

**Final Environmental Assessment  
Amy Greenwell Ethnobotanical Garden Visitor  
Education Center and Parking Lot**

**TMK: (3<sup>rd</sup>) 8-2-13:02 and 05 (por.)**  
Captain Cook, South Kona District, Hawai'i Island, State of Hawai'i

May 2008

Prepared for:  
The Bishop Museum  
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and

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# **FINAL ENVIRONMENTAL ASSESSMENT**

## **AMY GREENWELL ETHNOBOTANICAL GARDEN VISITOR EDUCATION CENTER AND PARKING LOT**

TMK: (3rd) 8-2-13:02 & 05 (por.)  
Captain Cook, South Kona District, Island of Hawai'i, State of Hawai'i

### **APPLICANT:**

The Bishop Museum

### **APPROVING AGENCY:**

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### **CONSULTANT:**

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### **CLASS OF ACTION:**

Use of State Funds  
Use of County Lands

This document is prepared pursuant to:

The Hawai'i Environmental Protection Act,  
Chapter 343, Hawai'i Revised Statutes (HRS), and  
Title 11, Chapter 200, Hawai'i Department of Health Administrative Rules (HAR).

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## **SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

The Bishop Museum will develop a visitor education center and parking lot at the Amy Greenwell Ethnobotanical Garden (the Garden) in Captain Cook with assistance from a \$1.0 million appropriation from the State of Hawai‘i.

The visitor education center is being developed on a 1.718-acre property recently acquired by the Museum for this purpose. The remainder of the Garden is located on approximately 13 acres adjacent to the project site, donated to the Bishop Museum by the late Amy Greenwell in 1974 for an ethnobotanical garden.

Phase 1 of the project includes development of a single-story building of approximately 1,600 square feet that will include exhibit space, offices, and restrooms; landscape improvements; and an approximately 15-space parking lot with accessible stalls. The Museum is seeking funding for a second phase to include program space and a possible expansion of the parking lot to approximately 50 spaces. The Garden, which is open to the public on weekdays, supports Hawaiian cultural traditions of plant use by on-site and outreach educational programs, school visits and activities, workshops, plant sales, and conservation.

The project would have a negligible effect on traffic in the area, as it would basically relocate an access and produces only a small number of peak-hour trips that are off-phase from the principal congested periods in the areas. Short-term noise, air, and water quality impacts associated with grading and landscaping would be mitigated. The contractor shall perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code. The contractor will be required to consult with the Department of Health, and, if appropriate, obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction, which may include various mitigation measures. Absorption bed shallow drywells ~~A detention pond~~ will be designed and built to handle ~~retain the increase in~~ runoff relative to pre-development conditions from a minimum 25-year ~~50-year~~ storm event.

Archaeological and cultural surveys have determined that the site was previously graded and that no significant historic sites are present within the project site, or will be adversely affected by the project. Work involving potential land disturbance will be strictly limited to the project site through contractor orientation and orange fencing to mark sensitive areas. If archaeological resources, Hawaiian cultural items or human remains are encountered during land-altering activities associated with construction, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted. The Garden functions as an essential cultural resource by providing education in Hawaiian cultural traditions; the project will enhance the Gardens ability to provide these educational resources.

## **PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS**

### **1.1 Project Description and Location**

The 15-acre Amy Greenwell Ethnobotanical Garden (the Garden), a unit of the B.P. Bishop Museum (the Museum), is devoted to the study of Hawaiian people and their plants. The Garden, located in Captain Cook in South Kona (Figs. 1-4), displays more than 200 species of plants that grew in the traditional farms and native forests of Kona before Captain James Cook arrived in the late 18th century. These endemic, indigenous, and Polynesian-introduced plants include the most important plants in Hawaiian culture, such as taro and *kukui*, and scores of rare and endangered native species, including the native hibiscus, *koki'o*.

The Garden landscape reflects four biogeographical zones of a typical Kona *ahupua'a*, or traditional land division: coastal, dry forest, agricultural, and upland forest. The plants on the upper five acres of the Garden grow within a preserved archaeological site that is a portion of the celebrated Kona Field System, a 50 square mile network of farms and gardens that dominated the landscape in the time before foreign contact. Visits to the garden typically consist of half-hour, self-guided tours. Panels around a short looping trail at the center of the garden provide guidance, and plants throughout the garden have labels that explore their traditional uses. The Garden also provides on-site and outreach educational programs, school visits and activities, workshops, plant sales, and endangered species research and conservation. The Garden's 3rd Annual Grow Hawaiian Festival was held on February 24, 2007, attracting several hundred visitors to lectures, exhibits and hands-on activities conducted by scientists and cultural practitioners.

The Garden plans to build a visitor education center and 15-stall parking lot on a 1.718-acre property directly to the south that was recently acquired by the Museum for this purpose. The property is currently landscaped and is partly vacant and partly in use as a staging area for the unrelated Hawai'i County road construction project. The project would be funded with assistance from a \$1.0 million appropriation from the State of Hawai'i and Phase 1 includes development of a single story building of approximately 1,600 square feet that will include exhibit space, offices, and restrooms, landscape improvements, and an approximately 15-space parking lot. Figure 3 depicts the general location of the proposed improvements in relation to the existing Garden, Figure 5 is a Site Plan showing the layout of the parking, Visitor Center and drainage facilities, and Figure 6 illustrate a typical elevation of the Visitor Center building. The Museum is seeking additional funding for a second phase to include program space and additional parking.

The visitor center will be accessed by obtaining an easement over and improving a corner of Arthur Greenwell Park (TMK 8-2-13:05) as well as a short segment of a two-lane County driveway that currently provides access from Mamalahoa Highway to the park (see Figures 3 and 5). Visitors would no longer use the current driveway, which is an unpaved road on the north edge of the Garden.

## **1.2 Purpose and Need**

The Amy Greenwell Ethnobotanical Garden is a unique cultural and educational resource. The Garden stands alone in Hawai'i County as an essential educational resource linking culture and the Hawaiian natural environment with a vast array of native plants and plants that have been socio-economically important from pre-contact times to the present. The project will allow enhancement of the garden for cultural education with the addition of indoor program and parking space, and will also enhance the accessibility of adjacent public recreational facilities.

## **1.3 Environmental Assessment Process**

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawai'i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai'i Administrative Rules (HAR), is the basis for the environmental impact process in the State of Hawai'i. Compliance with these laws and regulations is required because of the use of State funds, and secondarily, the use of a corner of Arthur Greenwell Park, a County of Hawai'i facility. As the source of funding is a State of Hawai'i appropriation, the administering agency, the Hawai'i Department of Accounting and General Services (DAGS), is the approving agency for the EA. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur; Part 5 lists each criterion and presents the anticipated preliminary findings for each made by the propping entity. If, after considering comments to the Draft EA, the approving agency concludes that, as anticipated, no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to occur. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) will be prepared.

## **1.4 Public Involvement and Agency Coordination**

The following agencies and organizations were consulted in development of the environmental assessment.

### State:

Department of Land and Natural Resources, Historic Preservation Division  
Department of Land and Natural Resources, Director  
Office of Hawaiian Affairs  
Department of Transportation, Highways Division  
Department of Health, Environmental Health Administration

### County:

Planning Department  
Department of Public Works  
Police Department  
County Council  
Department of Water Supply

Fire Department  
Department of Parks and Recreation

Private:

Kona-Kohala Chamber of Commerce  
Kona Hawaiian Civic Club  
Sierra Club  
Kona Outdoor Circle  
Hawai'i Association of Seventh-Day Adventists  
Kealakekua Ranch Ltd.  
Manago Hotel Inc.  
Other neighboring property owners

Copies of comments received in response to early consultation are contained in Appendix 3. Appendix 4 contains written comments on the Draft EA and the responses to these comments. Various places in the EA have been modified to reflect input received in the comment letters; additional or modified non-procedural text is denoted by double underlines, as in this paragraph.

### **1.5 Property Ownership**

TMK 8-2-13:02 is property of the Bishop Museum.

## **PART 2: ALTERNATIVES**

### **2.1 No Action**

Under the No Action Alternative, the visitor education center and associated improvements would not be built and the parcel would remain in its present state. The area would not benefit from the improved cultural education opportunities and the consequent improvement in quality of life.

### **2.2 Alternative Locations or Strategies**

As other nearby properties are occupied or lack adequate access to Mamalahoa Highway, the subject site is only one that could reasonably fulfill the purpose and need for the project. The site lacks natural or cultural resources or major environmental constraints and is conveniently located on Mamalahoa Highway adjacent to the Garden. As there do not appear to be any environmental or other disadvantages associated with the proposed site, the property is well suited to the proposed use, and no reasonable alternatives appear to exist, no alternative sites have been advanced in the Environmental Assessment.

## **PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES**

### *Basic Geographic Setting*

The parcels upon which the park would be developed are referred to throughout this EA as the *project site*. The term *project area* is used to describe the general environs of the project site, and, in some cases, the entire South Kona District. The project site is located at approximately 1,450 feet in elevation in the community of Captain Cook, adjacent to Mamalahoa Highway at about the 110 mile marker (Appendix 1, Figures 1-2). The average maximum daily temperature is approximately 78 degrees F, with an average minimum of 65 degrees, and annual rainfall averages approximately 60 inches (U.H. Hilo-Geography 1998:57). The project site is grassy and bordered by large trees and a hedgerow of native plants serving as exhibits. Adjacent land is residential, recreational and commercial.

### **3.1 Physical Environment**

#### **3.1.1 Geology, Soils and Geologic Hazards**

##### *Environmental Setting*

The project area is located on the lower flank of Mauna Loa in an area sloping steeply to the east-northeast at approximately 14 percent. The surface consists of weathered basalt soils derived from Holocene epoch (between 10,000 and 5,000 years old) lava flows from Mauna Loa (Wolfe and Morris 1996). The project site soil is classified by the National Resource Conservation Service (formerly Soil Conservation Service) as Honuauulu extremely stony silty clay loam, a silty organic soil that forms in ash and has 25 to 50 percent of its surface occupied by rock outcroppings. Permeability for this soil is rapid, runoff is slow, and erosion hazard slight. The Capability Subclass is VIIs, and it is mainly used for pasturing, woodland, and wildlife areas (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the United States Geological Survey in this area of South Kona is 3 on a scale of ascending risk 9 to 1 (Heliker 1990:23). The high hazard risk is based on the fact that Mauna Loa is presently an active volcano. Volcanic hazard zone 3 areas have had 1-5% of their land area covered by lava or ash flows since the year 1800, but are at lower risk than zone 2 areas because of their greater distances from recently active vents and/or because the local topography makes it less likely that flows will cover these areas.

In terms of seismic risk, the entire Island of Hawai'i is rated Zone 4 Seismic Probability Rating (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built. The project site does not appear to be subject to subsidence, landslides or other forms of mass wasting. On Sunday October 15, 2006, two damaging earthquakes struck the west side of Hawai'i Island of Richter magnitude 6.7 and 6.0. These earthquakes caused no damage to the project site.

##### *Impacts and Mitigation Measures*

In general, geologic conditions impose no constraints on the proposed action, and the proposed project is not imprudent to construct.

### 3.1.2 Drainage, Water Features and Water Quality

#### *Existing Environment,*

The project area has no perennial surface water bodies. The Flood Insurance Rate Maps (FIRM) 1156C (9/16/1988) show that the project site itself is in Flood Zone X, outside of the 500 year flood plain. An often-overtopped flood control channel runs adjacent to the site, and downstream flooding caused by frequent heavy runoff on upstream properties has caused considerable local concern about any projects that could add runoff to the area and the channel (see October 24, 2006 letter of Thomas Langenstein, Appendix 3). A drainage report prepared for the project by Sam O. Hirota, Inc., Engineers and Surveyors, determined that pre-development, the project generates about 1.13 cubic feet per second (cfs) of runoff in the 50-year, 1-hour storm event, all of which currently flows towards Mamalahoa Highway and the drainage ditch. [Note to reader: the Draft EA inadvertently reported data on post-development runoff, not pre-development, in this paragraph.]

Kealakekua Bay is celebrated for its excellent marine biota, including healthy coral-based ecosystems. Special protection to aquatic resources is provided in the Kealakekua Bay Marine Life Conservation District (MLCD), in which marine organisms and their habitat are protected, while still allowing the public the opportunity to view them in their natural setting. The project site is located over a mile from Kealakekua Bay, at 1,450 feet in elevation. Runoff from the project site percolates into the ground on site or joins other drainage water from the project area (particularly Mamalahoa Highway) and travels in a drainage ditch across Mamalahoa Highway and Napoopoo Road before spreading out on property situated hundreds of feet in elevation above Kealakekua Bay and percolating through aerated rock.

#### *Impacts and Mitigation Measures*

The Hawai'i County Code Chapter 27, Flood Control, currently requires increases in storm water runoff for events up to and including the 10-year flood to be contained on site. The Hawai'i County Council has been considering requiring containment up to the 25-year storm; the goal of this project has been to meet or exceed containment for the 25-year storm. Typical measures for such containment include drywells and detention ponds that contain waters from the design-storm. Increases in flows greater than the design storm – which are generally assumed to be equivalent to predevelopment runoff because even with no development the ground becomes saturated quickly during such large events – are allowed to flow off site.

Post-development runoff for the one-hour, 50-year storm is calculated at 2.55 cfs, an increase of almost double. Original plans for the Visitor Center as reported in the Draft EA called for this additional runoff from the developed facility to be directed towards a detention basin. The detention basin would have held 250 cubic feet and would have had a drain inlet connecting to the existing drainage ditch for a controlled delivery of water. This would have retained the increase in runoff relative to pre-development conditions from a 50-year storm, an event that is significantly larger than the minimum 10-year event required to be in conformance with policies implementing Chapter 27, Flood Control, Hawai'i County Code.

In response to concerns from neighbors expressed in letters to the Draft EA about any release of water into the drainage ditch, the detention pond has been removed and a drywell is now planned, as shown in Figures 5a-b of Appendix 1. The new plan uses a shallow drywell to catch runoff from the improved site. The anticipated percolation rate of the drywell is 2 cubic feet per second (cfs). With the drywell in place, the net runoff from the site after the visitor center is built will be less than the runoff from the site as it is

now with no construction on it, even in a storm that exceeds in severity a 50-year storm event (.99 cfs runoff from the improved site in a 50-year event versus 1.13 cfs runoff from the site without improvements). This is greater than current legal requirements and is expected to meet or exceed future requirements. If and when Phase 2 is built, the drainage will be re-analyzed, and if the drywell does not meet or exceed then-current requirements, or, at a minimum, the 25-year storm, the drywell will be upsized or another drywell constructed to meet County requirements.

It should be noted that the Visitor Center and its parking lot will be one of the very few developed uses in the area that conform to these standards. As such, the Garden will be mitigating for its drainage impacts. Flooding problems in the area will continue because of upstream and adjacent uses that were developed prior to such standards or are exempt from meeting these standards and thus do not contain post-development minus pre-development runoff for even the 10-year storm on their properties.

In order to minimize the potential for construction phase sedimentation and erosion, the contractor shall perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai'i County Code. No impacts to stream banks or stream waters will occur as none are present. The SWPPP shall describe the emplacement of a number of best management practices (BMPs) for the project. These BMPs may include, but would not be limited to, the following:

- Minimization of soil loss and erosion by revegetation and stabilization of slopes and disturbed areas of soil, possibly using hydromulch, geotextiles, or binding substances, as soon as possible after working;
- Minimization of sediment loss by emplacement of structural controls possibly including silt fences, gravel bags, sediment ponds, check dams, and other barriers in order to retard and prevent the loss of sediment from the site;
- Minimizing disturbance of soil during periods of heavy rain;
- Phasing of the project in order to disturb a minimum necessary area of soil at a particular time;
- Application of protective covers to soil and material stockpiles;
- Construction and use of a stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond;
- Washing of vehicles in the designated wash area before they egress the project site;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel;
- Coordination of storm water BMPs and wind erosion BMPs whenever possible; and
- Cleanup and disposal at an approved site of significant leaks or spills, if they occur.

### **3.1.3 Flora, Fauna and Ecosystems**

#### *Existing Environment*

The natural vegetation of this part of South Kona was most likely mesic rain forest dominated by 'ohi'a (*Metrosideros polymorpha*) and koa (*Acacia koa*) (Gagne and Cuddihy 1990). These original communities, however, have been altered by traditional Hawaiian cultivation and later cattle grazing, agriculture and urban uses. The vegetation of the project area is now mainly managed vegetation in the form of commercial and residential landscaping, farms, and the Garden itself, interspersed with patches of weeds. A botanical reconnaissance of the graded and landscaped project site was performed in December 2006 by Ron Terry of Geometrician Associates and Peter Van Dyke of the Garden. The species list (Table 1) includes a number of cultivated and ornamental species.

**Table 1**  
**Plant Species on Proposed Visitor Center Project Site**

Scientific Name	Family	Common Name	Life Form	Status
<i>Araucaria heterophylla</i>	Araucariaceae	Norfolk Island pine	Tree	A
<i>Bidens alba</i>	Asteraceae	Bidens	Herb	A
<i>Carica papaya</i>	Caricaceae	Papaya	Tree	A
<i>Citrus sp.</i>	Rutaceae	Jabon	Tree	A
<i>Chenopodium oahuense*</i>	Chenopodiaceae	Aheahea	Shrub	E
<i>Cleome gynandra</i>	Capparaceae	Spider wisp	Herb	A
<i>Cordia subcordata*</i>	Boraginaceae	Kou	Tree	A
<i>Cordyline fruticosa</i>	Agavaceae	Ki	Shrub	A
<i>Desmodium triflorum</i>	Fabaceae	Beggarweed	Herb	A
<i>Dimocarpus longana</i>	Sapindaceae	Longan	Tree	A
<i>Dodonea viscosa*</i>	Sapindaceae	'A'ali'i	Shrub	I
<i>Eleusine indica</i>	Poaceae	Wire grass	Herb	A
<i>Epipremnum aureum</i>	Areaceae	Pothos vine	Vine	A
<i>Euphorbia heterophylla</i>	Euphorbiaceae	Kaliko	Herb	A
<i>Ficus microcarpa</i>	Moraceae	Chinese banyan	Tree	A
<i>Hyptis pectinata</i>	Lamiaceae	Comb hyptis	Shrub	A
<i>Ipomoea indica</i>	Convolvulaceae	Koali 'awa	Vine	I
<i>Leucaena leucocephala</i>	Fabaceae	Haole koa	Tree	A
<i>Mimosa pudica</i>	Fabaceae	Sensitive plant	Herb	A
<i>Morinda citrifolia*</i>	Rubiaceae	Noni	Shrub	A
<i>Momordica charantia</i>	Cucurbitaceae	Momordica	Vine	A
<i>Nototrichium sandwicensis*</i>	Amaranthaceae	Kulu'i	Shrub	E
<i>Panicum maximum</i>	Poaceae	Guinea grass	Herb	A
<i>Persea americana</i>	Lauraceae	Avocado	Tree	A
<i>Euphorbia pulcherrima</i>	Euphorbiaceae	Poinsettia	Shrub	A
<i>Psydrax odoratum*</i>	Rubiaceae	Alahe'e	Tree	I
<i>Ricinus communis</i>	Euphorbiaceae	Castor bean	Shrub	A
<i>Scaevola sericea*</i>	Goodeniaceae	Naupaka	Shrub	I
<i>Schefflera actinophylla</i>	Araliaceae	Octopus tree	Tree	A
<i>Senna guadichaudii</i>	Fabaceae	Kolomona	Tree	A
<i>Sida fallax*</i>	Malvaceae	'Ilima	Shrub	I
<i>Sida rhombifolia</i>	Malvaceae	Cuba Jute	Herb	A
<i>Spathodea campanulata</i>	Bignoniaceae	African tulip	Tree	A
<i>Sporobolus africanus</i>	Poaceae	Rattail grass	Herb	A
<i>Syngonium sp.</i>	Araceae	Syngonium	Vine	A
<i>Thespesia populnea*</i>	Malvaceae	Milo	Tree	I
<i>Waltheria indica</i>	Sterculiaceae	'Uhaloa	Herb	I
<i>Wikstroemia sp.*</i>	Thymeliaceae	'Akia	Shrub	E

Notes: Alien (A), Endemic (E), and Indigenous (I)

\* Native plants are garden elements planted in a border that will remain and be enhanced.

Native birds including Hawaiian Hawks (*Buteo solitarius*) and Hawaiian hoary bats (*Lasiurus cinereus semotus*), both listed endangered species, are often seen in this area as well as most non-arid locations on the Big Island.

As with many areas of the Big Island, Captain Cook has a coqui problem. These non-native Caribbean frogs (*Eleutherodactylus coqui*) are present in far greater concentrations than in their homelands because Hawai'i lacks predators for the frog. They cause both environmental problems and produce extremely loud, shrill call at night that disturbs people. An October 24, 2006 letter from Thomas Langenstein (see Appendix 3) identified the Garden as containing an infestation. Director Peter Van Dyke is aware of the problem and has since treated the infested area with hydrated lime. The Garden continues to monitor the coqui situation and will apply treatments as necessary.

#### *Impacts and Mitigation Measures*

Because of the lack of native ecosystems, or threatened or endangered plant species, no adverse impacts to botanical resources would occur as a result of clearing and improvements. No impact to native fauna, including Hawaiian Hawks or Hawaiian hoary bats, is expected. The project itself represents a substantial benefit to the conservation of native plants and ecosystems. A landscape plan will be implemented to enhance the scenic value of the area by integrating the newly landscaped areas into the garden, and also to mitigate any impact to the erosion control functions of the existing vegetation. No plants that are presently a part of the educational experience of the garden will be displaced.

### **3.1.4 Air Quality, Noise, and Scenic Resources**

#### *Environmental Setting*

Air pollution in West Hawai'i is minimal, and is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that occasionally blankets the district.

Noise on the project site is low and derived mainly from motor vehicles, with occasional noise from residential and road maintenance activities.

The project area does not contain any sites or view planes that are considered significant for their scenic character in the Hawai'i County General Plan.

#### *Impacts and Mitigation Measures*

The proposed action would not measurably affect air quality or noise levels except minimally during construction. Removal of existing vegetation would be required. Areas on the periphery of the parking lot and visitor education center would be integrated into the landscaping of the garden.

Development would entail limited excavation, grading, compressors, vehicle and equipment engine operation, and construction of new infrastructure. These activities may generate noise exceeding 95 decibels at times, impacting nearby sensitive noise receptors, including the Manago Hotel and Yano Hall. In cases where construction noise is expected to exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors would obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH would review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers.

The No Action Alternative would present no potential noise impacts to nearby sensitive receptors.

### **3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions**

#### *Environmental Setting, Impacts and Mitigation Measures*

The history of use of the site for traditional Hawaiian farming, grazing, and Garden activities does not suggest the potential for presence of hazardous materials. A construction project that has been staging on a portion of the project site appears to have practiced good housekeeping procedures and avoided any spills or releases, and reconnaissance of the site in October 2006 did not reveal any equipment, structures or conditions that might be indicative of hazardous material use. Therefore, based upon prior and present use of the project site, no hazardous substances, toxic wastes, or hazardous conditions are expected to be present on the site.

## **3.2 Socioeconomic and Cultural**

### **3.2.1 Socioeconomic Characteristics**

The project would affect and benefit the district of South Kona. Table 2 provides information on the socioeconomic characteristics of South Kona along with those of Hawai'i County as a whole for comparison, from the United States 2000 census.

#### *Impacts*

The proposed project would benefit public welfare in the South Kona District and Hawai'i County through enhancement of the value of an important cultural learning site, and through enhanced access to recreational opportunities.

While the No Action Alternative would not require the expenditure of public funds, it would obviate public benefit from the project.

**Table 2**  
**Selected Socioeconomic Characteristics**

CHARACTERISTIC	ISLAND OF HAWAI'I	SOUTH KONA
Total Population	148,677	8,589
Percent Caucasian	31.5	34.1
Percent Asian	26.7	24.1
Percent Hawaiian	9.7	12.1
Percent Two or More Races	28.4	18.3
Median Age (Years)	38.6	41.2
Percent Under 18 Years	26.1	25.5
Percent Over 65 Years	13.5	13.2
Percent Households with Children	21.3	26.7
Average Household Size	2.75	2.76
Percent Housing Vacant	15.5	11.4

Source: U.S. Bureau of the Census. May 2001. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai'i*. (U.S. Census Bureau Web Page).

### **3.2.2 Cultural Setting**

The cultural and archaeological setting of the subject area is described in *Gardens of Lono, Archaeological Investigations at the Amy B.H. Greenwell Ethnobotanical Garden* (Allen 2001). This section, which discusses the cultural history of the area, is based primarily upon information in this work and in an archaeological assessment of the site contained as Appendix 2.

Settlement patterns and the social evolution of this portion of Kona are mirrored by the network of archaeological sites known as the Kona Field System, a major agricultural complex that extended from the coast to wetter reaches on the higher slopes of Hualalai and Mauna Loa (discussed in more detail below in Section 3.2.3 and in Appendix 2). Initial settlement of the Kona coast occurred in the period 600-1000 A.D. (Schilt 1984), and consequent inland cultivation was underway by the 14<sup>th</sup> century A.D. Growth of the Kona field system in this period is tied to the region's ascent in political and religious importance.

The ahupua'a of Kealakekua is central to the history of Hawai'i as a center of settlement and royalty and the focal point of western contact. 'Umi a Liloa, who united Hawai'i Island, afterward moved the royal court from Waipi'o to Kona. Since this time Kona, and Kealakekua in particular, are prominent in the struggles for political dominance over the Island. In fact, the battle at Moku'ohai, located between Kealakekua and Honaunau, is recognized as a key point in Kamehameha's rise to power.

Kealakekua Bay is popularly recognized as an important point of western contact, with James Cook's visit and subsequent death at Ka'awaloa, at the north end of Kealakekua Bay. Accounts from this and later visits by explorers, whalers, and missionaries recall thriving communities with a highly developed system of agriculture. A member of Cook's crew estimated the population around Kealakekua Bay at 15,000 (Ledyard 1963). Cook's midshipman Gilbert recorded, "The Country here is one entire plantation; as far as we could see from the ship which is divided into squares by stones thrown together or hedges of sugar cane (Holmes 1982)."

The Amy Greenwell Ethnobotanical Garden is located within the *ahupua'a* of Kealakekua, which translates literally as "path of the god", a reference to Lono, god of fertility and dryland agriculture (Handy and Handy 1972). At the time of contact the largest villages in the *ahupua'a* were Ka'awaloa, at the north end of Kealakekua Bay, and Kekua, where Napo'opo'o is now found. Inland settlements were smaller and scattered, and population of the Kealakekua *ahupua'a* was approximately 11,000 (Beaglehole 1967) at the time of contact.

Fifteen years after Cook's visit, the botanist and surgeon on George Vancouver's expedition observed:

"Seeing these upper regions so industriously cultivated and teeming with productive crops...we are certain that nothing but wars, destructive wars, and commotions can ever reduce them to scarcity, seeing that they thus avail themselves of Nature's bounty in the conformation of their country by extending their cultivation to different regions of the air, they secure a continued succession of crops and therefore can never be destitute of supply" (Menzies 1920).

This account describes adaptation of cultivars to particular microclimates, which varied primarily with altitude. Lowest and driest was the *Kula*, the coastal lowland, more sparsely cultivated than upland region with *'ilima* (*Sida spp.*) and *maia pilo* (*Capparis sandwichiana*), used for medicinal and other uses. Located above the *Kula* was the *Kalu'ulu*, or breadfruit (*Artocarpus altilis*) cultivated region, with useable space in between these trees planted with other food plants. A gradual boundary led to the next highest region, termed the *'Apa'a* zone, intensively cultivated with *kalo* (*Colocasia esculenta*), *wauke* (paper mulberry, *Broussonetia papyrifera*), and *ko* (sugar cane). Planting areas were divided by *kuaiwi*, or low stone walls running with the slope, which may have also served as trails between cultivated areas. Some of the stone walls noted here followed the slope, and are called *kuaiwi*, eight of which are found in the Amy Greenwell Ethnobotanical Garden, which occupies a portion of the Kona field system. Above, the *'Apa'a* gave way to the *'Ama'u* zone, or fern forest zone, so-named for a common tree fern (*Sadleria cyatheoides*), and where *mai'a*, or bananas, were the dominant cultivar. Sweet potatoes, or *uhi*, were planted in a wide range of microclimates, from the *Kula* to the higher and wetter *'Apa'a* (Kelly 1983).

After contact, social change soon accelerated, driven by disease and drought, missionary activity, trade and urbanization. Trade with both the western world and Asia brought the beginnings of a money economy, and demand for sandalwood proved lucrative to the *ali'i*, distracting their attention from food production. While at first whaling and other forms of trading centered around Kealakekua, this activity soon declined as Kamehameha directed ships to the urban centers of Kailua, Lahaina, and Honolulu.

While accounts of early 19<sup>th</sup> century Kealahou are rare, it appears that significant changes in agriculture occurred due to trade and frequent importation of exotic species, with the addition of western technologies. At this time cultivation of cotton, coffee, citrus, pineapple, and tobacco were noted, which were often grown only for export and trade, and not as staples, and by 1818 distillation was being used to make liquor out of *ki* root and sugar cane (Golovnin 1979).

Introduced diseases rapidly took their toll on the native population, and by 1833 the population of the entire Kona district was estimated at 10,000-12,000 (KKS 1833), compared to the estimated 11,000 at Kealahou alone around the time of contact. The effects of disease were exacerbated by drought and fire during this period. Kealahou Bay was closed to ships for several years in 1846 due to epidemics. And the Great Mahele of 1848 effectively severed almost all connection the *maka'ainana*, or commoners, had maintained with their traditional croplands, leaving ownership of all of Kealahou in the hands of a select few individuals. By the years after shortly after 1850, accounts suggest that the Kona field system was largely unmaintained, depopulation of the area being extensive (Hill 1856, Anderson 1865).

While coffee cultivation started slowly, by the turn of the century it dominated agriculture in Kona, having displaced other crops including sugar cane, which was not as profitable in the dry climate. Coffee cultivation has affected settlement patterns by bringing an influx of *haoles* entrepreneurs, who typically subdivided properties into parcels of five acres, frequently subleasing to Japanese workers, who were required to sell their product to the leaseholders. Coffee was grown on the Garden, which is located in the best coffee country. Ranching also became common, outranking the production of most cash crops. In 1880 Henry Greenwell purchased Kealahou and Ka'awaloa, using much of the land for cattle pasture, although the 1946 tsunami damaged the harbor facilities at Kealahou Bay, and cattle ranching declined in the area thereafter.

The Garden property was willed to the Bishop Museum on Amy Greenwell's death in 1974, who asked that it be developed into a "garden in the pre-Cookian style." Development of the garden began in 1978 and opened in 1988. The Garden includes those that were cultivated in the Kona field system, planted in a manner reflective of the cultivation zones, from the *Kula*, *Kalu'ulu*, and *Apa'a*, to the upland 'Ama'u zone, as well as plantings of other native plants and economically important plants in modern times. Thus the garden reflects, preserves and enhances the cultural history of the Kealahou ahupua'a as part of its primary focus.

The Garden, which is open daily, supports Hawaiian cultural traditions of plant use by on-site and outreach educational programs, school visits and activities, workshops, plant sales, and conservation.

### *Impacts and Mitigation Measures*

The Amy Greenwell Ethnobotanical Garden provides cultural preservation and education with emphasis on the long history of complex agricultural technologies in pre-contact times and as such, is an important cultural resource. The proposed Visitor Center project has been designed to enhance the botanical and cultural missions of the Garden, and all cultural impacts appear to be highly beneficial. Cultural practitioners are an integral part of the Garden's programs and development, and among those kama'aina to Kona, Lehua Domingo, Shirley Kauhahao, Elizabeth Lee, Bill Panui,

Brenda Lee Machado, Nancietta Haalilio, Peter Park, Hannah Springer, Nolan Grace, and Carla Freitas are aware of the Visitor Center and its proposed location, and in some cases have actively participated as volunteers in its development. As part of the current EA, further efforts were taken to determine whether the project would adversely impact traditional cultural properties and associated practices that might be present, or have taken place in the project area, including contact with the Office of Hawaiian Affairs and the Hawaiian Civic Club of Kona, who did not identify any potential adverse impacts.

### 3.2.3 Archaeology and Historic Sites

#### *Existing Environment*

As discussed above, the project site centrally located within the defined boundaries of the what is known as the Kona Field System, a dryland agricultural complex covering approximately 60 square miles from the coastline to the forested slopes of Hualālai between Kailua and Ho‘okena (Newman 1970). A large portion of this area has already been designated in the Hawai‘i State Inventory of Historic Places (SIHP) as Site 50-10-37-6601 and has been determined eligible for inclusion in the National Register of Historic Places (NRHP). The Kona Field System is characterized by *kuaiwi*, walls that parallel the slope. Between the *kuaiwi*, other traditional Hawaiian planting features are present such as mounds, terraces, modified outcrops, and platforms. A large body of archaeological and ethnohistorical research has been developed on the features and functions of the Kona Field System, which is summarized below. Interested readers are referred to Appendix 2 for most scholarly references and detailed discussions.

As discussed above, Hawaiians traditionally distinguished between the major vegetation/cultivation zones, which are bands of vegetation, roughly parallel to the coast, corresponding to changes in elevation and rainfall. These terms were used to define and segregate space within the *ahupua‘a* and later, to delineate land claim boundaries during the *Māhele*.

The current study area falls within the *‘Apa‘a*. In addition to rock mound and terraces, *kuaiwi* are prominent archaeological features of the landscape within the *‘Apa‘a* (Cordy 1995; Newman 1970). These are typically long and broad piled stone walls that appear to have been multifunctional. The construction of *kuaiwi* was likely a by-product of land clearing as rocks were removed to create planting areas. The *kuaiwi* parallel the *mauka-makai* slope and are intersected by shorter, perpendicular retaining cross-walls.

Agricultural fields are thus discernible by the rectangular pattern created by the *kuaiwi* and cross-walls. The archaeological record contributes to our understanding of how the Kona Field System developed over time. A number of studies indicate that it was not brought to Kona as a fully developed system; but rather, it reflects developmental adaptation to the area likely associated with the evolving sociopolitical structure and increasing population in Kona. The first inhabitants of Hawai‘i Island probably arrived by at least A.D. 300 (Kirch 1985) and focused habitation and subsistence activity on the windward side of the island. To date, there is no archaeological evidence for occupation of the Kona region during this initial stage of colonization, and until about A.D. 1000 little activity was taking place in Kona. Habitation there concentrated along the shoreline and lowland slopes, and informal fields were probably situated in areas with higher rainfall.

Agricultural fields and habitation areas expanded across the slopes and coastal area of Hualālai during the Late Expansion Period (A.D. 1100 to 1400). The earliest fields may have been located in the southern portion of the system, with new fields expanding northward over time. It is likely that during the initial stages of the Intensification Period (A.D. 1400 to 1600) the construction of the extensive formal walled fields began, marking the emergence of the Kona Field System (Schilt 1984). The development of the fields may in part be a by-product of the need to extract more subsistence resources from an increasingly limited agricultural base. Radiocarbon data suggest that the population in Kona increased dramatically during this period. By the time the first European explorers began arriving in Hawai‘i, the Kona Field System had reached its greatest extent. Perhaps consequently, the native population had also reached its height. Early explorers marveled at the size and fertility of Kona’s upland plantations. Archibald Menzies, a surgeon and naturalist who accompanied Vancouver to Kealahou Bay in 1793, wrote:

“For several miles round us there was not a spot that would admit of it but what was with great labor and industry cleared of loose stones and planted with esculent [taro] roots or some useful vegetable or other. In clearing the ground, the stones are heaped up in ridges [*kuaiwi*] between the little fields and planted on each side, either with a row of sugar cane or the sweet root [ti] of these islands...where they afterwards continue to grow in a wild state, so that even these stony uncultivated banks are by this means made useful to proprietors, as well as ornamental to the fields they intersect” (Menzies 1920:75-76).

There has been a comprehensive study of upland archaeological features within the Kona Field System directly adjacent to the project site in *The Gardens of Lono: Archaeological Investigations at the Amy B. H. Greenwell Ethnobotanical Garden, Kealahou, Hawai‘i* (Allen 2001). Contributors to this volume meticulously recorded, tested, and described the quantifiable traits of many diverse agricultural features (including terraces, *kuaiwi*, and mounds) and recovered artifactual material. They also offer insights into the temporal development of the AGEG fields and apply their findings to the Kona Field System as a whole. One conclusion was that the fields at the Garden developed over time in five phases.

According to Allen, development of the fields at AGEG (Phase I) began between A.D. 1400-1600 using “slash and burn” technologies. Also at this time small activity areas were cleared and utilized by the farmers building the fields. Then, following almost immediately afterwards, in areas of at least semipermanent garden plots, cross-slope terraces were constructed (Phase II) to help prevent erosion and maintain soil. This was followed in the mid-1500s to 1600s by the construction of *kuaiwi* (Phase III), which functioned as field boundaries, clearing piles, and/or planting features. Subsequent to the stabilization of the slope and construction of *kuaiwi* came the use of stone mounds for gardening (Phase IV). These mounds could have functioned either as planting or clearing features and may represent a historic shift in agriculture stemming from an adaptation of Native Hawaiian technologies to newly introduced plant species.

Phase IV was followed by the introduction of coffee (Phase V) and a shift to a market economy in the late nineteenth century. These late nineteenth century economic shifts were precipitated by late eighteenth and early nineteenth century events. By the time of Western Contact in the late eighteenth

century, the coastal portion of the *ahupua'a* of Kealakekua had developed into an important royal complex. The general project area continued as prime agricultural lands, with the possible addition of permanent homes for farmers. Extensive cultivated fields produced taro, sugar cane, breadfruit, plantains, paper mulberry, and sweet potato. Throughout the nineteenth century, however, Kealakekua (and much of the rest of what became rural Hawai'i) saw a loss of population, as disease, low birth rates, and out-migration took their toll on the native resident population. Traditional agriculture continued for some time, with introduced crops such as oranges, grapes, pineapples, cucumbers, Irish potatoes, and watermelons (Ellis 1963:17) added to the farming milieu.

During the mid-19th century *Māhele*, the king, chiefs, and the government divided all lands among themselves, with each party relinquishing rights to the other parties' claims. The *ahupua'a* of Kealakekua and portions of adjacent Ka'awaloa were awarded to the high chief Keohokālole. Commoners were given an opportunity to claim lands (called *kuleana*) that they used, but no *kuleana* awards were made within the current project area.

As discussed in Section 3.2.2, Keohokālole mortgaged Kealakekua and thus began a series of land transactions that saw the acquisition of the *ahupua'a* in 1880 by Henry Greenwell, whose family continues to own portions of the land. Greenwell built up a dairy and ranching business through his own operations, as well as through leases to others. The current project area was part of the ranch land and has experienced extensive modification as part of ranching operation during the nearly 130-year history of Greenwell ownership.

Given the culture-historical background and the results of previous archaeological studies in the immediate project area, the archaeological expectations for the current study parcel include dryland agricultural features associated with the Kona Field System, and possible temporary habitation sites associated with agricultural fields. However, given the specific land use history of the study parcel – complete grading – it is likely that if any such features were present they have been significantly disturbed if not completely destroyed by historic and modern land-altering activities.

#### *Impacts and Mitigation Measures*

On January 2, 2007, David Nelson, B.A. under the direction of Robert B. Rechtman, Ph.D. performed a field inspection of the project area, the limits of which were clearly marked and identifiable in the field. The entire surface area of the property was visually inspected. No archaeological resources were observed within the project area and the likelihood of encountering subsurface resources is extremely remote.

Based on these negative findings, on February 12, 2007, Rechtman Consulting made a written request that the State Historic Preservation Division (SHPD) issue a written determination of “no historic properties affected” in accordance with HAR 13§13-284-5(b)1. In a letter of March 5, 2007, SHPD concurred with finding (see Appendix 3).

Work involving potential land disturbance will be strictly limited to the project site through contractor orientation and orange fencing to mark sensitive areas. In the event that archaeological

resources, Hawaiian cultural items, or human remains are encountered during future development activities within the current study area, work in the immediate area of the discovery should be halted and DLNR-SHPD contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

### **3.3 Infrastructure**

#### **3.3.1 Utilities**

##### *Existing Facilities and Services*

Electrical power to the Garden is supplied by Hawai‘i Electric Light Company (HELCO), a privately owned utility company regulated by the State Public Utilities Commission, via their island-wide distribution network. Water is provided by Hawai‘i County Department of Water Supply. Telephone service is available from Verizon Hawai‘i for the project. An individual wastewater system, shown on Figure 5 of Appendix 1, will be constructed to service the restrooms.

##### *Impacts and Mitigation Measures*

The proposed action will require extension of HELCO electrical service to the Visitor Center structure. The proposed action would not have any substantial impact on existing electrical facilities. Appropriate coordination with HELCO and Hawaiian Telcom will be conducted during the design and construction of the improvements. No other utilities will be affected in any way.

#### **3.3.2 Roadways**

##### *Existing Facilities*

Access to the Garden is currently via a driveway from Mamalahoa Highway, a two-lane County highway, located about 700 feet north of the proposed visitor center entrance on a long curve. Sight distance at the existing intersection is adequate towards the north but less adequate (about 150 feet) towards the south. Mamalahoa Highway provides the direct access to several dozen businesses (restaurants, galleries, hotels, etc.), a park and a police/fire station facility in Captain Cook, nearly all of which lack left-turn lanes off of the highway. The County Department of Public Works is currently engaging in a project to provide left-turn lanes at several *County roads* that intersect Mamalahoa Highway.

The Garden received 7,129 visitors in 2003, 9,330 in 2004, and 10,360 in 2005, and about 12,100 in 2006 (State of Hawai‘i 2006; Bishop Museum data). The Garden is open daily from 9 AM to 5 PM. On the average, about 30 visitors come each day, with an average of two persons per vehicle, creating 15 visitor trips in and 15 trips out of the facility. In addition, one to two buses typically bring visitors to the Garden per week. Peak visitation hours are between 10 AM and 3 PM (i.e., between Mamalahoa Highway peak AM traffic before 9 AM and after PM peak traffic from 3 PM on). On average, a peak hour consists of about 5 visitor trips either in or out of the facility. Staff trips account for about 12 trips in and out of the facility, with a peak of about 2 trips at 5:00 PM.

### *Impacts and Mitigation Measures*

The facility will be accessed using an existing two-lane driveway (a park road) that extends off Mamalahoa Highway and accesses the parking lot for Yano Hall and Arthur Greenwell Park. The location has superior sight distance to the current access, with adequate distance towards the north and excellent distance towards the south. The access is opposite a private access road used by a business and visitors. No sidewalks or crosswalks are present. A local business owner related that several traffic accidents involving pedestrian fatalities have occurred in this location; this resident requested that the Garden construct sidewalks, a bike lane, and left-turn pockets into the facility, and also that a traffic study be conducted to determine if a traffic signal is warranted (see Appendix 3). Another business owner spoke to Geometrician Associates by phone in response to an early consultation letter and suggested that the Garden not be allowed to utilize the Yano Hall/Greenwell Park access, and instead have visitor traffic turn *mauka* onto Kinue Road, about 400 feet south of the visitor center, turn left at “Roadway F”, and enter the property either by driving down the unpaved roadway between the park and the Garden and utilizing the existing entrance, or via a new entrance that would have to be constructed *mauka* of the proposed visitor center. This traffic pattern would take advantage of the left turn pocket being constructed for the turn-off to Kinue Road, which avoids having southbound vehicles turning left into the visitor center delaying traffic as they wait for opportunities to turn into the proposed entrance.

Although a new Visitor Center should enhance the visitor appeal of the Garden, no substantial increase in overall traffic to the Garden is expected. Instead, the project would separate some staff and visitor traffic and have visitors enter via a better and safer intersection. Even if the current peak visitor rate of about 5 vehicle trips per hour were to double, the 10 peak hour trips would still not represent a substantial volume of traffic. This is especially true considering that the peak visitor traffic is concentrated at non-peak hours for both Mamalahoa Highway use (before 10 AM and after 3 PM) and also for use of Yano Hall (late afternoons, evenings and weekends). As stated above, several dozen other businesses – many with significantly higher peak hour visits – also take access off of Mamalahoa Highway, at times causing delays for left turns. A Traffic Impact Analysis Report (TIAR) does not appear to be warranted under these circumstances.

The alternate access via Kinue Street, Road F and the road between the Garden and the County park, several factors argue against it: the additional cost of extra roadway and driveways, the fact that Road F is a privately owned road, and the very roundabout route (an extra thousand feet) that visitors to the Garden would be required to navigate. The very minor addition of traffic to the access road serving Yano Hall would not substantially affect traffic congestion or safety.

The new driveway connecting the access road and parking lot will require a permit from the Hawai‘i County Department of Public Works and must comply with Chapter 22 of the Hawai‘i County Code. The proposed action would require access to the site for construction vehicles during a period of several months for grading, construction of the visitor education center, and landscaping. The site currently serves as a staging area for construction of the Hawai‘i County road construction project. Parking is also an issue during large events, especially the annual Grow Hawaiian Horti/Cultural Festival, a free event which draws hundreds of community members and visitors. The current site of the proposed Visitor Center provides parking for such events.

## *Mitigation*

Although traffic impacts are expected to be minor and offset by the benefit of moving the intersection from its current location, in consideration of neighborhood concerns the Garden proposes the following:

- Schedule bus arrivals between 9:00 a.m. and 3:00 PM, in order to avoid conflicts with adjacent peak traffic.
- Discuss with the County of Hawai‘i the idea of cost-sharing for a crosswalk and warning signs.
- The Garden is currently investigating the use of the Kealakekua Ranch Center, Cap’s Drive-In or unused mauka Garden land as alternate parking for future events.

### **3.4 Secondary and Cumulative Impacts**

The proposed project will not involve any secondary or cumulative impacts, such as population changes or significant effects on public facilities. Although the project will provide some short-term construction jobs, these would almost certainly be filled by local residents and would not induce in-migration.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project in general – very minor and temporary disturbance to air quality, noise, visual quality during construction – are generally very limited in severity, nature and geographic scale.

Two categories of impacts, however, do merit special consideration in light of the joint impacts of past, present and future actions. Traffic along Mamalahoa Highway is heavily congested at weekday peak AM and PM hours, and any project that adds vehicles or additional driveways requires consideration from the standpoint of cumulative impacts. It is important to note, in this case, that visitor (and some staff) traffic is essentially being relocated from one less safe intersection to another safer, existing intersection. No substantial increase in traffic is thus expected, and peak traffic for the Visitor Center will not coincide with peak traffic for adjacent transportation or land use facilities (i.e., Mamalahoa Highway and Yano Hall/Arthur Greenwell Park). Mitigation in the form of bus scheduling and signage will offset any small cumulative impact.

Because of long-standing land uses that do not have drainage structures in conformance with current requirements, a drainage problem exists in the area. Additional paving associated with the current Hawai‘i County Department of Public Works project that is widening and installing turn lanes on Mamalahoa Highway is creating more runoff area. As such, it is important to minimize project-related drainage impacts and consider these impacts in terms of their cumulative effects. As detailed in Section 3.1.2, the Garden plans a drywell ~~detention pond~~ that will contain, at a minimum, additional runoff from the ~~10-25~~-year storm. This will make it one of the very few developed uses in the area that conform with current County drainage standards. As such, the Garden will be mitigating for its drainage impacts and avoiding cumulative impacts.

### **3.5 Required Permits and Approvals**

The following permits and approvals would be required:

- Hawai‘i County Building Division Approval and Building Permit
- Hawai‘i County Planning Department Plan Approval
- Hawai‘i County Public Works Department Grading and Driveway Permits

### **3.6 Consistency with Government Plans and Policies**

#### **3.6.1 Hawai‘i State Plan**

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by adding cultural educational opportunities to the South Kona district, thereby enhancing quality-of-life and community and social well-being.

#### **3.6.2 Hawai‘i County General Plan and Zoning**

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2004 (Hawai‘i County Department of Planning 2005). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Goal and Policies, and Courses of Action:

#### **Recreation 12.2 Goals**

- (a) Provide a wide variety of recreational opportunities for the residents and visitors of the County.
- (b) Maintain the natural beauty of recreation areas.
- (c) Provide a diversity of environments for active and passive pursuits.

#### **Recreation 12.3 Policies**

- (a) Strive to equitably allocate facility-based parks among the districts relative to population, with public input to determine the locations and types of facilities.
- (b) Improve existing public facilities for optimum usage.
- (c) Recreational facilities shall reflect the natural, historic, and cultural character of the area.
- (d) The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.
- (g) Facilities for compatible multiple uses shall be provided.

- (i) Coordinate recreational programs and facilities with governmental and private agencies and organizations. Innovative ideas for improving recreational facilities and opportunities shall be considered.

### **Recreation - South Kona 12.5.8.2 Courses of Action**

- (j) Develop and provide cultural facilities and programs.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to recreational facilities in Hawai'i County and South Kona.

The *Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG)*. The LUPAG map component of the *General Plan* is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as low density urban in the LUPAG. The proposed project is consistent with this designation.

*Hawai'i County Zoning.* The project site is zoned CN-7.5, neighborhood commercial district. Museums, offices and retail establishments are a permitted use in this zoning designation. Adjacent parcels are zoned residential (RS-10) and agricultural (A-1a). The property is not situated within the County's Special Management Area (SMA). The Hawai'i County Planning Department has determined that after the Bishop Museum obtained the property they did not comply with one of the conditions of Ordinance 465, effective August 22, 1979, which had rezoned the property from agriculture to CN-7.5. Condition B required the commercial project for which the rezoning was being sought to be built within 5 years, i.e., August 22, 1984. A time extension to May 18, 1998 had been granted by letter of the Planning Department on May 27, 1993, but no subsequent extension had been sought. The Museum is aware of the need to acquire another time extension and is planning to submit a request for such, or alternatively, a request to revert to the agricultural urban zoning along with an application for a Special Permit for the Visitor Center, as one of the first project tasks.

### **3.6.3 Hawai'i State Land Use Law**

All land in the State of Hawai'i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Urban District. The proposed use is consistent with intended uses for this Land Use District.

## **PART 4: DETERMINATION**

Based on the information presented in the Draft EA, and also considering comments received on the Draft EA, the Hawai'i State Department of Accounting and General Services (DAGS) has determined that the proposed project would not significantly affect the environment, as impacts would be minimal. DAGS has therefore concluded that an Environmental Impact Statement is not warranted and has issued a Finding of No Significant Impact (FONSI).

## **PART 5: FINDINGS AND REASONS**

Chapter 11-200-12, Hawai'i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost. The Amy Greenwell Ethnobotanical Garden is a unique and valuable cultural resource that would be improved by the project.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project expands and in no way curtails beneficial uses of the environment.
3. *The proposed project will not conflict with the State's long-term environmental policies.* The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State's long-term environmental policies.
4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project will benefit the social welfare of the community with the improvement of a unique educational resource and enhancement of access to public recreational facilities.
5. *The proposed project does not substantially affect public health in any detrimental way.* The proposed project will benefit public health by increasing access to recreational opportunities.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities.* No secondary effects are expected to result from the proposed action, which would simply improve existing facilities and would not induce in-migration or affect public facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality.* The project is minor and environmentally benign, and would thus not contribute to environmental degradation.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The Garden contains a number of rare, threatened and endangered plant species but none in the area impacted by the proposed construction. Impacts to rare, threatened or endangered species of flora or fauna will not occur. Proper mitigation related to Hawaiian Hawks and Hawaiian hoary bats during construction activities can minimize impacts to these species, which are relatively common in South Kona and may make occasional use of the project site.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The project is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.
10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts will preserve water quality. Ambient noise impacts due to construction will be temporary and restricted to reasonable daytime hours.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project is located in an area with volcanic and seismic risk, the entire Island of Hawai‘i shares this risk, and the project is not imprudent to construct, and employs design and construction standards appropriate to the seismic zone.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas and view planes identified in the Hawai‘i County General Plan will be adversely affected by the project.
13. *The project will not require substantial energy consumption.* Construction and maintenance of the facility will require minimal consumption of energy. No adverse effects will be expected.

For the reasons above, the proposed Action will not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statutes and section 11-200-12 of the State Administrative Rules.

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**Environmental Assessment  
Amy Greenwell Ethnobotanical Garden Visitor  
Education Center and Parking Lot**

**TMK: (3<sup>rd</sup>) 8-2-13:02**

Captain Cook, South Kona District, Hawai'i Island, State of Hawai'i

**APPENDIX 1**

**FIGURES**

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- 2. TMK Map**
- 3. Garden Layout Diagram**
- 4. Project Site Photographs**
- 5. Site Plan**
- 6. Building Elevation Profile**

Figure 1  
Location Map

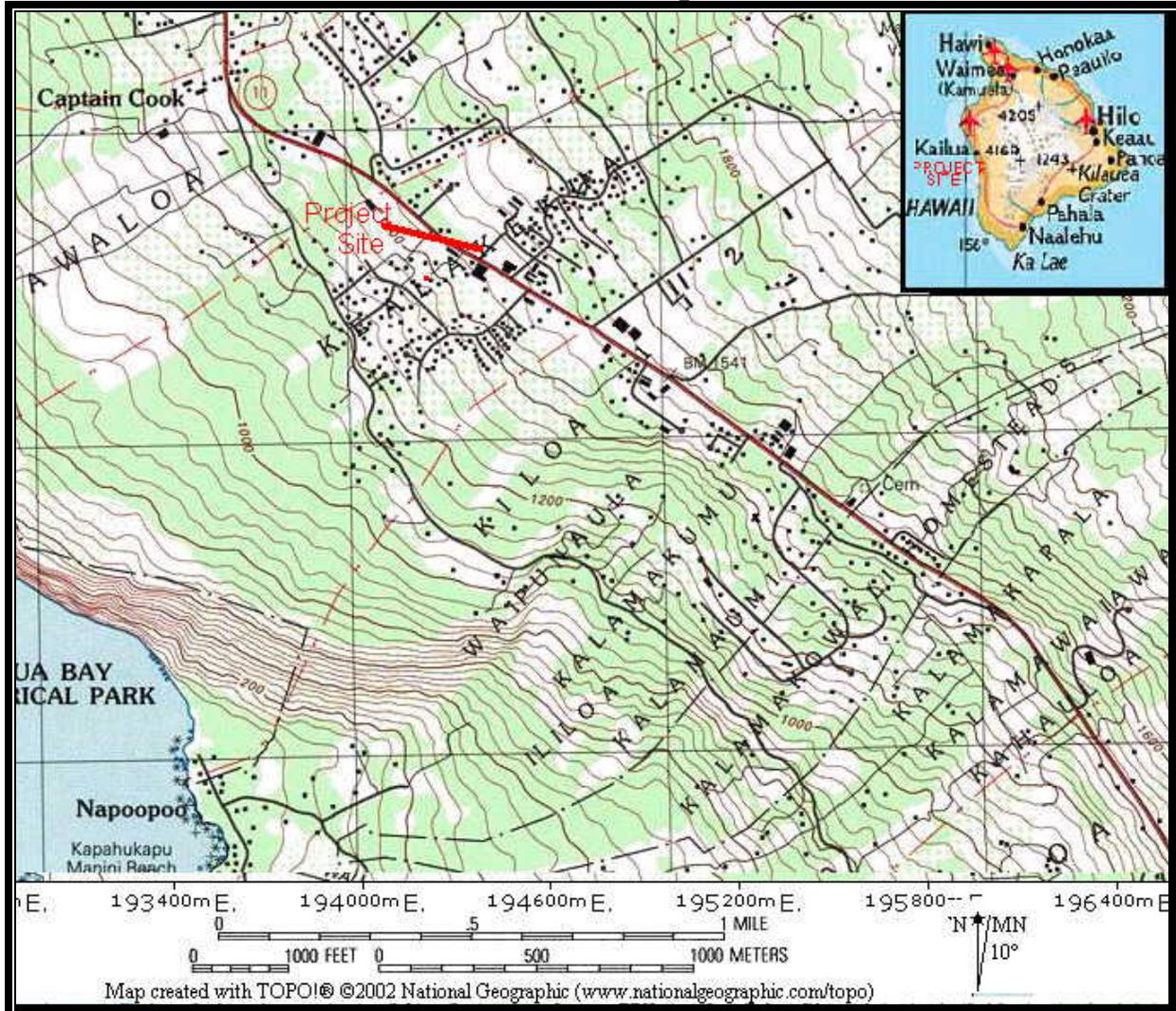
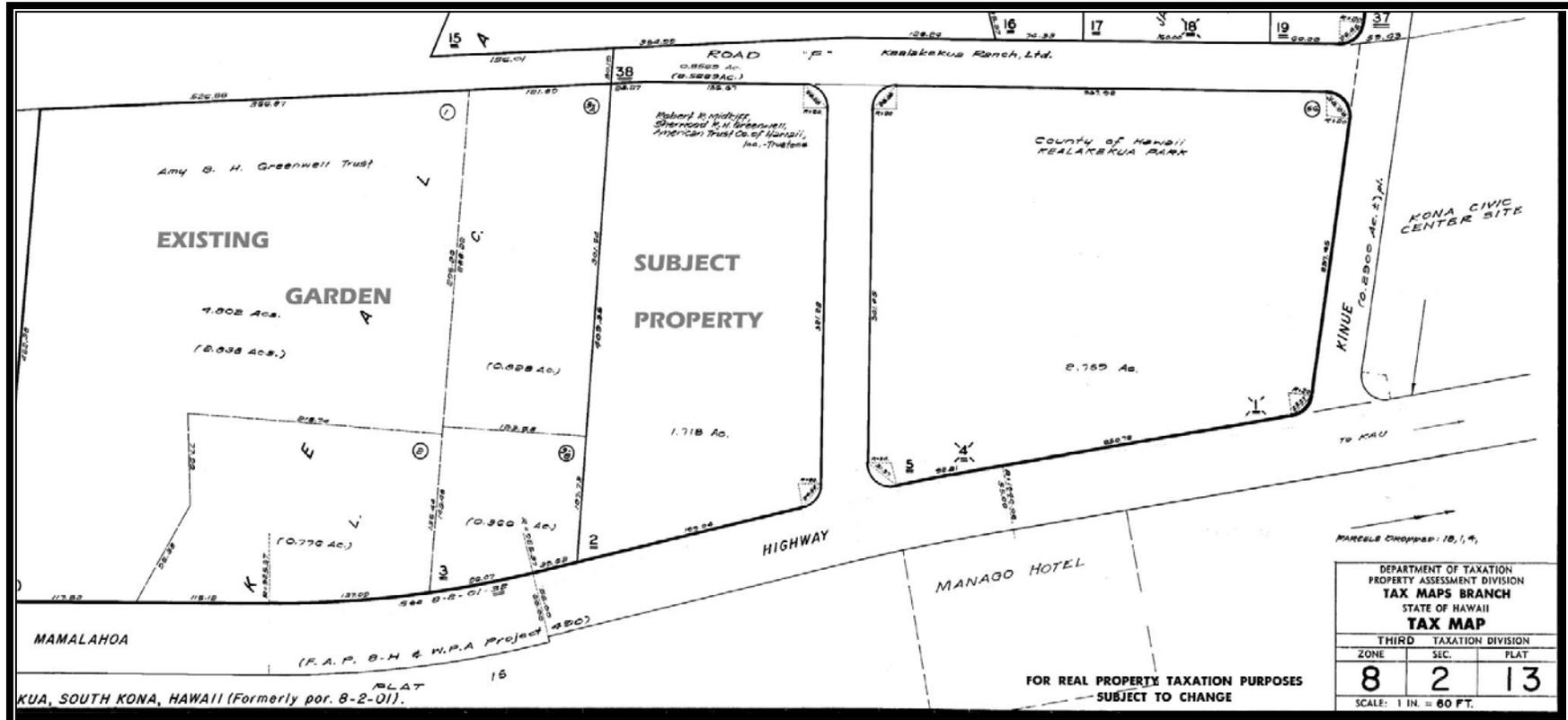
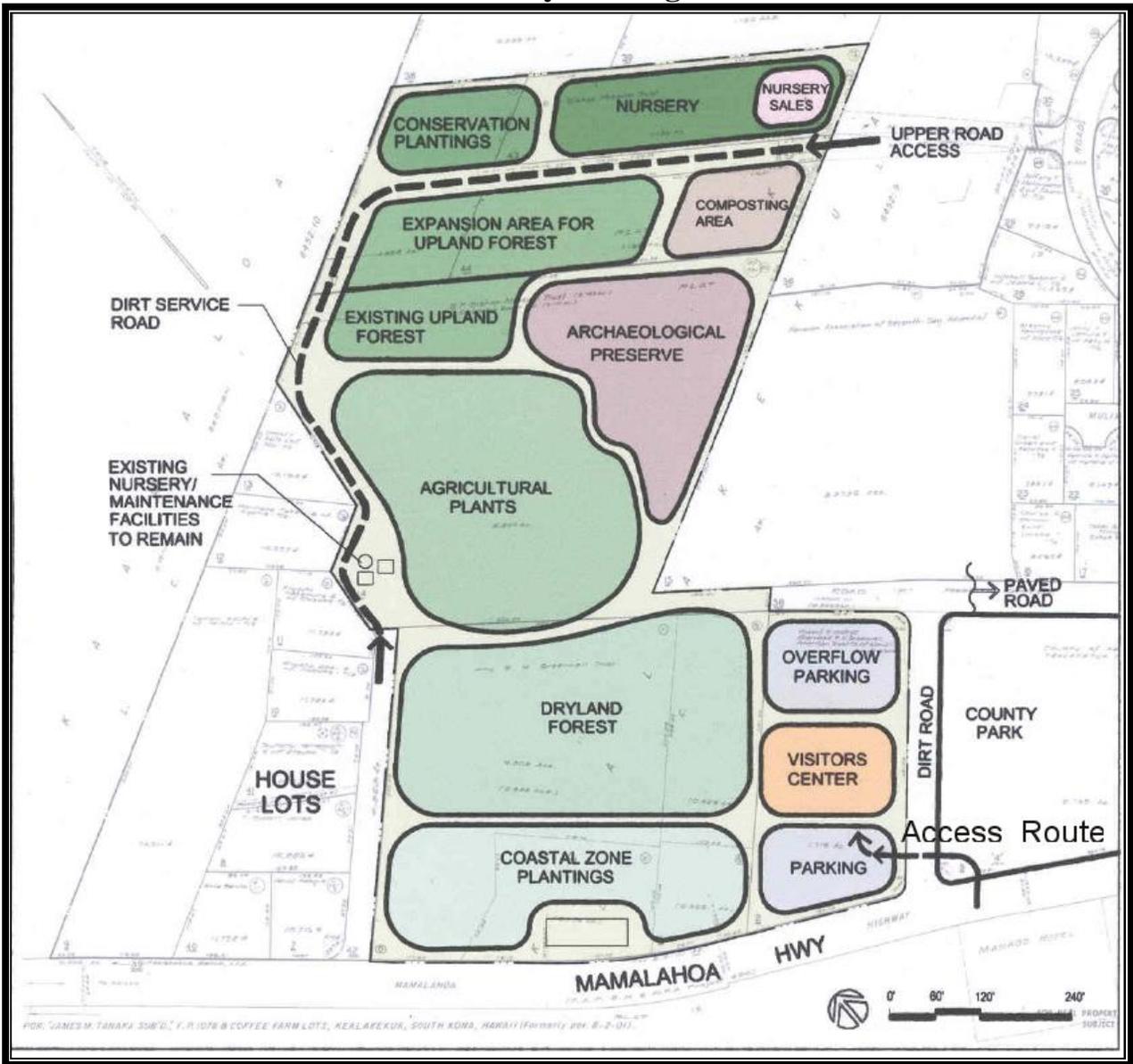


Figure 2  
TMK Map



**Figure 3**  
**Garden Layout Diagram**



**Figure 4 Project Site Photographs**



**Project Site**



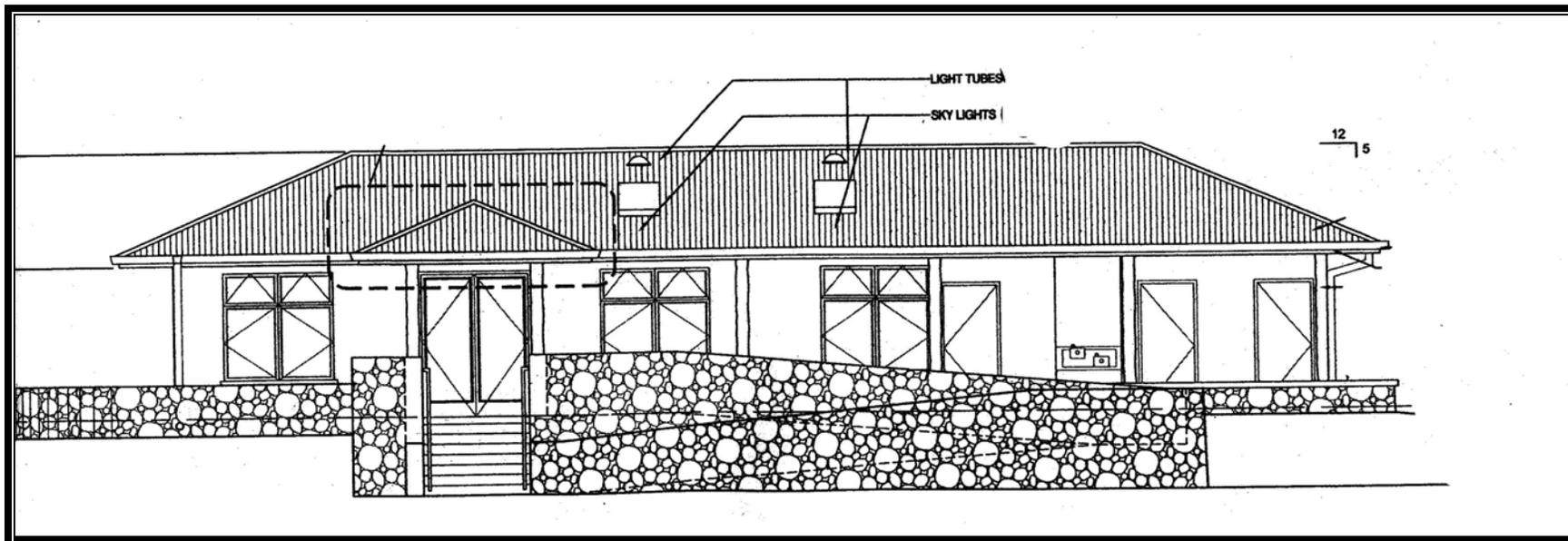
**Driveway Access to Project Site (County Park out of view to right)**



**Existing Garden Landscape**



**Figure 6**  
**Building Elevation Profile**



**Environmental Assessment  
Amy Greenwell Ethnobotanical Garden Visitor  
Education Center and Parking Lot**

**TMK: (3<sup>rd</sup>) 8-2-13:02**

Captain Cook, South Kona District, Hawai'i Island, State of Hawai'i

**APPENDIX 2**

**ARCHAEOLOGICAL ASSESSMENT**

## RECHTMAN CONSULTING, LLC

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phone: (808) 966-7636 fax: (808) 443-0065  
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ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

February 12, 2007

RC-0462

Nancy McMahon  
Kaua'i Island Archaeologist  
DLNR-SHPD  
5532 Tapa St.  
Koloa, HI 96756

Dear Nancy:

At the request of Peter Van Dyke of Amy Greenwell Ethnobotanical Garden (AGEG), and in response to your letter (DOC NO: 0611NM32), Rechtman Consulting, LLC has prepared this request for determination of "no historic properties affected" associated with the development of a visitor's center and parking lot in Kealakekua Ahupua'a, South Kona District, Island of Hawai'i (TMK: 3-8-2-13: 002) (Figures 1 and 2). The visitor's center and parking lot will be developed on a 1.718-acre property recently acquired by the Bishop Museum for this purpose. The existing AGEG is located on approximately 15-acres adjacent to the current study parcel (on TMKs: 3-8-2-13: 03, 14, 42 and 3-8-2-14: 37, 43, 44, 45). The current study parcel is situated along Mamalahoa Highway to the south of the existing AGEG, at an elevation of roughly 1,450 feet (442 meters) above sea level (see Figure 1). This general area is located on an old Mauna Loa flow (between 5,000 and 10,000 year old) (Wolfe and Morris 1996). Soil within the project area is classified as Honaunau extremely rocky silty clay loam and Honaunau extremely stony silty clay loam; both are organic soils that form in areas occupied by a combination of ash and bedrock outcroppings (NRCS web site). Vegetation within the project area consists almost entirely of low grasses and the terrain has clearly been mechanically leveled in the past (Figures 3 and 4).

The cultural and archaeological setting of the current study area is aptly described in *Gardens of Lono, Archaeological Investigations at the Amy B.H. Greenwell Ethnobotanical Garden* (Allen 2001), and is summarized and augmented here in the following discussion. The current study area is centrally located within the defined boundaries of the Kona Field System (Figure 5). This system is a dryland agricultural complex covering approximately 60 square miles between Kailua and Ho'okena (Newman 1970), from the coastline to the forested slopes of Hualālai (Cordy 1995). A large portion of this area is designated in the Hawai'i State Inventory of Historic Places (SIHP) as Site 50-10-37-6601 and has been determined eligible for inclusion in the National Register of Historic Places (NRHP).

The Kona Field System was a nearly continuous series of agricultural fields stretching from the Kaū Ahupua'a in the north to Ho'okena in the south. The fields cover approximately 34,350 acres across the slopes of Hualālai and Mauna Loa and are characterized by *kuaiwi*, walls that parallel the slope. Between the *kuaiwi*, other traditional Hawaiian planting features are present such as mounds, terraces, modified outcrops, and platforms. The Kona Field System is generally considered a dryland complex, however, water control features, *'auwai* and modified waterholes, have been documented in areas where intermittent streams were present (Allen 1984; Kawachi 1989; Schilt 1984; Rechtman et al. 2003).

The basic characteristics of this agricultural/residential system as presented in Newman (1970) have been confirmed and elaborated on by ethnohistorical investigations (Kelly 1983) and archaeological research (e.g. Allen 2001; Burtchard 1996; Cordy et al. 1991; Kawachi 1989; Rechtman et al. 2001; Schilt 1984; Walker and Rosendahl 1994; Soehren and Newman 1968; and others). Summaries are offered by Allen (2001), Cordy (1995; 2000), and Kirch (1985).

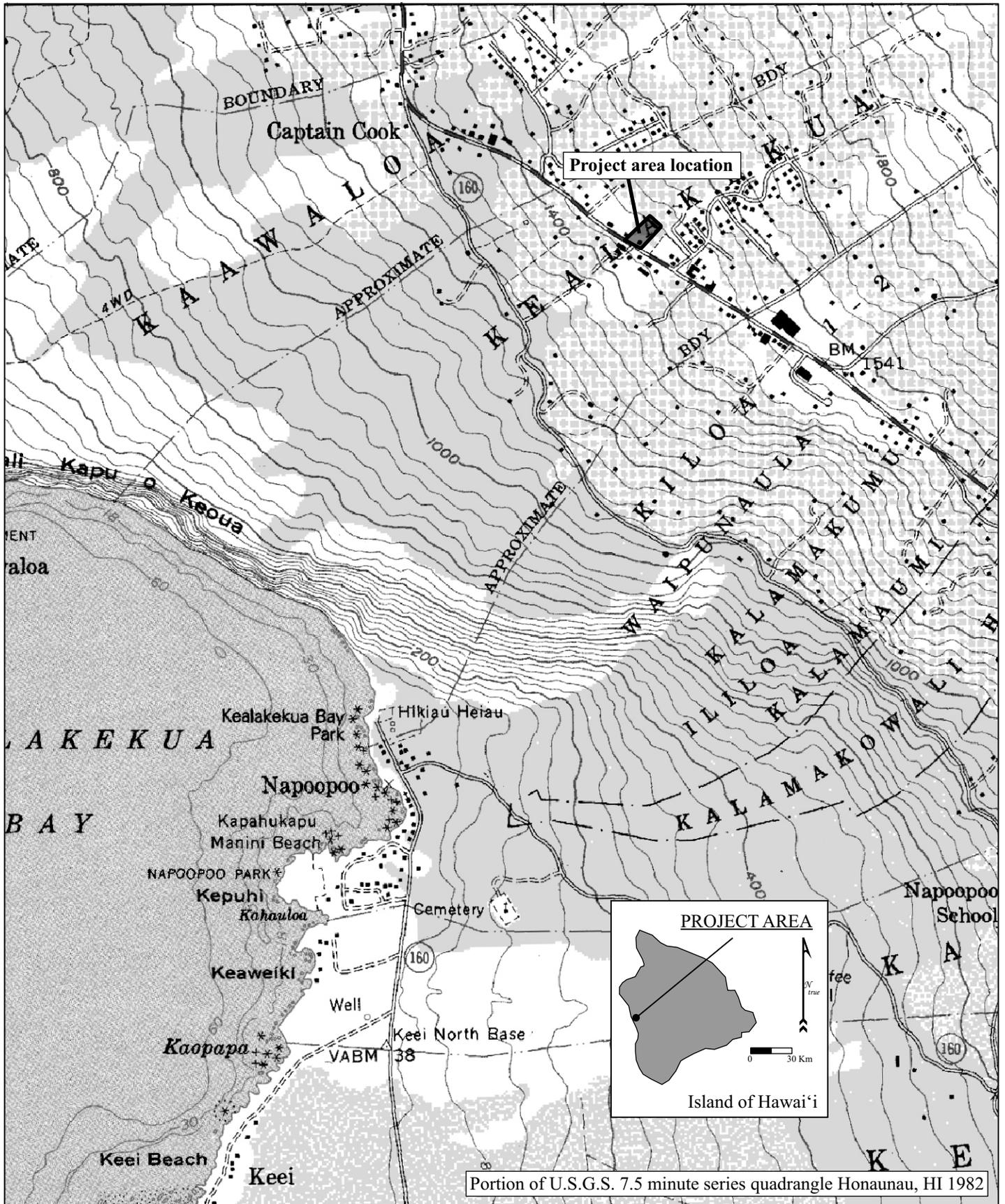


Figure 1. Project area location.





Figure 3. Portion of study parcel along Mamalāhoa Highway, view to southwest.



Figure 4. Central portion of study parcel, view to north.

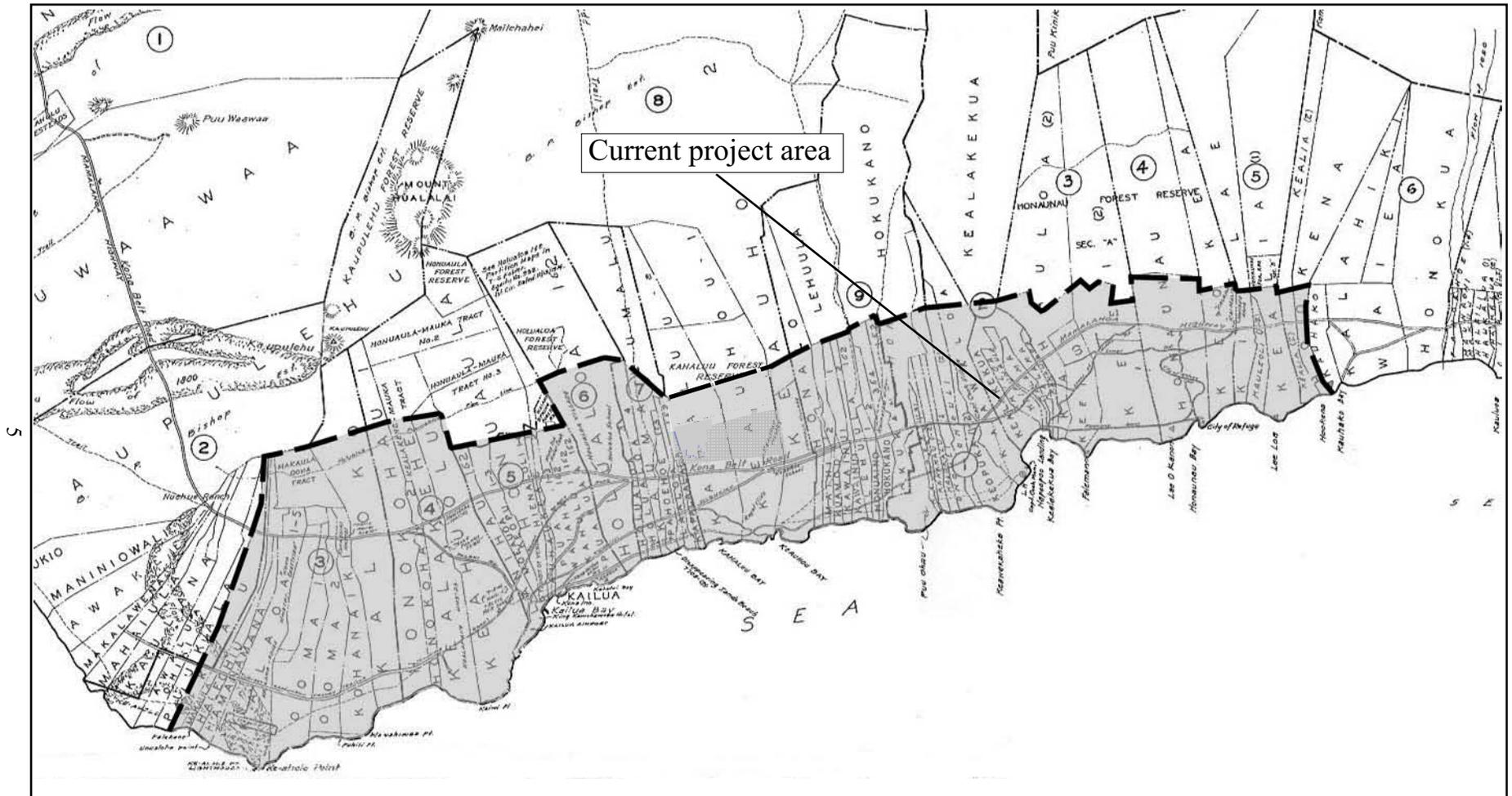


Figure 5. Geographical extent of the Kona Field System showing location of current project area.

Hawaiians traditionally used four terms to describe the major vegetation/cultivation zones (Table 1). These terms were used to define and segregate space within the *ahupua'a* and later, to delineate land claim boundaries during the *Māhele*. The zones are bands of vegetation, roughly parallel to the coast, corresponding to changes in elevation and rainfall.

**Table 1. Planting zones of Kona.**

<i>Zone</i>	<i>Annual Rainfall</i>	<i>Description</i>	<i>Elevation</i>	<i>Primary Crops</i>
<i>Kula</i>	c. 30-50 in (0.8-1.2 m)	Plain, open country inland from the coast	Coast-500 ft (0-150 m)	<i>Wauke</i> , gourd and sweet potato
<i>Kalu</i> or <i>Kalu'ulu</i>	c. 40-55 in. (1.00-1.35 m)	Luxuriant, cultivable zone	500-1,000 ft. (150-300 m)	Breadfruit, <i>wauke</i> , sweet potato, mountain apple, some taro
<i>'Āpa'a</i>	c. 55-80 in. (1.35-2.00 m)	Dry zone	1,000-2,500 ft (300-750 m)	Taro, sweet potato, sugar cane, <i>kī</i> , and banana
<i>'Ama'u</i>	c. 80 in. (2.0 m)	Upland/fern zone	2,500-3,000 ft (750-900 m)	Banana and <i>'ama'u</i> (fern)

(Adapted from Schilt 1984:6 and Allen 2001:5)

The current study area falls within the *'apa'a*. In addition to rock mound and terraces, *kuaiwi* are prominent archaeological features of the landscape within the *'āpa'a* (Cordy 1995; Newman 1970). These are typically long and broad piled stone walls that appear to have been multifunctional. The construction of *kuaiwi* was likely a by-product of land clearing as rocks were removed to create planting areas. The *kuaiwi* parallel the *mauka-makai* slope and are intersected by shorter, perpendicular retaining cross-walls. Agricultural fields are thus discernible by the rectangular pattern created by the *kuaiwi* and cross-walls.

The archaeological record contributes to our understanding of how the Kona Field System developed over time. Precisely how the record is interpreted is reflected in the various chronologies proposed for the system (Burtchard 1996; Cordy 1995; Haun et al. 1998; Hommon 1986; Kirch 1985; Schilt 1984). The chronology and terminology outlined by Haun et al. (1998) is used in the present discussion, and the chronological summary below is abstracted from Rechtman et al. (2001).

The Kona Field System was not brought to Kona as a fully developed system; but rather, it reflects a developmental adaptation to the area likely associated with the evolving sociopolitical structure and increasing population in Kona. The first inhabitants of Hawai'i Island probably arrived by at least A.D. 300 (Kirch 1985) and focused habitation and subsistence activity on the windward side of the island (Burtchard 1996; Kirch 1985; Hommon 1986). To date, there is no archaeological evidence for occupation of the Kona region during this initial stage of colonization.

There is also little indication that during the subsequent period, Early Expansion (A.D. 600 to 1100), much activity was taking place in Kona (Burtchard 1996). Through the first half of the Early Expansion Period, permanent habitation was still concentrated on the windward side. It is likely that windward residents traveled to the leeward Kona coast to procure resources (Cordy 1995). By the latter half of the Early Expansion Period, permanent habitation was beginning in Kona (Cordy 1981; 1995; Schilt 1984). Habitation was concentrated along the shoreline and lowland slopes, and informal fields were probably situated in areas with higher rainfall.

Agricultural fields and habitation areas expanded across the slopes and coastal area of Hualālai during the Late Expansion Period (A.D. 1100 to 1400) (Burtchard 1996; Cordy 1995). The earliest fields may have been located in the southern portion of the system (Schilt 1984), with new fields expanding northward over time (Haun et al. 1998).

It is likely that during the initial stages of the Intensification Period (A.D. 1400 to 1600) the construction of the extensive formal walled fields began, marking the emergence of the Kona Field System (Schilt 1984). The development of the fields may in part be a by-product of the need to extract more subsistence resources from an increasingly limited agricultural base. Radiocarbon data suggest that the population in Kona increased dramatically during this period (Burtchard 1996; Haun et al. 1998; Schilt 1984).

By the time the first European explorers began arriving in Hawai‘i, the Kona Field System had reached its greatest extent. Perhaps consequently, the native population had also reached its height. Early explorers marveled at the size and fertility of Kona’s upland plantations. Menzies, a surgeon and naturalist who accompanied Vancouver to Kealahou Bay in 1793, wrote:

For several miles round us there was not a spot that would admit of it but what was with great labor and industry cleared of loose stones and planted with esculent [taro] roots or some useful vegetable or other. In clearing the ground, the stones are heaped up in ridges [*kuaiwi*] between the little fields and planted on each side, either with a row of sugar cane or the sweet root [ti] of these islands...where they afterwards continue to grow in a wild state, so that even the these stony uncultivated banks are by this means made useful to proprietors, as well as ornamental to the fields they intersect. (Menzies 1920:75-76)

Newman, who surveyed the Kona Field System through aerial photography (Soehren and Newman 1968), suggested that the fields existed as a cohesive unit. Newman (1974) described the fields like so:

The Kona Field System is without equal in Hawai‘i, and probably in the nation in terms of the extensiveness of a prehistoric modification of the land...The system is so extensive that it cannot be seen in its entirety except from extremely high altitudes, but the physical remains are sufficiently well preserved and in such generally good condition that they may still be detected on the ground, although it is difficult to realize what is viewed is part of such a massive system...The vastness and complexity of the system show excellent practical engineering and environmental knowledge of the ancient Hawaiians, as well as the highly evolved social organization which could coordinate the labors of a multitude of people to create and maintain such a system.

Recent research and reinterpretation (e.g., Allen 1984; Burtchard 1995; Cordy 1995; Haun et al. 1998; Kawachi 1989; Kelly 1983; Kirch 1985; Newman 1970; Rechtman et al. 2001; Wolforth 1999), has painted a more realistic picture of the development of collections of widely distributed agricultural fields over time and space into a loosely affiliated sociopolitical system. In other words, the fields expanded under the influence of individuals and small groups as the populations of North and South Kona increased. As the Hawaiian sociopolitical system became more centralized, more of the agricultural produce found its way (through tribute) into the same coffers, but the fields continued to function independent of one another (Rechtman et al. 2001). Cordy (2000) describes the fields of Kona, albeit within the context of the Kona Field System, thusly:

Generally, it appears that the Kona field system gradually formed, with small clearings in the wetter uplands and some use of the kula, beginning in some ahupua‘a ca. A.D. 1000, and in others as late as the A.D. 1400’s. Then over time – with growing populations, the chiefly centers, and other factors – the fields gradually expanded and intensified. This appears likely to have taken place at different times in different ahupua‘a. By the end of the A.D. 1700’s, the fields of all these lands could be seen by the European visitors as one big complex of near continuous fields...Also these were fields of individual communities with considerable variation and differences in extent...The archaeological sites remaining probably number in the thousands. (Cordy 2000:257-258)

And, as Rechtman et al. add:

The historically observed and archaeologically documented patterns of cultivation within the agricultural fields of Kona perhaps reflect a common cultural or societal mental construct that has developed in response to centuries of experimentation under the varied geomorphic and climatic conditions of the area, but the concept of an agricultural system (with respect to defining the agricultural practices over a broad region) suggests that from one end of the region to the other (from Kaloko to Ho‘okena) the agricultural features were either temporally, functionally, or synergistically interrelated. Clearly this was not the case; that the products of these agricultural fields may have ended up (through tribute) in the same coffers tells us more about the workings of a sociopolitical system than it does about an agricultural one. (Rechtman et al. 2001)

Keeping in mind the diverse nature of the Kona Field System, the findings of the earlier archaeological study at the AGEg, adjacent of the current project area, are presented. This comprehensive study of upland archaeological features within the Kona Field System is a collection of essays on the subject incorporated into a single volume entitled *The Gardens of Lono: Archaeological Investigations at the Amy B. H. Greenwell Ethnobotanical Garden, Kealahou, Hawai'i*, edited by Melinda S. Allen (2001). This volume documents and illuminates two decades of research at the AGEg. Contributors to this volume meticulously recorded, tested, and described the quantifiable traits of many diverse agricultural features (including terraces, *kuaiwi*, and mounds) and recovered artifactual material. They also offer insights into the temporal development of the AGEg fields and apply their findings to the Kona Field System as a whole.

Allen (2001) suggests that the fields at AGEg developed over time in five phases; Phase I—the initial land use and development of early activity areas; Phase II—the construction of cross-slope terraces; Phase III—*kuaiwi* construction; Phase IV—stone mound gardening; and Phase V—historic coffee cultivation. According to Allen, development of the fields at AGEg (Phase I) began between A.D. 1400-1600 using “slash and burn” technologies. Also at this time small activity areas were cleared and utilized by the farmers building the fields. Then, following almost immediately afterwards, in areas of at least semi-permanent garden plots, cross-slope terraces were constructed (Phase II) to help prevent erosion and maintain soil. This was followed in the mid-1500s to 1600s by the construction of *kuaiwi* (Phase III), which functioned as field boundaries, clearing piles, and/or planting features. Subsequent to the stabilization of the slope and construction of *kuaiwi* came the use of stone mounds for gardening (Phase IV). These mounds could have functioned either as planting or clearing features and may represent a historic shift in agriculture stemming from an adaptation of Native Hawaiian technologies to newly introduced plant species. Finally, at the AGEg fields, Phase IV was followed by the introduction of coffee (Phase V) and a shift to a market economy in the late nineteenth century.

These late nineteenth century economic shifts were precipitated by late eighteenth and early nineteenth century events. By the time of Western Contact in the late eighteenth century, the coastal portion of the *ahupua'a* of Kealahou had developed into an important royal complex. The general project area continued as prime agricultural lands, with the possible addition of permanent homes for farmers. Extensive cultivated fields produced taro, sugar cane, breadfruit, plantains, paper mulberry, and sweet potato (Handy and Handy 1972:525-527). Throughout the nineteenth century, however, Kealahou (and much of the rest of what became rural Hawai'i) saw a loss of population, as disease, low birth rates, and out-migration took their toll on the native resident population. Traditional agriculture continued for some time, with introduced crops such as oranges, grapes, pineapples, cucumbers, Irish potatoes, and watermelons (Ellis 1963:17) added to the farming milieu.

During the mid-19th century *Māhele*, the king, chiefs, and the government divided all lands among themselves, with each party relinquishing rights to the other parties' claims. The *ahupua'a* of Kealahou and portions of adjacent Ka'awaloa were awarded to the high chief Keohokālole. Commoners were given an opportunity to claim lands (called *kuleana*) that they used, but no *kuleana* awards were made within the current project area.

Within a brief period of time, Keohokālole mortgaged Kealahou and thus began a series of land transactions that saw the acquisition of the *ahupua'a* in 1880 by Henry Greenwell, whose family continues to own portions of the land. Greenwell built up a dairy and ranching business through his own operations, as well as through leases to others. The current project area was part of the ranch land and has experienced extensive modification as part of ranching operation during the nearly 130-year history of Greenwell ownership.

Given the culture-historical background and the results of previous archaeological studies in the immediate project area, the archaeological expectations for the current study parcel include dryland agricultural features associated with the “Kona Field System,” and possible temporary habitation sites associated with agricultural fields. However, given the specific land use history of the study parcel, it is likely that if any such features were present they have been significantly disturbed if not completely destroyed by historic and modern land-altering activities.

On January 2, 2007, David Nelson, B.A. under the direction of Robert B. Rechtman, Ph.D. performed a field inspection of the project area, the limits of which were clearly marked and identifiable in the field. The entire surface area of the property was visually inspected. No archaeological resources were observed within the project area and the likelihood of encountering subsurface resources is extremely remote. Based on these negative findings, on behalf of our client, we are requesting that DLNR-SHPD issue a written determination of “no historic properties affected” in accordance with HAR 13§13-284-5(b)1.

In the unlikely event that archaeological resources are encountered during future development activities within the current study area, work in the immediate area of the discovery will be halted and DLNR-SHPD contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

Should you require further information, or wish to visit the parcel, please contact me directly.

Respectfully,

Bob Rechtman, Ph.D.  
Principal Archaeologist

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1996 *Geologic Map of the Island of Hawai'i*. Geologic Investigations Series Map 1-2524-A. U.S. Department of the Interior, U.S. Geological Survey.
- Wolforth, T.  
1999 Archaeological Inventory Survey for Residential Lot 15 in Ho'omalulu on Ali'i Development: Agricultural Use of the Upper Kula of the Kona Field System, Kaunakakai Ahupua'a, North Kona District, Island of Hawai'i. PHRI Report 1944-082099.

**Environmental Assessment  
Amy Greenwell Ethnobotanical Garden Visitor  
Education Center and Parking Lot**

**TMK: (3<sup>rd</sup>) 8-2-13:02**

Captain Cook, South Kona District, Hawai'i Island, State of Hawai'i

**APPENDIX 3**

**COMMENTS IN RESPONSE TO PRE-CONSULTATION**

Thomas Langenstein, Dir.  
License no. MAT - 927  
Lynn Langenstein  
License no. MAT - 2232



KONA  
SHIATSU  
CLINIC

MAE - 305

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P.O Box 1165  
Capt. Cook, Hawaii 96704  
phone/fax: (808) 323-3111  
E-mail:  
konashiatsu@earthlink.net

Mr. Ron Terry, rterry@hawaii.rr.com  
Geometrician Associates, L.L.C.  
P.O. Box 396  
Hilo, Hawaii 96721

October 24, 2006

Aloha Mr. Terry,

Thank you for your letter dated October 9, 2006 inviting our input to the Draft Environmental Assessment for the construction of the Amy Greenwell Visitor Education Center for the Amy B.H. Greenwell Ethnobotanical Garden (Garden). My wife and I have owned our business property, the Kona Shiatsu Clinic, for twenty years directly across Mamalahoa Hwy. We feel that the Garden has potential to be a great addition to the community.

The Captain Cook area is transitioning from a tiny commercial outpost amongst a largely agricultural community to a rural village setting including several existing and planned condo and housing developments, golf courses, and other commercial ventures. In the South Kona Community Development Plan associated with the new Hawaii General Plan, Captain Cook is designated as an area slated for high developmental growth. In order for adequate infrastructure be met for this ongoing growth, standards need to be implemented. Since this project is being subsidized by public money, it is incumbent on the County, State, or private parties to address community impacts in the planning, approval and financial procurement for growth process. I am not intimating that infrastructure needs mentioned in this paper should necessarily all come from Bishop Museum since the County Park is also a beneficiary of this project. The following are concerns related to your stated areas of investigation:

**Flooding and Drainage Impacts:** FIRM maps for this area do not represent the properties of the Garden, Greenwell Park, our property, or those below to be in a flood zone. The FIRM maps used by Hawaii County when approving projects, however, are known to be outdated and inaccurate. An existing drainage ditch, fed by runoff from above and including Mamalahoa highway, and Greenwell Park, and with a County culvert located on the makai border of the Garden property, indicates that this area is a flood zone. This drainage ditch, which runs under the highway and along the South border of our property, also affects other property owners below us. It is unimproved and unstable on properties below the highway. A drywell that is meant to mitigate some of this runoff is located within the County culvert mentioned. To date, it is often clogged with leaves and debris from a wild avocado tree growing above it. During certain times of the year, this drainage ditch runs on a weekly basis and is already causing erosion that is threatening to topple the historic rock wall that separates the Manago property from ours.

An improved shared highway entrance for the Garden and the County (see traffic impacts), an added 50-car shared parking lot, and other pervious structures developed on the Garden property, unless adequately engineered to keep drainage water on the property, will dramatically increase rainfall runoff affecting properties below. The County currently has taken a stance to approve engineered drainage mitigating structures such as drywells, for rainfall events of up to a 10-year storm event as being adequate. Naturally occurring floodwaters from rainfall events of any magnitude are unavoidable. Man-made structures designed to collect and drain surface waters onto another person's property resulting in damage, however, are avoidable. The question is, does responsibility for damage incurred to properties below, resulting from improvements made on the grounds of Greenwell Park or the Garden, end with mitigation designed for a 10-year rainfall event.

A comprehensive study on ways to improve on current County standards utilizing Best Management Practices (BMPs) such as permeable pavement and bioswales to manage quantity and quality of storm water drainage can be found on: <http://www.icpi.org/myproject/Seneca%20College%20TRCA%202006%20report.pdf> . This site includes a study of methods, comparisons with impermeable pavement, maintenance practices, costs, benefits and limitations of BMPs. This study is pertinent to consider with regard to the Garden/County project because it is of a test site that has no other municipal storm drain for management of storm water (see Fig. 3.2) and addresses mitigation of non-point source pollution. Currently there is no County comprehensive storm water plan that considers quality as well as quantity of storm water drainage.

**Water Quality Assurance, Fauna and Ecosystems:** The proposed development is located within the watershed area above Kealahou Bay and the National Wildlife Refuge and Preserve. For the purposes of preserving the pristine quality of offshore waters within Kealahou Bay, every effort available should be utilized to manage and reduce non-point source pollution that could be created at a public facility such as the Garden. Where possible, Best Management Practices mentioned above which are designed to reduce non-point source pollution on site should be utilized. Relative to Fauna and Ecosystems: Currently a burgeoning early population of coqui frog has infested the grounds of the Garden and around Greenwell Park. The infestation has not yet moved makai of the highway but if not addressed soon it is only a matter of time.

**Traffic Impacts:** Mamalahou highway serves this area as the only arterial highway going from North to South in South Kona. A large portion of the South Kona community commute from the agricultural and residential areas South of Captain Cook to predominant construction and resort jobs in North Kona and South Kohala. No new North/South highway has been added to what now exists through Captain Cook since the early 1920s; nor is one planned. The Hokuia by-pass road, when completed, will intersect Mamalahou Highway just north of Captain Cook. The Hokuia by-pass may exacerbate the Captain Cook crawl that currently occurs during 7:30-9:00 am going North and 3:00-6:30 pm going South every weekday on the section of road South of Napoopoo junction. This highway is intermittently at or beyond capacity during those times without any further growth.

If an increase of bus and private vehicular traffic will be arriving and departing the shared exit of the Greenwell Park and the Garden regularly, a traffic study of the area is indicated. Several citizens have already been killed or injured in an attempt to cross the road in front of the Manago Hotel. In an attempt to reduce further traffic snarl, an improved shared entrance to the Garden and adjoining Greenwell Park should at minimum include left lane pockets to facilitate left hand turns going into and out of the Garden and Greenwell park. Nine residences and one business (ours) use the access road on our property directly across from the Garden property, just North of the proposed shared Garden/Greenwell Park entrance. A traffic light may be indicated in order to allow ingress or egress during times of heavy traffic. Except for directly across from Manago hotel, sidewalks and bike lanes are absent in the area. A plan with timetable to implement should be made to address this.

**Flora, Social, Cultural and Community Impacts, Historic Sites, and Economic Impacts:** Given the address of community impacts mentioned (Flooding, drainage, traffic, Water Quality Assurance, Ecosystems, and Fauna), in all other areas under this investigation, this proposed development will have a positive impact on preserving historic sites and practices, providing education and positive social interaction, and spur economic growth in the Captain Cook and South Kona regions without causing further degradation of safety, quality of life and loss of property. I would like to receive a copy of the EA when completed. Thank you.

Sincerely,



Tom Langenstein

Cc: Mr. Galen Kuba, Engineering Dept. Public Works  
Ms. Ambika Kosada, Kona Soil and Water Conservation Service  
Mr. Jeff Knowles Natural Resources Conservation Service  
Ms. Noelani Whittington, County Community Outreach  
Ms. Virginia Isbell, County Councilwoman

**Harry Kim**  
*Mayor*



**Darryl J. Oliveira**  
*Fire Chief*

**Desmond K. Wery**  
*Deputy Fire Chief*

# County of Hawai'i

## FIRE DEPARTMENT

25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720  
(808) 961-8297 • Fax (808) 961-8296

October 13, 2006

Geometrician Associates, LLC  
HC 2 Box 9575  
Keaau, Hawaii 96749

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF AMY GREENWELL VISITOR EDUCATION CENTER AND PARKING LOT, TAX MAP KEY: 8-2-13-2.**

---

We have no comments to offer at this time in reference to the above-mentioned Environmental Assessment.

  
DARRYL OLIVEIRA  
Fire Chief

JCP:lpc



**Harry Kim**  
*Mayor*



**Lawrence K. Mahuna**  
*Police Chief*

**Harry S. Kubojiri**  
*Deputy Police Chief*

## **County of Hawaii**

### **POLICE DEPARTMENT**

349 Kapiolani Street • Hilo, Hawaii 96720-3998  
(808) 935-3311 • Fax (808) 961-2389

October 20, 2006

Mr. Ron Terry, Principal  
Geometrician Associates  
P.O. Box 396  
Hilo, Hawaii 96721

Dear Mr. Terry:

**SUBJECT:** Environmental Assessment for Construction of Amy Greenwell  
Visitor Education Center and Parking Lot, South Kona, Hawaii  
TMK: 8-2-13-2

Staff has reviewed the Environmental Assessment for the above-referenced project and has no comments or objections to offer at this time.

Should you have any questions, please feel free to contact Captain Paul Kealoha, Commander of the Kona District, at 326-4646, ext. 249.

Sincerely,

  
**HARRY S. KUBOJIRI**  
**ACTING POLICE CHIEF**

PK:dmv

LINDA LINGLE  
GOVERNOR



RODNEY K. HARAGA  
DIRECTOR

Deputy Directors  
FRANCIS PAUL KEENO  
BARRY FUKUNAGA  
BRENNON T. MORIOKA  
BRIAN H. SEKIGUCHI

**STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION**

HAWAII DISTRICT  
50 MAKAALA STREET  
HILO, HAWAII 98720  
TELEPHONE: (808) 933-8866 • FAX: (808) 933-8869

IN REPLY REFER TO:

HWY-H 06-2.0889

October 26, 2006

Mr. Ron Terry  
Principal  
Geometrician Associates  
P.O. Box 396  
Hilo, Hawai'i 96721

Dear Mr. Terry:

**SUBJECT:** Environmental Assessment for Construction of Amy Greenwell Visitor Education Center and Parking Lot  
Mamalahoa Highway, Route 11  
T.M.K. 3rd Div. 8-2-013:002  
Kealahou, South Kona, Hawai'i  
Project No. FAP 8-G

Thank you for your transmittal requesting our review of the subject project.

The project will not directly affect our highway facilities and is under the County of Hawaii jurisdiction for this section of the highway.

We appreciate your providing this advance notice and for the opportunity to provide comments.

If you have any questions please call Mr. Clinton Yamada at 933-1951.

Very truly yours,

*for* STANLEY M. TAMURA  
Hawai'i District Engineer

----- Original Message -----

**From:** [PENGELHARD@co.hawaii.hi.us](mailto:PENGELHARD@co.hawaii.hi.us)

**To:** [rterry@hawaii.rr.com](mailto:rterry@hawaii.rr.com)

**Cc:** [DNODA@co.hawaii.hi.us](mailto:DNODA@co.hawaii.hi.us) ; [PMizuno@co.hawaii.hi.us](mailto:PMizuno@co.hawaii.hi.us) ; [JKOMATA@co.hawaii.hi.us](mailto:JKOMATA@co.hawaii.hi.us) ; [parks\\_recreation@co.hawaii.hi.us](mailto:parks_recreation@co.hawaii.hi.us)

**Sent:** Monday, October 23, 2006 2:16 PM

**Subject:** Amy Greenwell Visitor Education Center and Parking Lot, South Kona, TMK 8-2-13-2

Aloha Ron,

You asked for comments for your Draft EA for the above referenced project.

You might like to know some of the conditions for the parking lot that we are presently working on with Bishop Museum. We will probably do a Memorandum of Agreement with them before the project gets underway.

Items that might impact an Environmental Assessment would include

- the installation of a gate at the entrance to the parking lot.
- What has been designated a road easement on the north end of the park is actually a park road, according to Public Works.
- They intend to assure that runoff from the parking lot is controlled on property.

I hope this information is helpful for your Draft EA.

Pat Engelhard

Director

PHONE (808) 594-1888

FAX (808) 594-1865



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD06/2761

November 2, 2006

Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

**RE: Draft Environmental Assessment for Construction of Amy Greenwell Visitor Education Center and Parking Lot, South Kona, Hawai'i Island; TMK: 8-2-013:002.**

Dear Ron Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of your October 10, 2006, request for comments on the above-referenced project, which would allow the Bishop Museum to develop a visitor education center at the Amy B.H. Greenwell Ethnobotanical Garden. The center would include development of a single story building (1,600 square feet), restrooms, landscaping and a 50-space, shared-use parking lot. OHA offers the following comments.

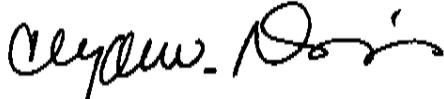
We appreciate your efforts to consult us early on this project. The Amy B.H. Greenwell Ethnobotanical Garden is a valuable asset to the community, and we look forward to receiving a copy of the Draft Environmental Assessment (Draft EA), for more thorough review. We recommend contacting Ruby McDonald of OHA's Kailua-Kona office (address below) to improve the consultation component of your Draft EA.

OHA further requests assurances from the applicant that if this project should go forward, if iwi kūpuna or Native Hawaiian cultural or traditional deposits are found during ground disturbing activities, all work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions, please contact Jesse Yorck, Policy Advocate – Native Rights, at (808) 594-0239 or [jessey@oha.org](mailto:jessey@oha.org).

Ron Terry  
Geometrician Associates, LLC  
November 2, 2006  
Page 2

Sincerely,

A handwritten signature in black ink, appearing to read "Clyde W. Nāmu'o". The signature is fluid and cursive, with a prominent loop at the end.

Clyde W. Nāmu'o  
Administrator

C: Ruby McDonald  
Community Resource Coordinator  
OHA - Kona Office  
75-5706 Hanama Place, Suite 107  
Kailua-Kona, HI 96740

**Harry Kim**  
Mayor



**Christopher J. Yuen**  
Director

**Brad Kurokawa, ASLA**  
LEED® AP  
Deputy Director

**County of Hawaii**  
**PLANNING DEPARTMENT**  
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-3043  
(808) 961-8288 • FAX (808) 961-8742

November 21, 2006

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, Hawaii 96721

Dear Mr. Terry:

**Subject: Pre-Draft Environmental Assessment Comments**  
**Project: Proposed Construction of Amy Greenwell Visitor Education Center and Parking Lot**  
**Tax Map Key: 8-2-013:002 Kealakekua, South Kona, Hawaii**

---

This is in response to your letter dated October 9, 2006 requesting our comments prior to your preparation of a Draft Environmental Assessment for the proposed project.

The subject 1.718-acre parcel is zoned Neighborhood Commercial (CN-7.5) by the County of Hawaii and is situated in the State Land Use Urban district. The project site is not in the Special Management Area. According to the County of Hawaii's General Plan Land Use Pattern Allocation Guide Map, the property is designated for low density urban uses.

The museum and visitor education center is a permitted use in the CN district. Plan Approval shall be secured from the Planning Department prior to the issuance of any Building Permit.

A portion of the subject parcel was rezoned from Agricultural (A-1a) to the current zoning by Ordinance 465 on August 22, 1979. Condition (B) of Ordinance 465 required that "construction of commercial structures shall commence on two (2) of the proposed lots within one (1) year of receipt of final subdivision approval. Construction shall be completed within two (2) years thereafter."

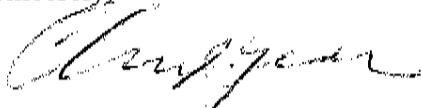
Mr. Ron Terry  
Geometrician Associates. LLC  
Page 2  
November 21, 2006

The subject property was consolidated and re-subdivided by Subdivision No. 4328 on June 26, 1979 resulting in the subject 1.718-acre parcel. By a May 27, 1993 letter from the Planning Director, a 5-year time extension to May 18, 1998 was granted to comply with the construction condition of Ordinance 435. In that compliance with Condition (B) has not yet been satisfied, a request for an additional time extension must be filed with the Planning Commission and approved by the County Council prior to granting Plan Approval for any development on the subject property.

The Planning Department requests that a copy of the completed EA be provided for our review and comment.

Should you have questions, please feel welcome to contact Larry Brown or Esther Imamura of my staff at 961-8288.

Sincerely,



CHRISTOPHER J. YUEN  
Planning Director

LMB:cd

\\Coh31\planning\public\wpwin60\Larry\EA-EIS Comments\Geometrician 8-2-12-2 Bishop Museum precmnts.doc

**Harry Kim**  
*Mayor*



**Bruce C. McClure**  
*Director*

**Jiro Sumada**  
*Deputy Director*

**County of Hawaii**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 · Hilo, Hawaii 96720-4224  
(808) 961-8321 · Fax (808) 961-8630

Dec. 6 2006

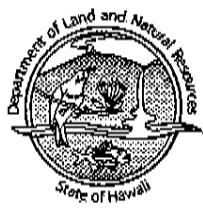
Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, Hi. 96721

**SUBJECT: Environmental Assessment for Construction of Amy Greenwell Visitor Education Center and Parking Lot, South Kona, Island of Hawaii, TMK:8-2-013:002**

Thank you for your correspondence regarding the above subject. We have no comments at this time. Please include our department in your future mailings regarding the above mentioned subject. Thank you very much and If you have any questions, please feel free to contact Kiran Emler of our Kona office at 327-3530.

Galen Kuba, Division Chief  
Engineering Division

KE



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

ROBERT K. MASUDA  
DEPUTY DIRECTOR - LAND  
  
DEAN NAKANO  
ACTING DEPUTY DIRECTOR - WATER  
  
AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAOLOAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

November 22, 2006

Ron Terry  
Geometrics Associates  
P.O. Box 396  
Hilo, Hawaii 96721

LOG NO: 2006.3852  
DOC NO: 0611NM32  
Archaeology

Dear Mr. Terry:

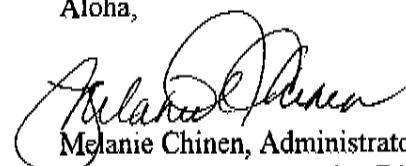
**SUBJECT: Chapter 6E-42 Historic Preservation Review – Preconsultation on EA Construction of Amy Greenwell Visitor Education Center and Parking Lot South Kona, Hawaii  
TMK: (3) 8-2-013: 002**

---

The aforementioned project is consultation on the EA for a new Visitor Education Center at the Amy Greenwell Ethnobotanical Garden. We know there are archaeological sites within the gardens, as our staff archaeologist worked for the Bishop Museum on several of the sites. We recommend that an archaeological inventory survey be conducted where the Education Center is to be built. If there are historic properties that will be impacted, then mitigation would be recommended.

If you have any questions, please contact Nancy McMahon, the Kauai Archaeologist who reviewed this project at 808.742.7033.

Aloha,

  
Melanie Chinen, Administrator  
State Historic Preservation Division

NM:jen

c: Harry Yada, DLNR- Land Division, Hawaii Island P.O. Box 936, Hilo, HI 96721  
OEQC, 235 South Beretania Street, Suite 702, Honolulu, HI 96813



**DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII**

345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAII 96720

TELEPHONE (808) 961-8060 • FAX (808) 961-8657

November 17, 2006

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

**PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION  
VISITOR EDUCATION CENTER AND PARKING LOT  
TAX MAP KEY 8-2-013:002**

This is in response to your Pre-Environmental Assessment Consultation letter of October 9, 2006.

Please be informed there is an existing 8-inch waterline within Mamalahoa Highway fronting the subject parcel. The subject parcel currently has an existing 1-inch service lateral installed to it capable of accommodating a 5/8-inch meter, which is limited to a maximum daily usage of 600 gallons per day.

Based on the proposed land use, the Department would request that the applicant submit estimated maximum daily water usage calculations, prepared by a professional engineer licensed in the State of Hawai'i, for review and approval. The water usage calculations should include the estimated peak flow in gallons per minute and the total estimated maximum daily water usage in gallons per day, including all irrigation use.

Based on the water usage calculations provided above, if the existing 1-inch service lateral cannot accommodate the estimated demand, a larger or additional meter will need to be installed and remittance of the prevailing facilities charge, which is subject to change, will be required. If the existing 1-inch service lateral *can* accommodate the estimated demand, then the applicant may have a 5/8-inch meter installed for the prevailing meter installation fee of \$75.00.

In addition, a reduced pressure type backflow prevention assembly must be installed within five feet of the meter on private property. If a larger or additional meter is required, a backflow prevention assembly will also be required for that meter. The installation of the backflow prevention assembly(s) must be inspected and approved by the Department before water commencement of water service.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

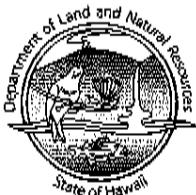
Sincerely yours,

Milton D. Pavao, P.E.  
Manager

FM:sco

*... Water brings progress...*

LINDA LINGLE  
GOVERNOR OF HAWAII



ROBERT K. MASUDA  
DEPUTY DIRECTOR - LAND

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVIYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAIHOOLAWE ISLAND RESERVATION COMMISSION  
LAND  
STATE PARKS

**STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

March 5, 2007

Ron Terry  
Geometrics Associates  
P.O. Box 396  
Hilo, Hawaii 96721

LOG NO: 2007.0494  
DOC NO: 0703NM03  
Archaeology

Dear Mr. Terry:

**SUBJECT: Chapter 6E-42 Historic Preservation Review –Revised Preconsultation on EA  
Construction of Amy Greenwell Visitor Education Center and Parking Lot  
South Kona, Hawaii  
TMK: (3) 8-2-013: 002**

The aforementioned project is consultation on the EA for a new Visitor Education Center at the Amy Greenwell Ethnobotanical Garden. We initially made our comments in November 2006 and request archaeological work. We have now reviewed the letter report received by Rechtman Consulting on February 16, 2007, who conducted a field inspection and found no sites.

We believe that **“no historic properties will be affected”** by this undertaking because:

- a) intensive cultivation has altered the land
- b) residential development/urbanization has altered the land
- c) previous grubbing/grading has altered the land
- d) an acceptable archaeological assessment or inventory survey found no historic properties (Letter Report dated February 12, 2007, Rechtman Consulting).
- e) this project has gone through the historic review process, and mitigation has been completed
- f) other:

In the event that historic resources, including human skeletal remains, are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, Kauai Section, needs to be contacted immediately at (808) 742-7033.

If you have any questions, please contact Nancy McMahon, the Kauai Archaeologist who reviewed this project at (808) 742-7033.

Aloha,

  
Melanie Chinen, Administrator  
State Historic Preservation Division

NM:jen

c: Harry Yada, DLNR- Land Division, Hawaii Island P.O. Box 936, Hilo, HI 96721  
OEQC, 235 South Beretania Street, Suite 702, Honolulu, HI 96813  
Bob Rechtman, Rechtman Consulting LLC P.O.B. 4149 Ke'au, HI 96749-9710

**Environmental Assessment  
Amy Greenwell Ethnobotanical Garden Visitor  
Education Center and Parking Lot**

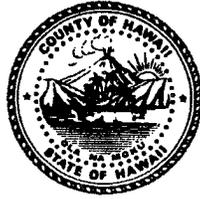
**TMK: (3<sup>rd</sup>) 8-2-13:02**

Captain Cook, South Kona District, Hawai'i Island, State of Hawai'i

**APPENDIX 4**

**COMMENTS TO DRAFT E.A. AND RESPONSES**

**Harry Kim**  
*Mayor*



**Christopher J. Yuen**  
*Director*

**Brad Kurokawa, ASLA**  
**LEED® AP**  
*Deputy Director*

**County of Hawaii**

**PLANNING DEPARTMENT**

101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224  
(808) 961-8288 • FAX (808) 961-8742

August 6, 2007

Mr. Ron Terry  
Geometrician Associates  
P.O. Box 396  
Hilo HI 96721

Dear Mr. Terry:

**SUBJECT: Draft Environmental Assessment**  
**Applicant: Bishop Museum**  
**Project: Amy Greenwell Ethnobotanical Garden Visitor Education  
Center and Parking Lot**  
**TMK: 8-2-13:2 - Land Owner: BP Bishop Museum**  
**TMK: 8-2-13:Portion of 5 - Land Owner: County of Hawaii**

This is in response to your request for comments on the above referenced project.

We note that a portion of TMK: 8-2-13:5 was added to the project subsequent to the pre-draft environmental assessment consultation.

The proposed new access will be from Parcel 5. Although Parcel 5 is zoned primarily Agricultural (A-1a), the project area appears to be zoned Neighborhood Commercial (CN-7.5). According to the General Plan's Land Use Pattern Allocation Guide Map, the property is designated Low Density Urban.

As a reminder, Ordinance No. 465 became effective on August 22, 1979. By Planning Department letter dated May 27, 1993, Comment No. 4 included the following:

Mr. Ron Terry  
Geometrician Associates  
Page 2  
August 6, 2007

*“While the change of zone ordinance does not include any language concerning this matter, with the passage of time and the representations that were made, we feel that we can honor a time extension for the compliance with condition No. B. As such, we are approving a time extension of 5 years or by May 18, 1998, to complete construction of the subject project. If this time limit cannot be met, an application will then have to be made to request for a time extension to the County Council”.*

Therefore, Part 3, Section 3.5 Required Permits and Approval, should also include County Council approval of a time extension request.

Other than the foregoing, we have no further comments to add to our letter dated November 21, 2006.

Should you have questions, please feel free to contact Esther Imamura of our department at 961-8288, ext. 257.

Sincerely,

  
CHRISTOPHER J. YUEN  
Planning Director

ETI:cd

P:\wpwin60\ETI\EAdraftPre-consul\TerryGreenwell 8-2-13-2-5 07.rtf

xc: Planning Department, Kona

Director  
Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu HI 96813

Mr. Clarence Kubo  
Hawaii State Department of Accounting & General Services  
P.O. Box 119  
Honolulu HI 96810

# geometrician

A S S O C I A T E S , L L C  
integrating geographic science and planning

phone: (808) 969-7090 fax: (866) 316-6988 PO Box 396 Hilo Hawaii 96721  
rterry@hawaii.rr.com

April 16, 2008

Christopher J. Yuen, Director  
Hawai'i County Planning Dept.  
101 Aupuni Street, Suite 3  
Hilo HI 96720

Dear Mr. Yuen:

**Subject: Draft Environmental Assessment for Amy Greenwell  
Ethnobotanical Garden Visitor Center and Parking Lot, TMK  
8-2-13:02 & 05, South Kona, Island of Hawai'i**

Thank you for your comment letter dated August 6, 2007, on the Draft EA. As the author of the EA, I am taking this opportunity to answer to your specific comments:

1. *Addition of TMK 8-2-13:5.* The property was included in the EA because of a comment in response to early consultation from the Department of Parks and Recreation, which considers the property shown as a road on the tax maps an internal road to parcel 5, based on their discussion with the Department of Public Works. Whatever the County determines the legal ownership of the road to be, the Garden would like to obtain an easement over the road to provide access to the Visitor Center.
2. *Condition B of Ordinance 465, effective August 22, 1979.* The Museum is aware of the need to acquire another time extension and is planning to submit a request for such, or alternatively, a request to revert to the agricultural urban zoning along with an application for a Special Permit for the Visitor Center, as one of the first project tasks. The Final EA has been modified to include this.

We appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project, please contact Peter Van Dyke, Manager, Amy Greenwell Ethnobotanical Garden, at 323-3318.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive style with a large, sweeping underline that extends to the right.

Ron Terry, Principal  
Geometrician Associates

Cc: Peter Van Dyke, Manager, Amy Greenwell Garden  
Clarence Kubo, Department of Accounting and General Services

Ambika Rose, 82-6103 Napo'opo'o Road, Capt. Cook, HI 96704 (808) 323-3202

August 6, 2007

Mr. Ron Terry by e-mail through Peter Van Dyke  
Geometrician Associates  
P.O. Box 396  
Hilo, HI 96721

RE: EIA- Amy Greenwell Ethnobotanical Garden Drainage

Dear Mr. Terry,

Please excuse me for commenting on the last day. I received the EIA just today, was away in July, and had received no further information from Mr. Van Dyke after inquiring about the future plans in May.

I am a Director of the Soil and Water District and requested that the topic be on our Agenda for August 14. However, please note that I am commenting as a private citizen who has had a deep concern regarding the over use of the drainage ditches makai of Mamalahoa Hwy since July of 2005 when my newly purchased farm on Napoopoo became inundated by excessive drainage scouring out the "historic ditch" through my land. This ditch [Kamekani/Takashiba] lies two south of the Greenwell/ Langanstein ditch

So I am writing to give my support to the comments by Mr. Tom Langanstein in his letter to you of August 1, 2007 [copy enclosed], which I include.

1. The ditches along Mamalahoa are over used, and any additional waters serves to worsen an already poor situation.
2. Before potential additional waters are added, whether storm run-off or potential flood waters, appropriate mapping of these ditches needs to happen. A County over-all drainage plan

Mr. Ron Terry -2- August 5, 2007

needs to be created which includes assisting private citizens with the engineering and stabilization of these ditches.

3. Only then can clear standards exist to evaluate the impact of a project such as yours.

In the meantime:

1. I would like to see a copy of the engineering study which details your plan for two detention ponds and their impact on the existing drainage. I was happy to see that you indicate you are planning to a possible 50 year event. In August 2005 such a “flashflood” was documented in the area, resulting in flooding of the Manago Hotel.

2. Will the detention areas need maintenance? If so, what is the estimated cost and is Bishop Museum prepared for that?

3. Did you consider drywells in the area? If so, why was that solution rejected?

4. Could you clarify that if at a further time you intend to add the original 50 car parking lot, that a new EIA will be conducted.

I am happy for this community discussion. I certainly appreciate the Garden and have spent time there during the Seed Exchange, and during various workshops. In fact, I have enjoyed sketching plants in the Gardens.

Mahalo,

Ambika Kosada

Mr. Ron Terry -3- August 5, 2007

cc: Tom Langenstein  
Peter Van Dyke, Bishop Museum  
Rick Robinson, Chair, KSWCD  
Brenda Ford, County Council, South Kona

enc. May 14, 2007 e-mail from Peter Van Dyke  
August 1, 2007 Tom Langenstein to Ron Terry, Geometician Associates

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April 16, 2008

Ambika Rose  
82-6103 Napo'opo'o Road  
Capt. Cook, HI 96704

Dear Ms. Rose:

**Subject: Draft Environmental Assessment for Amy Greenwell  
Ethnobotanical Garden Visitor Center and Parking Lot, TMK  
8-2-13:02 & 05, South Kona, Island of Hawai'i**

Thank you for your comment letter on the Draft EA of August 6, 2007. As the author of the EA, I am taking this opportunity to answer to your specific comments:

1. *Drainage impacts and addition of water to drainage ditch as a result of Visitor Center.* It is first important to note that the project involves a 1,600 square foot building and a 15-space parking lot with proposed drainage improvements that exceed current requirements, unlike almost any other businesses, public structures, homes or farms in the area. It will not add in any substantial way to the regional drainage problems. After review of comments on the Draft EA that did not favor a detention pond, the Garden has decided to design the project with a drywell. The new plan uses a shallow drywell to catch runoff from the improved site. The anticipated percolation rate of the drywell is 2 cubic feet per second (cfs). With the drywell in place, the net runoff from the site after the visitor center is built will be less than the runoff from the site as it is now with no construction on it, even in a storm that exceeds in severity a 50 year storm event (.99 cfs runoff from the improved site in a 50 year event versus 1.13 cfs runoff from the site without improvements). This is greater than current legal requirements and is expected to meet or exceed future requirements. Please note also that if and when Phase 2 is built, drainage will be re-analyzed and, if the drywell does not meet or exceed then-current requirements, the drywell will be upsized or another drywell constructed to meet County requirements.

2. *Overall mapping plan and drainage infrastructure.* In volunteering to design for the time being at a level that actually exceeds the 50-year storm, the Garden has already agreed to mitigate far beyond current and expected future legal requirements. It is unreasonable to expect that a very small non-profit development project like the Garden

should also undertake offsite construction to mitigate for drainage problems unrelated to the Garden that were caused by developments that have not mitigated in any way for their own drainage impacts.

3. *Copy of the drainage study.* Please contact Peter Van Dyke, who will be happy to provide you with a copy of the latest drainage study.

4. *Detention pond maintenance and drywells.* Please see the response to number one, above.

5. *New EA if parking lot is expanded.* The current Environmental Assessment includes discussion of the Phase II activities, which would take place within the same footprint and would include program space and additional parking. All impacts have been discussed in the current EA. As discussed above, the drainage improvements will meet, at a minimum, County standards, which are currently being revised to be stricter. Phase II of the project would not involve any undisclosed impacts and an additional EA would not provide any substantial new information, and therefore it would not be necessary. This determination will be reevaluated at the appropriate time.

We appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project, please contact Peter Van Dyke, Manager, Amy Greenwell Ethnobotanical Garden, at 323-3318.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive, slightly slanted style. Below the name, there is a horizontal line that tapers to a point on the right side, serving as a decorative flourish.

Ron Terry, Principal  
Geometrician Associates

Cc: Peter Van Dyke, Manager, Amy Greenwell Garden  
Clarence Kubo, Department of Accounting and General Services

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURENCE K. LAU  
INTERIM DIRECTOR

**STATE OF HAWAII  
DEPARTMENT OF HEALTH  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL**

235 SOUTH BERETANIA STREET  
LEIOPAPA A KAMEHAMEHA, SUITE 702  
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July 2, 2007

Department of Accounting and General Services  
Attn: Ernest Y. W. Lau  
P.O. Box 1119  
Honolulu, Hawaii'i 96810

Dear Mr. Lau:

Subject: Draft EA for Amy Greenwell Ethnobotanical Garden  
Visitor Center and Parking Lot,  
TMK 8-2-13:02 & p5, South Kona, Island of Hawaii

Thank you for the opportunity to review the subject document. We have the following comments.

1. On the Summary of the Proposed Action, Environmental Impacts and Mitigation measures on page ii, and also on page 6, the detention pond is described to retain runoff from a 50-year storm event. However, on page 19, last paragraph, the detention pond is described to retain runoff from a 10-year storm.

Could you please clarify the exact capacity of the detention pond?

2. Pages 6 and 7 provide clear description of stormwater management. However, Figure 5 of Appendix 1 (Site Plan) is poorly labeled and does not clearly show the detention basin at first view. One has to go back to the descriptions on the earlier pages to determine the location of different elements on the site plan.

Please re-label your site plan (Figure 5) so it's legible, especially the green lines.

3. On page 16, *Impacts and Mitigation Measures*, please verify if the date sequence on the first and second paragraphs are correct. The first paragraph talks about a January 2, 2007 field inspection. The second paragraph shows a date of February 12, 2006, negative findings.

4. Finally, please clearly draw your access roadway on the site plan. Text on page 18 states that the “facility will be accessed using an existing two-lane driveway (a park road) that extends off Mamalahoa Highway and accesses the parking lot for Yano Hall and Arthur Greenwell Park.” Yano Hall and Arthur Greenwell Park are not labeled on the site plan and there is no way of telling by looking at the site plan (Figure 5) and also on Figure 3 (Garden Layout Diagram).

Should you have any questions, please call Herman Tuiolosega at 586-4185.

Sincerely,

  
Laurence K. Lau, Esq.  
Deputy Director of Environmental Health

c: Mr. Ron Terry, Ph.D., Project Environmental Consultant  
file

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April 16, 2008

Laurance K. Lau, Esq., Deputy Director  
Hawai'i Department of Health  
Office of Environmental Quality Control  
235 S. Beretania Street, Suite 702  
Honolulu HI 96813

Dear Mr. Lau:

**Subject: Draft Environmental Assessment for Amy Greenwell  
Ethnobotanical Garden Visitor Center and Parking Lot, TMK  
8-2-13:02 & 05, South Kona, Island of Hawai'i**

Thank you for your comment letter on the Draft EA of July 2, 2007. As the author of the EA, I am taking this opportunity to answer to your specific comments:

1. *50-year versus 10-year storm.* Thank you for pointing out the discrepancy on page 19, which differed from the correct figure given in the Summary, on p. 6 (twice) and on p. 7. After review of comments on the Draft EA that did not favor a detention pond, the Garden has decided to design the project with a drywell built to handle runoff relative to pre-development conditions from a minimum 25-year storm event. The new plan uses a shallow drywell to catch runoff from the improved site. The anticipated percolation rate of the drywell is 2 cubic feet per second (cfs). With the drywell in place, the net runoff from the site after the visitor center is built will be less than the runoff from the site as it is now with no construction on it, even in a storm that exceeds in severity a 50-year storm event (.99 cfs runoff from the improved site in a 50-year event versus 1.13 cfs runoff from the site without improvements). This is greater than current legal requirements and is expected to meet or exceed future requirements. Please note also that if and when Phase 2 is built, drainage will be re-analyzed and, if the drywell does not meet or exceed then-current requirements, the drywell will be upsized or another drywell constructed to meet County requirements.

2. *Figure 5.* Figure 5 has been redrafted and printed at a larger scale so that it is more legible. I apologize for the difficulty in interpreting the figure.

3. *2006 versus 2007 for archaeological inspection and letters.* Thank you for pointing out the discrepancy of the date; both actions were in 2007, and the EA has been corrected.

4. *Access Road.* Figures 3 and 5 have been amended to better depict and label the access road.

We appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project, please contact Peter Van Dyke, Manager, Amy Greenwell Ethnobotanical Garden, at 323-3318.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive style with a large, stylized "R" and "T".

Ron Terry, Principal  
Geometrician Associates

Cc: Peter Van Dyke, Manager, Amy Greenwell Garden  
Clarence Kubo, Department of Accounting and General Services

August 1, 2007

Geometrician Associates  
P.O. Box 396  
Hilo, HI 96721  
Attention: Ron Terry

Thomas Langenstein  
P.O. Box 1165  
Captain Cook, HI 96704

Project name: Amy Greenwell Ethnobotanical Garden Visitor Education Center and Parking Lot

Aloha,

Thank you for the opportunity to review the Draft Environmental Impact Assessment for the Amy Greenwell Ethnobotanical Garden Visitor Center and Parking Lot. As a person who has a business across the street from this proposed project for over twenty years, I would like to give comment with respect to conclusions of the Draft EIS regarding the issues of Floodwater Drainage and Traffic.

**Floodwater Drainage:** Floodwater drainage from the proposed second phase car parking lot planned in phase 2 of this project represents the greatest concern to property owners below the project. The draft EIS states: "... As shown on figure 5 of appendix 1, "... runoff from the developed facility will be directed toward a detention basin located on the makai and southern end of the site. The detention basin will hold 250 cubic feet and will have a drain inlet connecting to the existing drainage ditch. Engineers calculated that 2.55 CFS of runoff would occur during a 50 year, one hour storm at the project site. The drainage improvements would detain most of this quantity on site. The connecting line will be 4 inches wide, which will allow a controlled release of drainage during a large rainfall event." ...

On page 19, under section **3.4 Secondary and Cumulative Impacts** of the draft EIS. It states: "...Because of long-standing land uses that do not have drainage structures in conformance with current requirements, a drainage problem exists in the area. Additional paving is associated with the current Hawaii Department of public works project that is widening and installing turn lanes on Mamalahoa Hwy. is creating more runoff area." ... "...the Garden plans a detention pond that will contain, at minimum, an additional runoff from the 10 year storm." ... "As such, the Garden will be mitigating for its drainage impacts and avoiding cumulative impacts."

Truly avoiding cumulative impacts would obviate the need for an overflow into the existing drainage ditch. Detaining drainage flooding is not the same as alleviating it and acknowledging existing flooding concerns does not justify adding to them. Details are lacking in the Draft EIS as to what percentage of the 250 cubic feet of water in the detention pond will be infiltrated into the soil onsite and at what point the 4 inch connecting line will achieve a "controlled release" into the drainage ditch. Other questions are: Does the 2.55 CFS of water occurring on the project site represent the amount for both phases of this project or just phase 1? During a large rainfall event at what retention point will the controlled release fail? What is the maintenance schedule for assuring that sedimentation does not degrade the capacity of the detention pond?

For many years, nearby residents and businesses have documented the negative impacts on our properties resulting from Hawaii County flood control policies or lack thereof in the vicinity of Greenwell Park. Enclosed please find appendix TL - 1, which is a report prepared by Mr. Tim Brasuell, civil engineer for the Natural Resource Conservation Service, dated June 6, 1995 file code: 210. In this report, Mr. Brasuell outlines existing conditions and necessary mitigation methods if continued overflow were to be planned to enter this ditch.

A drywell was installed mauka of the highway to mitigate small rainfall events. No stabilization to the edges of the ditch below the highway has been implemented to mitigate large rainfall events.

In the first paragraph on page 7 the draft EIS accurately states that Hawaii County has already approved or allowed development which has created flooding problems with insufficient flood drainage mitigation for this area. As of this date, no comprehensive flood study for South Kona consistent with FEMA guidelines has been updated since 1977. Further, the drainage ditch acknowledged in section **3.1.2 Drainage, Water Features and Water Quality /Existing Environment**, on page 6, paragraph 1, states that the individual FIRM maps for the Garden parcel updated in 1988, show that the project is in flood zone X outside of the 500 year floodplain. During the rainy season, (approximately April to August) this drainage ditch runs frequently despite the drywell mentioned. I have observed times when portions of this ditch have been overtopped. This would lead one to believe that this flood channel is not natural, but man-made. For property owners below the highway to manage the erosion affects of this unwanted water would not only be very expensive, but also would expose us to liability to property owners below us affected by our efforts.

For this reason, expecting property owners below the Garden project to accept any increase in drainage water introduced into the ditch without the County first accepting responsibility to engineer and stabilize the channel is untenable. Regardless of County standards, a rainfall event exceeding a 50-year statistical probability is a certainty. The destructive power of such an event is obviously far greater than the 10 or 25 year event. Should this project proceed, resulting in damage to property owners below, the State of Hawaii, County of Hawaii, and Bishop Museum can be held responsible for the damage caused by the increase in flow and velocity.

I have shared research obtained on the Internet relating to established methods utilizing permeable pavement, bio-swales, and other techniques with the Garden director, County of Hawaii Public Works and the EIS consultant in an attempt to facilitate a goal of zero additional water into the ditch. If this cannot be attained, please stabilize the ditch and plan for overflow so that it doesn't affect others.

**Traffic:** I believe the project represents a notable cumulative impact to the people using our access road with respect to ingress and egress onto Mamalahoa Hwy. for the following reasons:

1. The growth in number of garden visitors from 2003 to 2006 was 41 percent over three years (last paragraph on page 17). No rationale is given as to why no growth in traffic to the Garden is expected, but the Draft EIS admits that it does not take into consideration the acknowledged "enhanced visitor appeal" that improvements to the Garden and parking for Greenwell Park represent.
2. Visitors to the Garden and Greenwell Park often come in groups. Currently, during times when the Garden has special events such as the Farmers Seed Exchange, or Greenwell Park hosts community meetings, senior citizen events, or other events during on or off peak traffic hours, numbers of visitors wildly exceeding the average numbers recognized in the draft EIS utilize the proposed entryway and use all available parking for short periods. The draft EIS acknowledges no such traffic associated with Greenwell Park or even local businesses now sharing this additional parking space. Thank you.

Sincerely,



Thomas Langenstein

Cc: Office of Environmental Quality Control  
Hawaii State Dept. of Accounting and General Services  
Kona Soil and Water Conservation District Board



United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

P. O. Box 636  
Kealahou, HI  
96750-0636  
Tel (808) 322-2484  
Fax (808) 322-3735

Appendix - TL-1

Subject: Trip Report  
Langenstein flooding

Date: June 6, 1995

To: S. Higa, DC

File Code: 210

Per your request for a site visit today, it appears that the Langenstein property is experiencing some erosion along a historical drainageway at the southern end of the parcel. A single barrel culvert under Hwy 11 is outletting to this drainageway. Mr. Langenstein states that there has been an increase in flow in this drainageway due to drainage channel modifications mauka and also from driveway improvements from the southern parcel. He is also concerned that the County is planning a parking lot directly across the highway and that this will increase the runoff and consequently the flow into this drainageway. He also reports that the northern edge of his drive is eroding due to excess runoff from Hwy 11.

The drainageway was walked from the proposed parking lot location down to Kinue St. to determine if the drainageway stabilizes. The drainageway runs along the southern boundary of several parcels and homesites. A 4' wide by 2' box culvert is located at the makai property line of the Langenstein property. There is evidence of overtopping of this culvert. There is a 4-6 ft. vertical drop in the steep drainageway approx. 100 feet downstream of the Langenstein parcel. At the upstream end of the last parcel, there is a small concrete basin currently full of sediment. Towards the downstream end of this parcel heavy Wedelia appears to have stabilized the drainageway before it is intercepted by a concrete channel (approx. 2 foot deep, 1 foot wide) which diverts the water into a single barrel culvert under Kinue St. This culvert is plugged with debris at the downstream end. The concrete channel shows evidence of overtopping in recent past.

Comments:

1. May be helpful to locate County's parking lot plans to assure that drainage to a stable outlet is addressed.
2. Installing an asphalt berm (speed bump) in the driveway sloped towards the culvert outlet with a small Concrete-Rock-Masonry (CRM) ditch may help with the highway runoff.
3. This drainageway is eroding in several locations downstream of the Langenstein parcel.
4. Potential solution for the eroding, unstable drainageway: Due to the steep slopes and limited area available, a lined channel (rock, grout) may be the only solution similar to the CRM/asphalt channel mauka of the culvert. At least one drop structure is probable. If more area were available, a stable grassed waterway may be possible.
5. Any potential solution must include detailed hydrology in this mostly urban setting.
6. The concrete debris basin and the outlet end of Kanue St. culvert should be cleared of sediment & debris.

*Tim Brasuell*

Tim Brasuell  
Civil Engineer

cc: G.Klofstad, SCE  
J.Lum, ASCE

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April 16, 2008

Thomas Langenstein  
P O Box 1165  
Captain Cook HI 96704

Dear Mr. Langenstein:

**Subject: Draft Environmental Assessment for Amy Greenwell  
Ethnobotanical Garden Visitor Center and Parking Lot, TMK  
8-2-13:02 & 05, South Kona, Island of Hawai'i**

Thank you for your comment letter dated August 1, 2007, on the Draft EA (please note that it is not an EIS). As the author of the EA, I am taking this opportunity to answer to your specific comments:

1. *Floodwater drainage.* In deference to concerns regarding having the detention pond utilize a controlled release of water into the drainage ditch, the project is now designed with a drywell built to handle runoff relative to pre-development conditions from a minimum 25-year storm event. The new plan uses a shallow drywell to catch runoff from the improved site. The anticipated percolation rate of the drywell is 2 cubic feet per second (cfs). With the drywell in place, the net runoff from the site after the visitor center is built will be less than the runoff from the site as it is now with no construction on it, even in a storm that exceeds in severity a 50-year storm event (.99 cfs runoff from the improved site in a 50-year event versus 1.13 cfs runoff from the site without improvements in that event). This is greater than current legal requirements and is expected to meet or exceed future requirements. Please note also that if and when Phase 2 is built, drainage will be re-analyzed and, if the drywell does not meet or exceed then-current requirements, the drywell will be upsized or another drywell constructed to meet County requirements.

Thank you for providing the assessment by the NRCS engineer. The statement on p. 19 concerning the 10-year storm was incorrect; the correct figure is now the 25-year storm, which the document now states. We apologize for the error. Concerning phasing, all drainage structures will be sized to meet or exceed the requirements for the 25-year storm. If and when Phase 2 is built, the drywell will be upsized or another drywell constructed to meet this requirement.

2. *Traffic impacts, regular operations.* Contrary to your statement, the Draft EA does consider the effect of the potential increase in traffic, and fact states that “Even if the current peak visitor rate of about 5 vehicle trips per hour were to double, the 10 peak hour trips would still not represent a substantial volume of traffic. This is especially true considering that the peak visitor traffic is concentrated at non-peak hours for both Mamalahoa Highway use (before 10 AM and after 3 PM) and also for use of Yano Hall (late afternoons, evenings and weekends). As stated above, several dozen other businesses – many with significantly higher peak hour visits – also take access off of Mamalahoa Highway, at times causing delays for left turns. The important point is that no increase would occur that would provide a traffic problem during normal events at the Garden. Indeed, the project will separate some staff and visitor traffic and have visitors enter via a better and safer intersection.

3. *Traffic impacts, special events.* It is acknowledged that the Garden does have occasional special events for community benefit that draw larger numbers of people. Generally held on weekends, they do not affect weekday peak hour traffic but can sometimes pose temporary inconvenience for some motorists and local residents. The Garden is currently investigating the use of alternate parking areas, including the Kealakekua Ranch Center, other commercial areas in Captain Cook, and three acres in the mauka part of the Garden. This information has been included in the Final EA.

We appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project, please contact Peter Van Dyke, Manager, Amy Greenwell Ethnobotanical Garden, at 323-3318.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive, slightly slanted style. Below the name, there is a small, horizontal flourish or underline.

Ron Terry, Principal  
Geometrician Associates

Cc: Peter Van Dyke, Manager, Amy Greenwell Garden  
Clarence Kubo, Department of Accounting and General Services



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD07/2761B

August 9, 2007

Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

**RE: Draft Environmental Assessment for Construction of Amy Greenwell Ethnobotanical Garden Visitor Education Center and Parking Lot, South Kona, Hawai'i Island; TMK 8-2-013:002**

Dear Ron Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of your July 9, 2007, request for comments on the above-referenced project. The proposed visitor education center at the Amy B.H. Greenwell Ethnobotanical Garden would include development of a single story building (1,600 square feet), restrooms, landscaping, and a 50-space, shared-use parking lot. OHA offers the following comments.

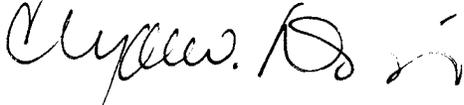
We believe the development of a visitor education center and parking lot at the Amy Greenwell Ethnobotanical Garden will serve as an essential educational resource for schools, visitors, cultural practitioners, and researchers within Hawai'i County. The visitor education center and gardens will serve to educate the public regarding traditional Hawaiian agricultural methods utilized during the times of the Kona Field System and the changes that occurred in the Kona landscape after foreign contact. We appreciate your consultation with cultural practitioners and their ongoing participation in the development of such an important cultural resource.

Although no historic properties were found during the archaeological assessment, we rely on your assurances that if the project goes forward, should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during ground disturbance or excavation, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Ron Terry  
Geometrician Associates, LLC  
August 9, 2007  
Page 2

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Heidi Guth at (808) 594-1962 or e-mail her at [heidig@oha.org](mailto:heidig@oha.org).

Sincerely,

A handwritten signature in black ink, appearing to read "Clyde W. Nāmu'o". The signature is fluid and cursive, with a large initial "C" and a stylized "W".

Clyde W. Nāmu'o  
Administrator

C: Lukela Ruddle  
Community Resources Coordinator  
OHA – Hilo Office  
162 A Baker Avenue  
Hilo, HI 96720-4869

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rterry@hawaii.rr.com

April 16, 2008

Clyde Nāmu‘o, Administrator  
Office of Hawaiian Affairs  
711 Kapiolani Blvd., Suite 1250  
Honolulu HI 96813

Dear Mr. Nāmu‘o:

**Subject: Draft Environmental Assessment for Amy Greenwell  
Ethnobotanical Garden Visitor Center and Parking Lot, TMK  
8-2-13:02 & 05, South Kona, Island of Hawai‘i**

Thank you for your comment letter dated August 9, 2007, on the Draft EA. The Garden sincerely appreciates your support for the project. As the author of the EA, I am taking this opportunity to answer to your concern about skeletal remains or Native Hawaiian cultural or traditional deposits. Please be assured that the Garden takes its responsibility for preserving the cultural heritage very seriously and educates its contractors about the requirement to cease work and contact the appropriate authorities and Garden staff if they encounter any human skeletal remains or historic resources.

We appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project, please contact Peter Van Dyke, Manager, Amy Greenwell Ethnobotanical Garden, at 323-3318.

Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: Peter Van Dyke, Manager, Amy Greenwell Garden  
Clarence Kubo, Department of Accounting and General Services