of the property. The proposed SFR and barn are planned in the interior of the property so as to be obscured from view from the adjoining properties.

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

No subdivision of land is proposed.

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

Staff believes the proposed land use will not be materially detrimental to the public health, safety and welfare as mitigated. With the incorporation of an appropriately designed and operated individual wastewater system, combined with other BMPs identified, the proposed residential land use will not result in materially detrimental impacts to public health, safety and welfare.

CULTURAL IMPACT ANALYSIS:

As discussed earlier, the AIS prepared for the project discovered an unrecorded historic site; a historic wall with an unusual two-tiered construction, located in the makai portion of the study area. As it is the applicant's intent for the wall to be demolished and that the site was fully documented during the archaeological survey, the AIS concluded that no further historic preservation work is recommended. Further, the State Historic Preservation Division (SHPD), by letter dated May 26, 2017, concurred with the findings of the AIS and accepted the report. In addition, the CIA prepared for the project concluded that given the negative findings of the study with respect to identification of any traditional cultural practices and properties, or any specific valued cultural, historic, or natural resources, the project will not have a significant cultural impact. However, the applicant does recognize that the shoreline area is regularly accessed for recreation and fishing in both traditional and non-traditional contexts. The proposed project is not anticipated to have any impacts to the public access of the shoreline within the project vicinity.

Staff notes that the Division of Historic Preservation and the Office of Hawaiian Affairs did not provide any comments nor were any comments received from the general public regarding native and/or traditional uses that may be infringed upon. To the extent to which traditional and customary native Hawaiian rights are exercised, the proposed action does not appear to affect traditional Hawaiian rights; it is believed that no action is necessary to protect these rights.

Staff believes valued cultural, historical or natural resources customarily or traditionally used by native Hawaiian's will not be adversely affected within the Conservation District should this land use be approved. The project will be conditioned that if cultural or archaeological resources are discovered, all work will cease and the Historic Preservation Division will be notified.

DISCUSSION

The proposed 4,922 square foot, single story SFR will be of slab on grade construction and be approximately 20 feet tall. The home will have three (3) bedrooms, three (3) baths, a kitchen, a study, a dining room, a living room, a laundry room, a garage, and various lanais, porches, and decks. There will also be an attached garage and a swimming pool. Staff notes that the pool will be a saltwater system pool that avoids the formation of chloramines and that the applicant has made an effort to ensure any maintenance draining take place mauka of the pool, thus avoiding impacts to nearshore waters. The proposed 5 acre farm will be comprised of banana, mango, citrus, durian, avocado, lychee and coconut trees and will also include a 713 square foot "barn" structure that will be approximately 13 feet high. Staff notes that a Management Plan was prepared pursuant to Chapter 13-5, Hawaii Administrative Rules, Exhibit 3. Also associated with the project are utility, drainage, landscaping, and irrigation improvements. Two separate septic systems will be installed, one for the SFR and one for the barn. Staff notes that the DOH requires septic systems to be located no closer than 50 feet from any body of water.

During construction of the project and operation of the farm, BMPs will be observed and implemented. Within the Environmental Assessment and proposed Management Plan (prepared according to Chapter 13-5, Hawaii Administrative Rules, Exhibit 3), the applicant has identified a number of mitigative measures, conditions, and practices to ensure that the proposal will have minimal effect on the natural resources that may be impacted by the proposed project. As such, these proposed measures, conditions and practices are incorporated into the permit. In addition, the

proposed SFR is consistent with Chapter 13-5, Hawaii Administrative Rules, Exhibit 4, Single Family Residential Standards.

This area along the Keonepoko Iki coastline includes both Agricultural and Conservation District land, located between two larger residential subdivisions. Along this stretch, however, there are only a few properties with SFRs and farms. The proposed structure and farm use has been designed to comply with the Single Family Residential Standards as outline in HAR, Chapter 13-5 and an Management Plan has been prepared pursuant to HAR, Chapter 13-5, Exhibit 3. Further several SFRs nearby were previously approved by the Board; one on Parcel 41 (CDUP HA-1233, approved on July 25, 1980), one on Parcel 36 (CDUP HA-1466, approved August 13, 1982), one on Parcel 39 (CDUP HA-1605 approved December 2, 1983), and the most recent one on Parcel 40 (CDUP HA-3233, October 28, 2005). Staff believes that the project will have negligible adverse environmental or ecological effects provided that best management practices and mitigation measures as described in the application, management plan, and environmental assessment, and as required by rule or laws, are fully implemented.

Please note that regarding the fulfillment of the after-the-fact SPA condition for ENF OA 17-30, Staff has reviewed the list of plants previously planted by the applicant and is recommending a condition that the applicant remove any Spathoglottis (orchids) and mock orange (*Murraya paniculata*) plants were planted as they have the characteristics of being invasive as indicated by the USDA Forest Service Pacific Island Ecosystems at Risk website. While Staff recognizes that the existing site has been described as being overgrown with invasive species that are common to the Puna area, the rules regarding landscaping in the Conservation District prohibit the introduction of invasive plant species (HAR §13-5-23, L-2).

Further Staff is requesting that the Board omit the requirement for annual reporting pursuant to Requirement 10 of Exhibit 3, Chapter 13-5, HAR due to the fact that the agriculture use is specifically for the landowner's family use and will not be used for commercial purposes.

In addition, as volunteered by the landowner, Staff is recommending a condition that the landowner forgoes any future requests for shoreline hardening to protect the residence, regardless of hardship and that in the event that coastal hazards (i.e. sea level rise) eventually threatens the integrity of the structure, the landowner will be required to move or dismantle the structure.

RECOMMENDATION

That the Board of Land and Natural Resources APPROVE Conservation District Use Application HA-3797 for an SFR, agriculture farm, and associated improvements and for After-The-Fact Landscaping, along with the associated Management Plan, located at Keonepoko Iki, Puna, island of Hawai'i, TMK (3) 1-5-009:055, subject to the following conditions:

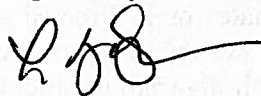
1. The permittee shall comply with all applicable statutes, ordinances, rules, and regulations of the federal, state, and county governments, and applicable parts of this chapter;
2. The permittee, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit;

3. The permittee shall comply with all applicable department of health administrative rules;
4. The single family residence shall not be used for rental or any other commercial purposes unless approved by the board. Transient rentals are prohibited, with the exception of wilderness camps approved by the board;
5. The permittee shall provide documentation (e.g., book and page or document number) that the permit approval has been placed in recordable form as a part of the deed instrument, prior to submission for approval of subsequent construction plans;
6. Before proceeding with any work authorized by the department or the board, the permittee shall submit four copies of the construction plans and specifications to the chairperson or an authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three of the copies will be returned to the permittee. Plan approval by the chairperson does not constitute approval required from other agencies;
7. Unless otherwise authorized, any work or construction to be done on the land shall be initiated within one year of the approval of such use, in accordance with construction plans that have been signed by the chairperson, and shall be completed within three years of the approval of such use. The permittee shall notify the department in writing when construction activity is initiated and when it is completed;
8. All representations relative to mitigation set forth in the accepted application and environmental assessment or impact statement for the proposed use are incorporated as conditions of the permit;
9. The permittee shall plan to minimize the amount of dust generating materials and activities. Material transfer points and on-site vehicular traffic routes shall be centralized. Dusty equipment shall be located in areas of least impact. Dust control measures shall be provided during weekends, after hours and prior to daily start-up of project activities. Dust from debris being hauled away from the project site shall be controlled. Landscaping and dust control of cleared areas will be initiated promptly;
10. The permittee shall notify the Office of Conservation and Coastal Lands (OCCL) in writing prior to the initiation and upon completion of the project;
11. Should historic remains such as artifacts, burials or concentration of charcoal be encountered during construction activities, work shall cease immediately in the vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact SHPD (692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary;
12. The permittee shall utilize Best Management Practices for the proposed project;
13. During construction, appropriate mitigation measures shall be implemented to minimize impacts to the aquatic environment, off-site roadways, utilities, and public facilities;

14. The single-family residence shall conform to the single-family residential standards included as Exhibit 4 of the Hawaii Administrative Rules, Chapter 13-5;
15. The permittee understands and agrees that the permit does not convey any vested right(s) or exclusive privilege;
16. In issuing the permit, the department and board have relied on the information and data that the permittee has provided in connection with the permit application. If, subsequent to the issuance of the permit such information and data prove to be false, incomplete, or inaccurate, this permit may be modified, suspended, or revoked, in whole or in part, and the department may, in addition, institute appropriate legal proceedings;
17. When provided or required, potable water supply and sanitation facilities shall have the approval of the department of health and the county department of water supply;
18. Where any interference, nuisance, or harm may be caused, or hazard established by the use, the permittee shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard;
19. Obstruction of public roads, trails, and pathways shall be avoided or minimized. If obstruction is unavoidable, the permittee shall provide alternative roads, trails, or pathways acceptable to the department;
20. During construction, appropriate mitigation measures shall be implemented to minimize impacts to off-site roadways, utilities, and public facilities;
21. The permittee shall obtain a county building or grading permit or both for the use prior to final construction plan approval by the department;
22. Artificial light from exterior lighting fixtures, including but not limited to floodlights, uplights, or spotlights used for decorative or aesthetic purposes, shall be prohibited if the light directly illuminates or is directed to project across property boundaries toward the shoreline and ocean waters, except as may be permitted pursuant to section 205A-71, HRS. All exterior lighting shall be shielded to protect the night sky;
23. The permittee acknowledges that the approved work shall not hamper, impede, or otherwise limit the exercise of traditional, customary, or religious practices of native Hawaiians in the immediate area, to the extent the practices are provided for by the Constitution of the State of Hawaii, and by Hawaii statutory and case law;
24. Any landscaping will shall be appropriate to the site location and shall give preference to plant materials that are endemic or indigenous to Hawai'i. The introduction of invasive plant species is prohibited;
25. The barn structure shall not be used for any residential purposes as a second dwelling or for rental or any other commercial purposes unless approved by the Board. Transient rentals are prohibited, with the exception of wilderness camps approved by the Board;

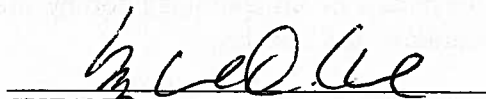
26. The farm and associated operations shall not be used for any commercial purposes unless approved by the Board;
27. That the permittee remove any *Spathoglottis* (orchids) and mock orange (*Murraya paniculata*) plants that were previously planted by the applicant in conjunction with ENF OA 17-30 as they have the characteristics of being invasive as indicated by the USDA Forest Service Pacific Island Ecosystems at Risk website.
28. Trees taller than 15 feet shall not be removed or trimmed during the Hawai'i Hoary bat birthing and pup rearing season from June 1st to September 15th;
29. If land clearing occurs between March 1 and September 30, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian Hawks are present, no land clearing will be allowed until October, when hawk nestlings will have fledged;
30. The landowner will forgo any future requests for shoreline hardening to protect the residence, regardless of hardship and that in the event that coastal hazards (i.e. sea level rise) eventually threatens the integrity of the structure, the landowner will be required to move or dismantle the structure;
31. That the Board omit the requirement for annual reporting pursuant to Requirement 10 of Exhibit 3, Chapter 13-5, HAR.
32. Other terms and conditions as may be prescribed by the Chairperson; and
33. Failure to comply with any of these conditions shall render this Conservation District Use Permit void under Chapter 13-5, as determined by the chairperson or board.

Respectfully submitted,





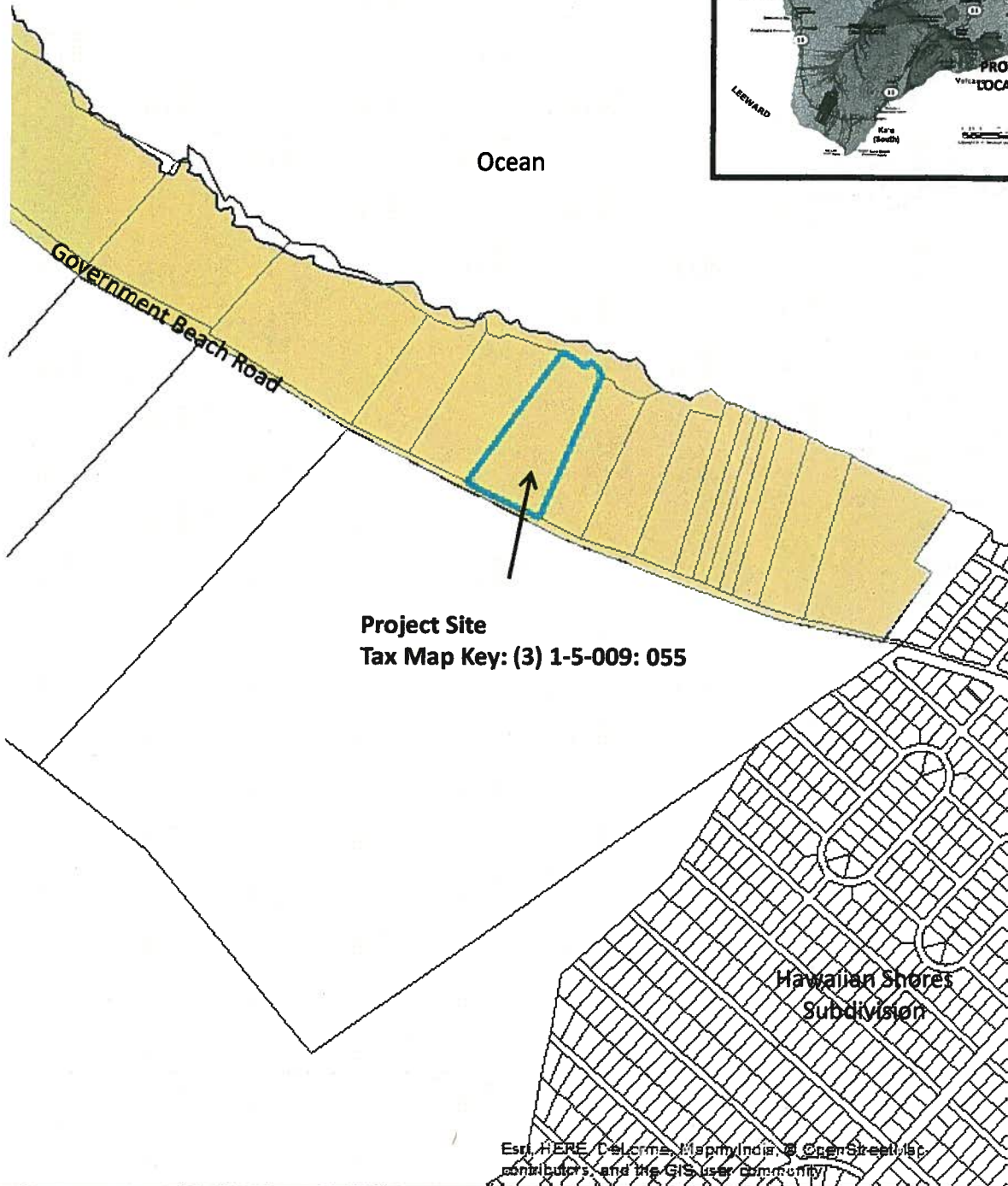
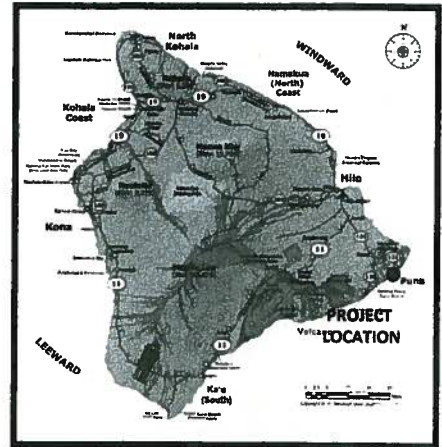
Lauren Yasaka, Staff Planner
Office of Conservation and Coastal Lands

Approved for submittal:

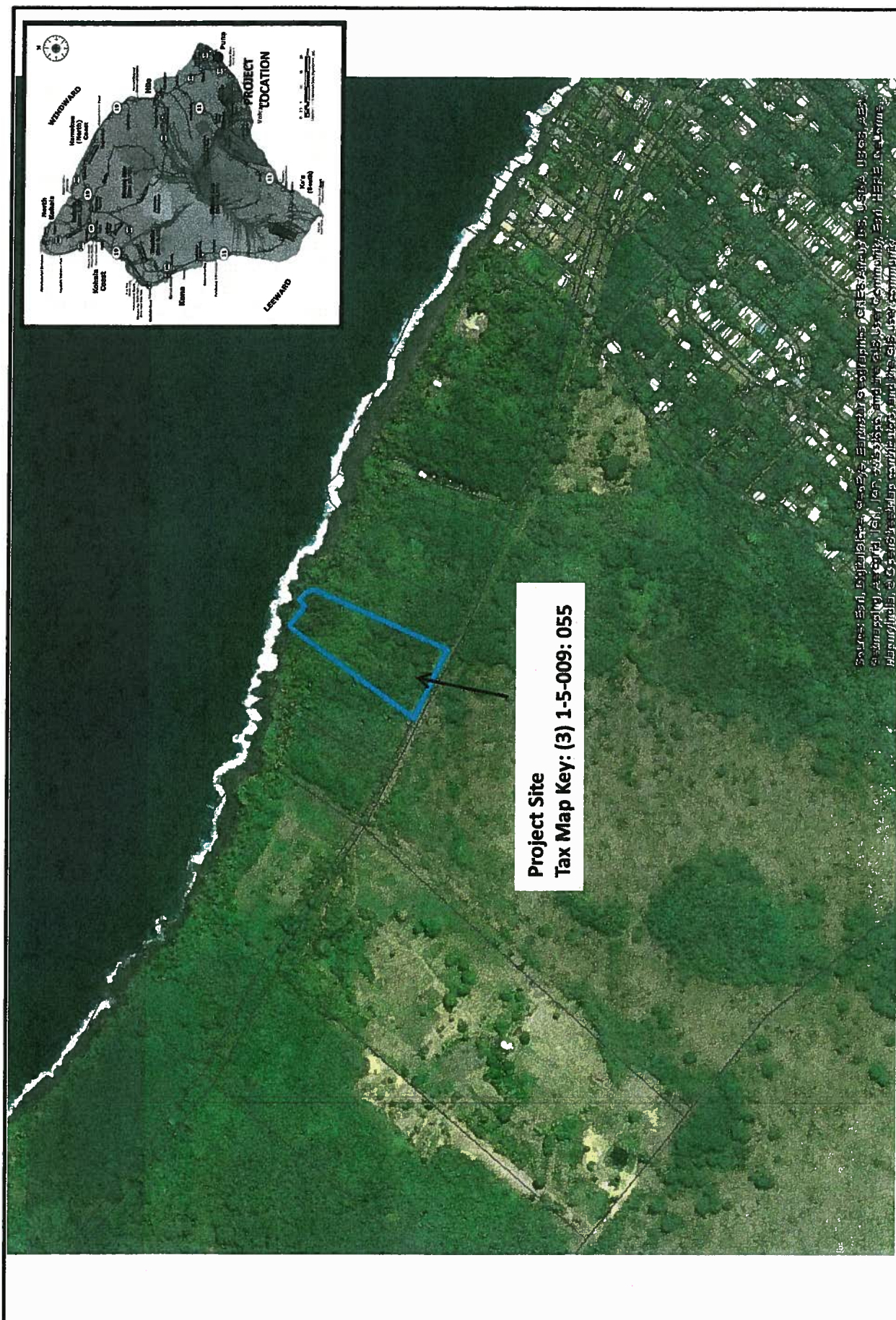


SUZANNE D. CASE., Chairperson
Board of Land and Natural Resources

- LEGEND**
- Conservation District Subzone:
-  Resource Subzone
 -  Project Area Boundary



CONSERVATION DISTRICT SUBZONE MAP





View from Old Government Beach Road (view to the northwest)



View of entrance to the property (view to the northeast)

SITE PHOTOS



Landscaping along driveway area (view to the northeast)



Easter boundary of the property (view to the southeast)

SITE PHOTOS



Mauka portion of the property (view to the east)



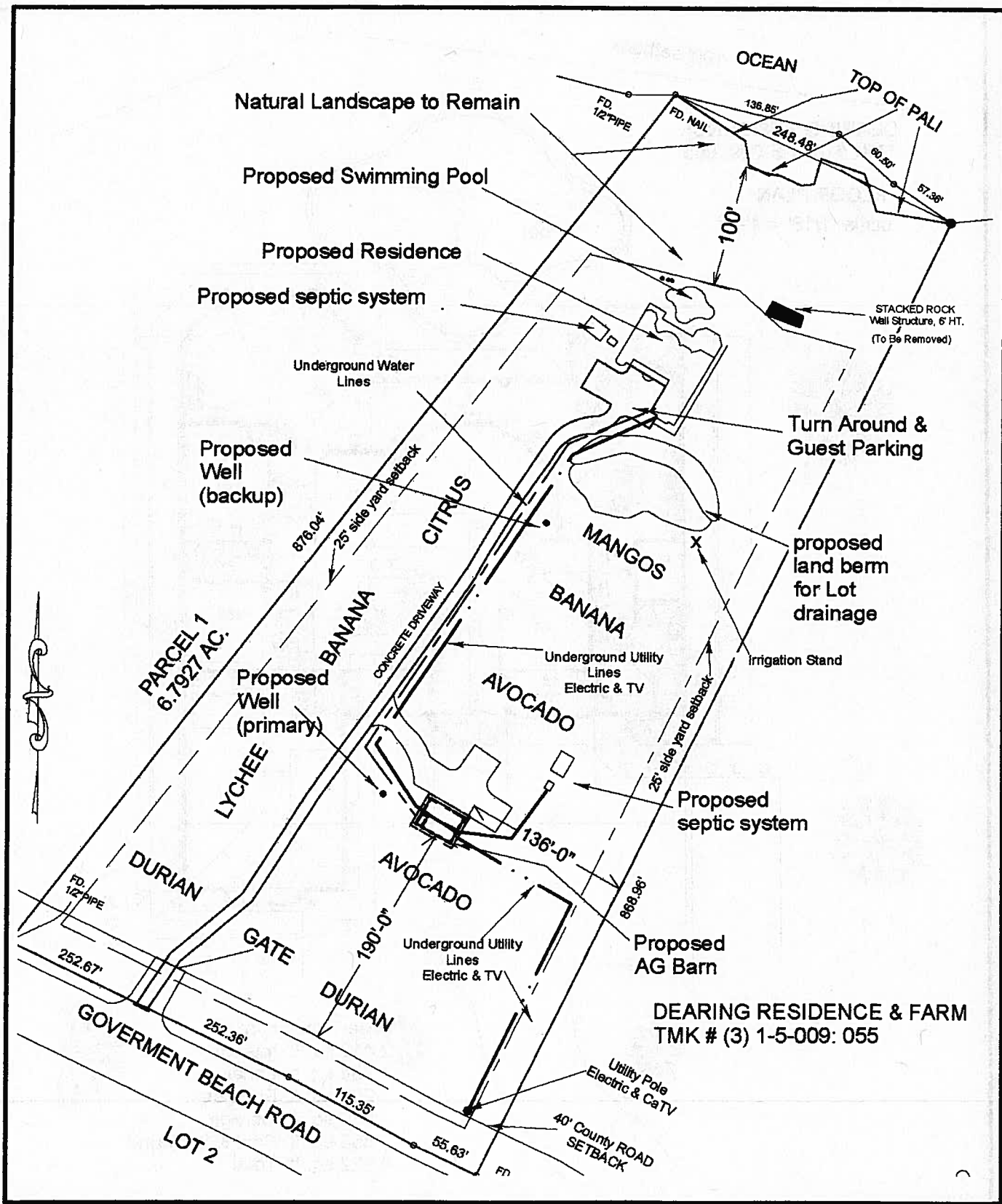
Coastal vegetation in the northeaster corner of the property (view to the southeast)

SITE PHOTOS



Coastal bluff fronting the property (view to the east)

SITE PHOTOS

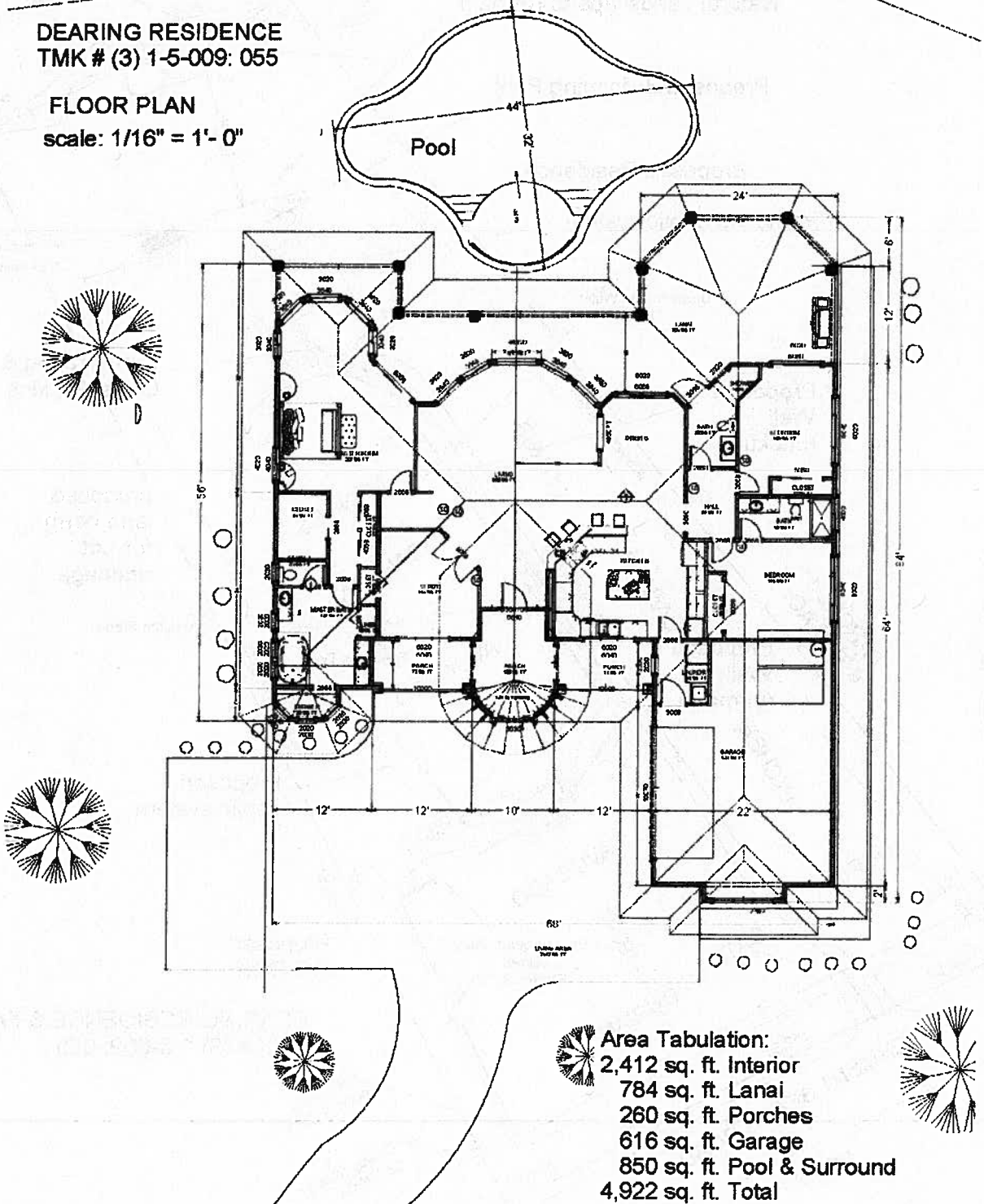


OVERALL SITE PLAN

100' setback

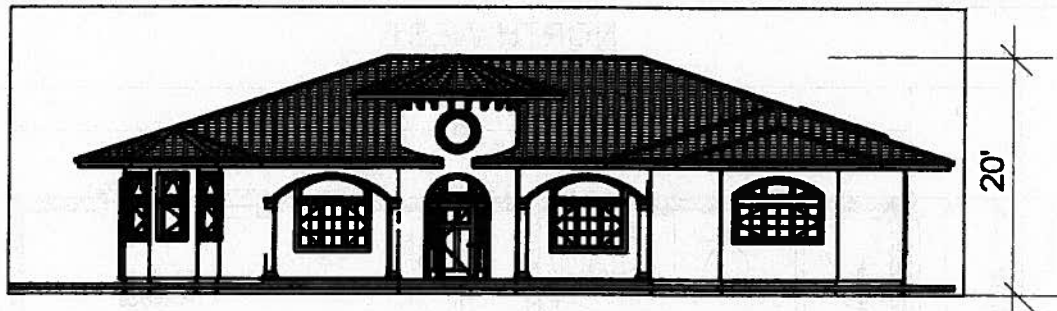
DEARING RESIDENCE
TMK # (3) 1-5-009: 055

FLOOR PLAN
scale: 1/16" = 1'- 0"

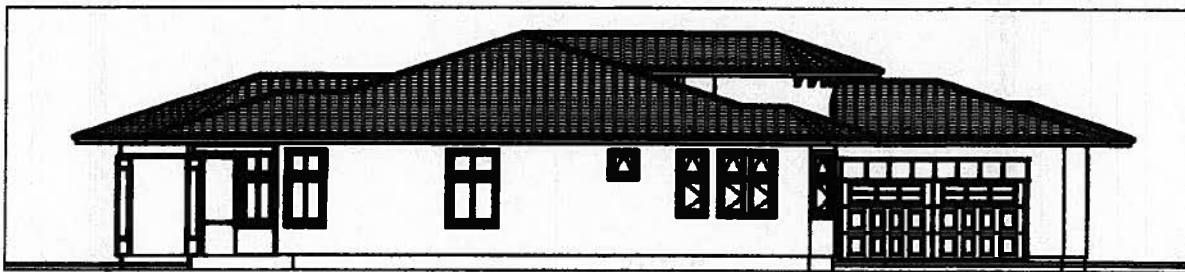


Area Tabulation:
2,412 sq. ft. Interior
784 sq. ft. Lanai
260 sq. ft. Porches
616 sq. ft. Garage
850 sq. ft. Pool & Surround
4,922 sq. ft. Total

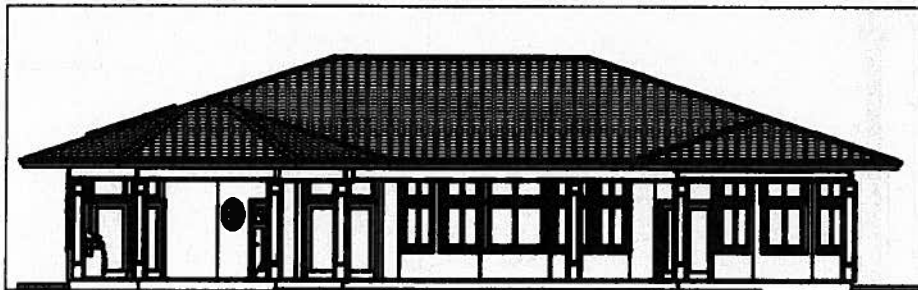
SINGLE FAMILY RESIDENCE SITE PLAN



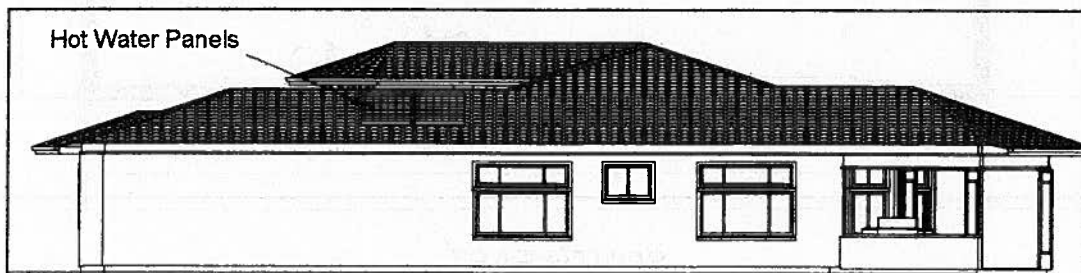
SOUTH WEST ELEVATION



NORTH WEST ELEVATION

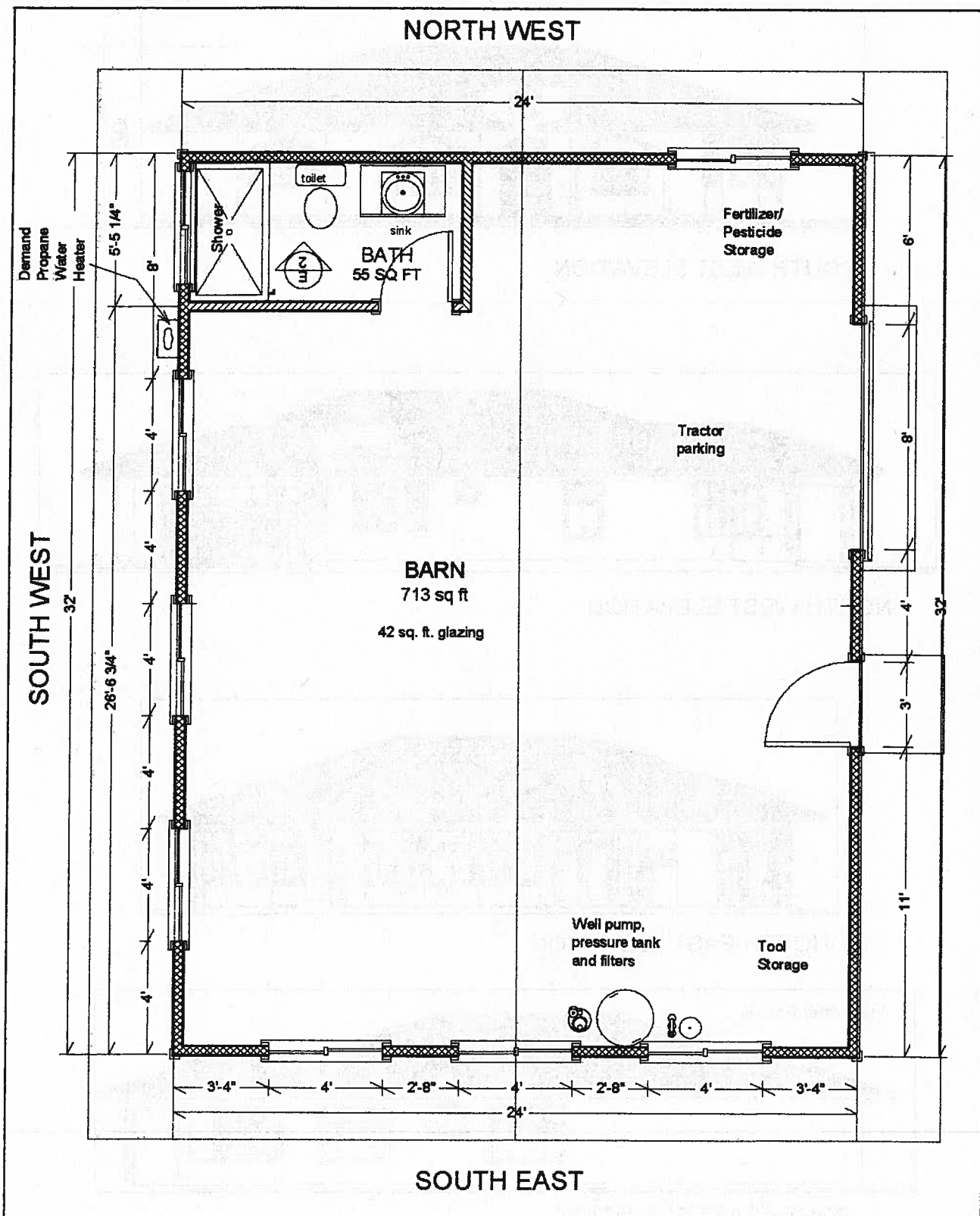


NORTH EAST ELEVATION

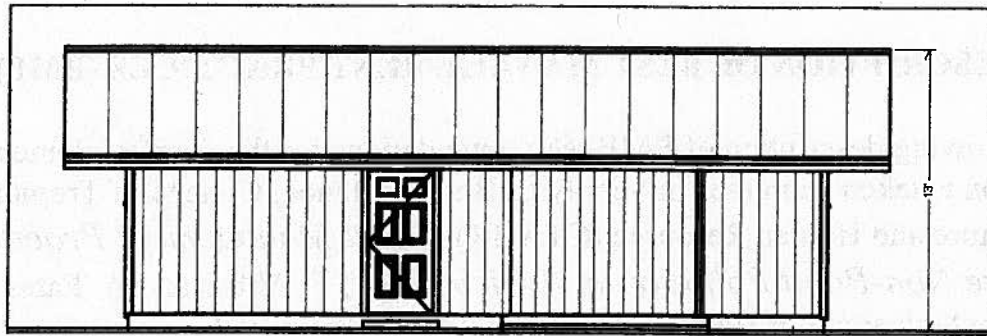


SOUTH EAST ELEVATION

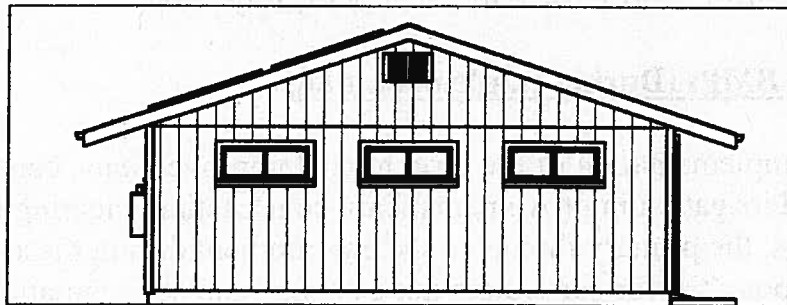
SINGLE FAMILY RESIDENCE ELEVATION DRAWINGS



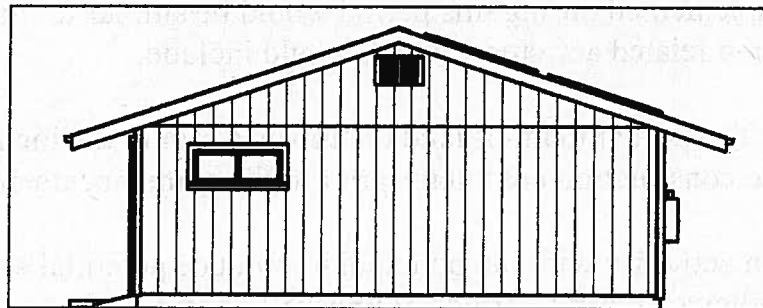
BARN FLOOR PLAN



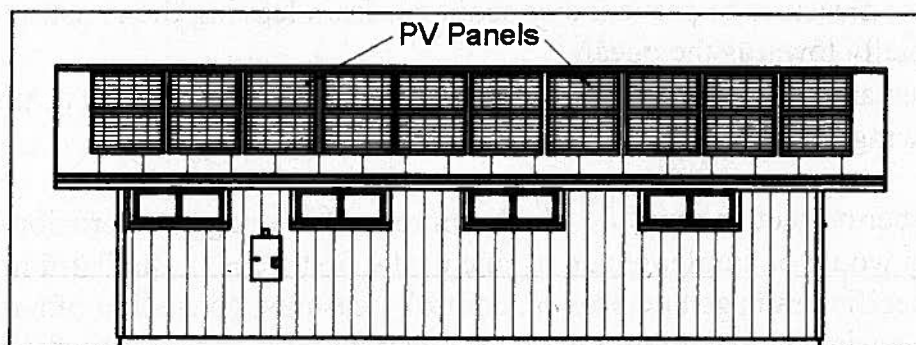
NORTH EAST ELEVATION



SOUTH EAST ELEVATION



NORTH WEST ELEVATION



SOUTH WEST ELEVATION

BARN ELEVATION DRAWINGS

IV. DESCRIPTION OF BEST MANAGEMENT PRACTICES (BMP)

The following description of BMP recommendations for the farm implementation and operation is taken from the University of Hawaii-Manoa, College of Tropical Agriculture and Human Resource (CTAHR), *"Best Management Practices to Manage Non-Point Pollution in Agriculture"*, F. Abbas and A. Fares, June 2009, and from University of Hawaii-Manoa, College of Tropical Agriculture and Human Resource (CTAHR), *"Integrated Pest Management for the Home Gardens: Insect Identification and Control"*, R. Ebesu, July 2003.

A. Short-term BMPs (During Implementation)

During the implementation of the farm related improvements, consisting of the drainage and irrigation improvements, barn construction, clearing of vegetation, and tree plantings, the primary threats to the environment during these activities would be from the potential for particulate dust, erosion and sedimentation as a result of the planned grading activities, which would be concentrated in the areas of the drainage basin/irrigation pond, well sites (2) and barn site. Consequently, the BMPs to be implemented during this period would be similar to those followed for most construction related activities, which would include:

- Minimizing the total amount of land disturbance required which will be delineated to construction contractor prior to the commencement of any onsite work.
- Construction activities with the potential to produce potential stormwater run-off will not be allowed during periods of unusually heavy rains or storm conditions.
- Prior to the start of construction, contractors will implement erosion and dust control measures to prevent any sediment from leaving the construction areas, especially towards the ocean.
- Graded areas will be replanted or otherwise stabilized, as soon as possible following grading activity.

As a further protective measure, the Farm related drainage and erosion control measures would be implemented as one of the first steps in the Farm implementation. These specific drainage and erosion control measures, consisting of a retention berm, drainage basin and irrigation pond and selection of areas for cultivation, have been planned in accordance with a Drainage and Erosion Control Study prepared for the Project and are shown in **Farm Drainage Plan (Figure 5)**. These improvements are planned in relation to the existing topography, such that the Drainage Basin and

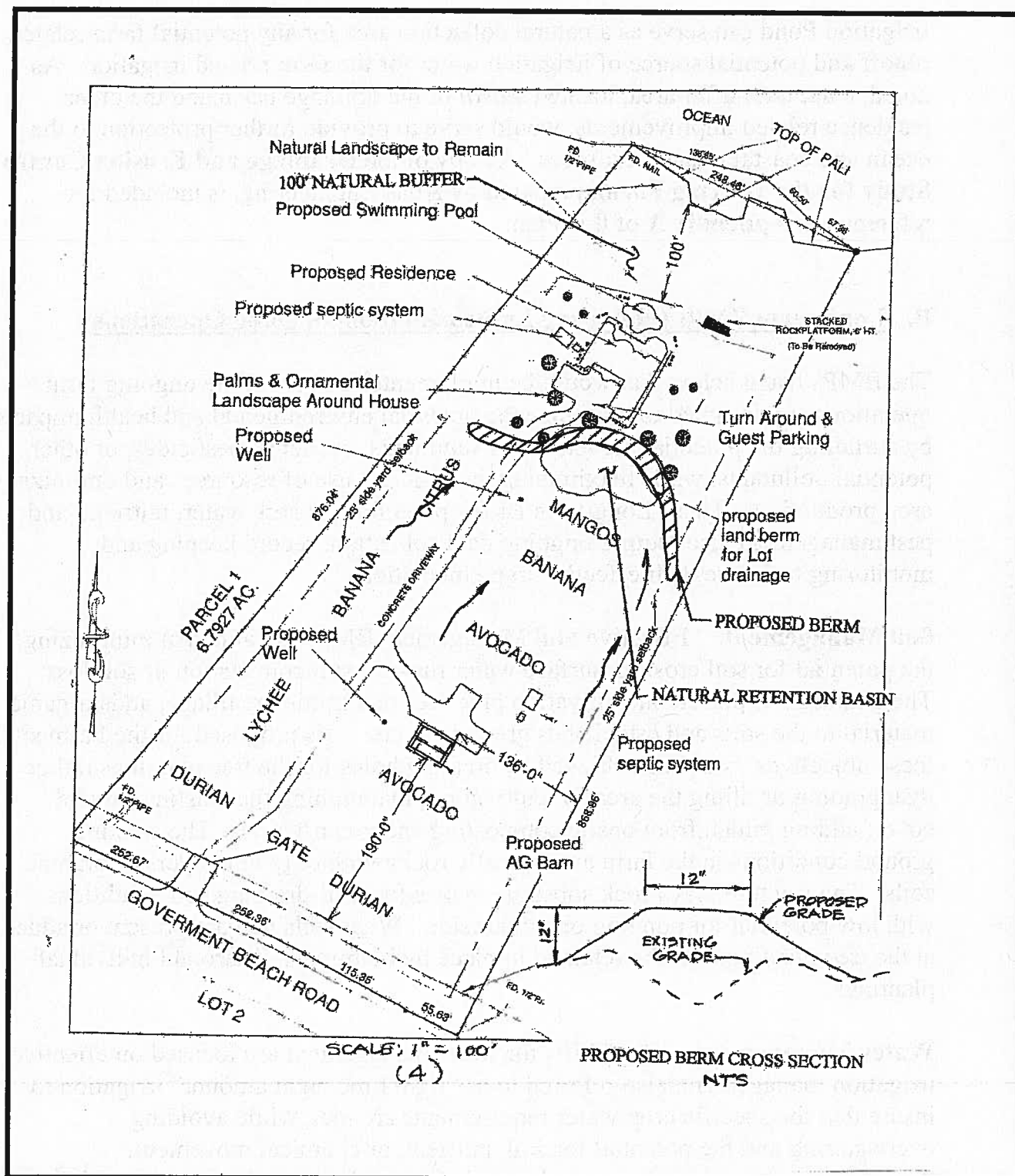


Figure 5.

Dearing Farm – Drainage Plan

Source: Erosion and Sedimentation Control Study, Dearing Residence and Farm, Paul A. Nash, PE

Irrigation Pond can serve as a natural collection area for any potential farm related runoff and potential source of irrigation water for the farm related irrigation. As noted, a natural buffer area, located *makai* of the drainage basin and the other residence related improvements, would serve to provide further protection to the ocean and coastal related resources. A copy of the **Drainage and Erosion Control Study for the Dearing Farm**, prepared by Atlas Engineering, is included for reference as **Appendix A** of this Plan.

B. Long-term BMPs (Following Implementation/Ongoing Operations)

The BMPs listed below that would be implemented as part of the ongoing farm operations are designed to minimize the potential environmental and health impacts by curtailing the potential movement of sediments, nutrients, pesticides, or other potential pollutants, while maximizing the efficient use of resources and optimizing crop production. These Long-term BMPs pertaining to soil, water, nutrient, and pest management also require ongoing data collection, record keeping and monitoring to insure their effective implementation.

Soil Management. Effective Soil Management BMPs are aimed at minimizing the potential for soil erosion, surface water run-off, soil compaction or soil loss. The emphasis is placed on cultivation practices that minimize tillage, adds organic material to the soils and establishes ground covers. As proposed for the Farm site, these objectives would be achieved by creating holes for the tree plantings rather than grading or tilling the area for cultivation; maintaining the existing ground cover; adding mulch from onsite composting and green-waste. The existing ground conditions in the farm are typically rocky with only thin layers of organic soils. The fractured lava rock substrate makes for well-draining soil conditions with low potential for ponding or soil erosion. What soils that are present or added at the tree plantings will be retained in place by berming soils around individual plantings.

Water Management. The BMPs for water management are focused on effective irrigation management, also referred to as “right time-right amount” irrigation to insure that the specific crop water requirements are met, while avoiding overwatering and the potential for soil, nutrient, or chemical movement. Pressurized irrigation systems, such as drip or sprinkler system, as proposed for the Farm site, have substantially higher irrigation efficiencies to traditional surface irrigation methods. Irrigation needs are minimized through the ongoing monitoring of each crop and their associated soil conditions. Irrigation scheduling should also

be optimized based on regular review of the soil conditions and water content, rainfall data, and crop parameters.

Nutrient Management. BMPs for nutrient management seek to monitor and regulate the application of nutrients to the soil according to the specific crop nutrient requirements. Nutrient management also includes selecting and using the appropriate organic manure amendments, which can help build and stabilize soils while reducing the need for chemical nutrients. Additionally, effective nutrient management involves the following practices:

- Understand the principles for nutrient management
- Understand the existing soil characteristics, fertility reserves, and nutrient requirements.
- Calibrate the application equipment in order to know and monitor the rate of nutrient application
- Implement BMPs for nutrient application (i.e, precautionary measures) to avoid the potential for nutrient leaching.
- Implement BMPs for soil and water conservation to minimize the potential for soil or nutrient movement.

Also, when using livestock manure as a nutrient source, the following should be considered:

- Local, state and federal laws and regulations must be followed during manure application.
- Take all precautionary measures to control against accidental leakage, spillage, or runoff from manure store and a site near a water body or source.
- Certain manures, such as chicken manure, can be volatile and contribute a noxious odor to the environment through ammonia emission and efforts should be taken to reduce emissions during manure storage and application.

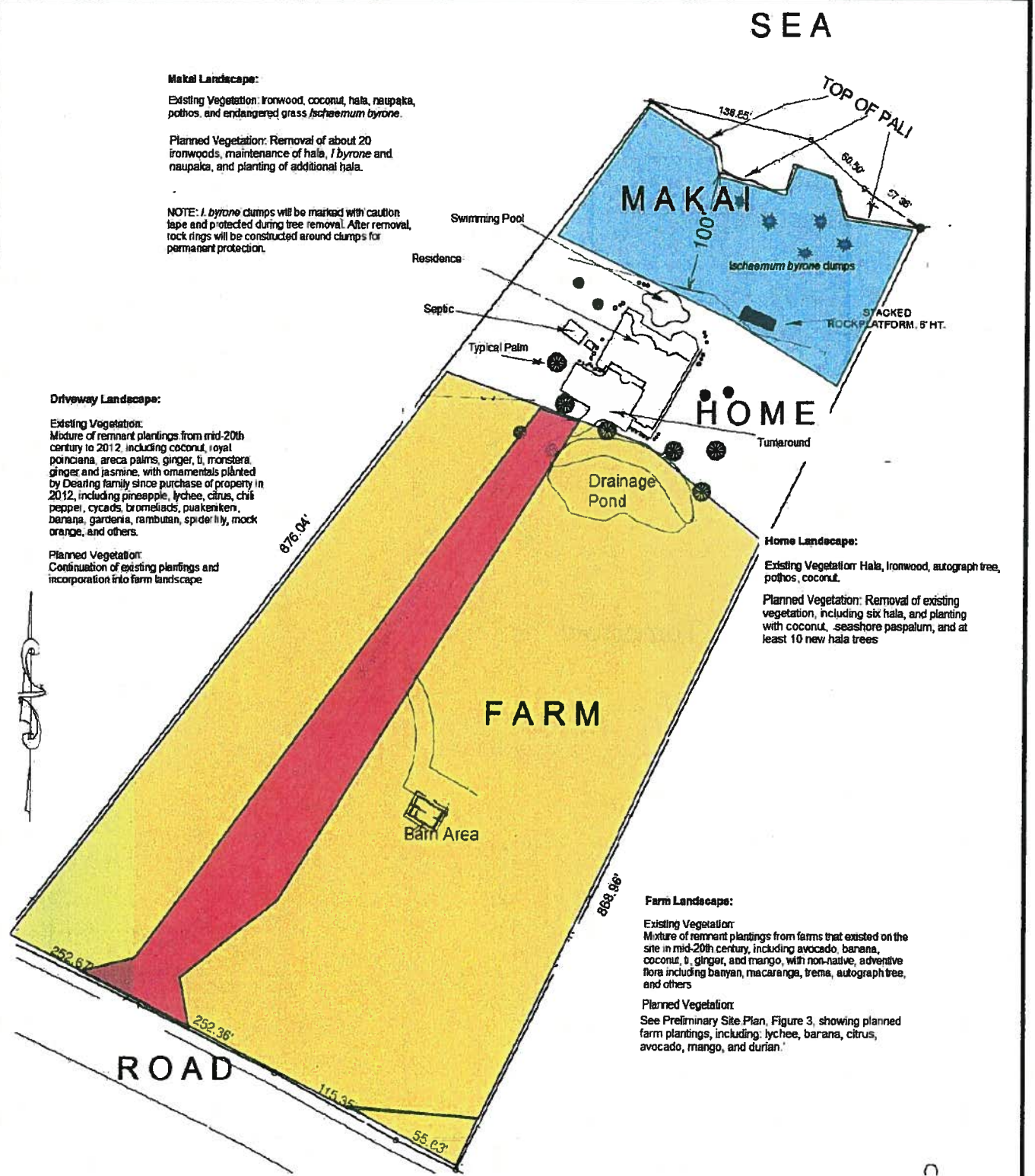
Pest Management (Pesticide Storage, Handling and Application). The safe and effective handling of pesticides is as important to personal health and safety as is to environmental protection. The BMPs related to the safe storage, handling and application of pesticides that should be integrated as part of the farm operations, include the following:

- Buy pesticides in small quantities.
- Store them in a secured area.

- Dispose of them in accordance with federal, state, and local regulations.
- Maintain application equipment in working condition and calibrate to ensure recommended rates are applied
- Ensure that the pesticide applicator know the exact location in the field to be treated.
- Avoid unnecessary application of pesticides.
- Avoid overspray and drift, especial when in close proximity to surface waters.
- Avoid pesticide application when soil moisture status is high, to prevent possible runoff or deep percolation.
- Avoid irrigation right after a pesticide application.
- Establish buffer zones to maintain a safe-distance from wells and surface water (50-100 feet recommended); and do not apply pesticides in buffer zones.
- Avoid repetitive use of the same pesticide, which may lead to pesticide resistance in the pest.
- Read and follow safety directions, and maintain appropriate Material Safety Data Sheets.
- Use appropriate protective equipment specified on the pesticide label to minimize unnecessary exposure.
- Formulate a safety plan to provide emergency hand and eye wash facilities for personnel who might be accidentally exposed to pesticides.
- Have a pesticide first-aid kit available when handling pesticides.

Integrated Pest Management (IMP). IMP is a holistic approach to pest management that can reduce the use of pesticides that may potentially impact the environment or the health and safety of those handling them. A successful IPM program involves the application of a mix of cultural, biological and chemical control methods, including pest monitoring, identification and control, the result of which provides a program for effective pest management with fewer pesticide applications. Essential elements of an effective IPM program include the following:

- Selection of pest-resistant crops.
- Maintaining strict sanitary conditions.
- Including biological control with mulching.
- Effective insect identification and control.*
- Removal, and eradication of affected plants.
- Effective control and timing of pesticide applications.



LANDSCAPING PLAN

Table 1. PLANT LIST

<u>Plant Name</u>	<u>Number of Plants</u>	<u>Area Planted</u>
Queen Emma Lily	7	Entry
White Spider Lily	10	Entry
Spathoglottis	6	Entry
Johnny Noble Ti	8	Entry
Apple Banana	10	Entry
Ferox Cycad	5	Entry
Pikaki	2	Entry
Bromeliad	5	Driveway
Dioon Cycad	3	Driveway
Mock Orange	5	Driveway
Puakinekine	2	Driveway
Rooster Tail Ti	5	Driveway
Yesterday, Today, Tomorrow	3	Driveway
Kula Gardenia	2	Driveway
Rambutan	1	Driveway
Stephanotis	1	Driveway
Tabernae	1	Driveway
Natalensis	3	Driveway
Hawaiian Pepper	3	Driveway
Croton	2	Driveway
Lychee	1	Tropical Fruit
Pineapple	7	Tropical Fruit
Citrus	7	Citrus

LIST OF PLANTINGS INVOLVED IN ENF OA 17-30