



APPENDIX G

Agricultural Impact Assessment



Waikapu Country Town

Agricultural Impact Assessment



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I. EXECUTIVE SUMMARY

A. WAIKAPU COUNTRY TOWN MASTER PLAN

The proposed Waikapu Country Town (WCT) is situated in Central Maui, just south of the small plantation community of Waikapu, at the Maui Tropical Plantation (MTP).

The project area encompasses approximately 59 acres of State Urban District lands and 1,517 acres of State Agricultural District lands (See: Figure No. 5, “State Land Use Designation”). The existing MTP retail shops, restaurant, convention hall, tropical gardens and lagoon are on the urban designated lands. Approximately 443 acres are proposed to be re-designated from the State Agricultural District to the State Urban and Rural Districts.

WCT will be a “complete community,” encompassing a mixture of rural, single- and multi-family residential units, commercial, and civic uses. In accordance with the Maui Island Plan (MIP), WCT includes 1,433 residential units together with neighborhood retail, commercial, a school, parks and open space. The town will be bound by agricultural lands that will be preserved in perpetuity through a conservation easement. WCT will be built both mauka and makai of Honoapiilani Highway. Access to the project will be from Honoapiilani Highway and the proposed Waiale Bypass road.

B. PURPOSE AND SCOPE OF THE AGRICULTURAL IMPACT ASSESSMENT

The Agricultural Impact Assessment (AIA) will assess the long-term impact of the project on the State and County’s Agricultural industry.

The scope of the study includes the following tasks:

- Assessment of the current status of Hawaii’s agricultural industry;
- Assessment of the current availability of agricultural lands;
- Analysis of existing agronomic conditions within the project site;
- Description of the recent agricultural history of the property;
- Assessment of the impact of the project on current agricultural operations; and
- Analysis of the project’s consistency with State and County agricultural policies.

C. STATUS OF HAWAII’S AGRICULTURAL INDUSTRY

While agriculture, predominantly sugar and pineapple, dominated Hawaii’s economy from the late 1800s through the 1950s, its overall significance has declined dramatically since the advent of mass market tourism. In 1927, sugar alone created 56,600 jobs, whereas in 2011 the entire agricultural industry employed just 6,900 workers.ⁱ In 2011, agriculture employed 1,600 Maui County workers, which was 2.4% of the 67,200 wage and salary jobs in the County.ⁱⁱ

Hawaii farmers face stiff competition in local, national, and international markets. In the local market, off-shore suppliers dominate the market for most fresh fruits, vegetables, dairy, meat, and poultry products. It has been estimated that 85% of all food consumed in Hawaii statewide is imported.

In the U.S. Mainland market, Hawaii growers have sustained the value of their sales in recent years, but have lost significant export value in sales to Japan. Significant impediments to agricultural development in Hawaii include high labor costs, high transportation costs, high energy costs and high land costs.

Despite major challenges, Hawaii’s growers are competitive in many niche products and opportunities are available. Because 85% of food consumed in Hawaii is imported, a significant

market exists for farmers who can find creative ways to displace imports. Moreover, Hawaii's seed crop industry has demonstrated that Hawaii agriculture can have significant comparative advantage in some sectors. Substituting locally grown biofuels for imported petroleum may also provide opportunities for Hawaii farmers over the coming decades.

D. STATE AND COUNTY AGRICULTURAL LANDS

Since 1960, there has been a release of approximately 316,590 acres from crop farming, primarily sugar and pineapple.ⁱⁱⁱ While some of these lands have been absorbed by urban development and other agricultural uses, much is fallow and available on Oahu, Maui, Molokai, Lanai and Kauai.

The County of Maui has approximately 402,354 acres within the State Agricultural District. Of these lands, approximately 244,088 acres, or 61%, is located on Maui.^{iv} Using the LSB rating system, Maui alone has approximately 82,592 acres that are classified "A", "B", or "C".^v Since 1960, there has been a release of approximately 64,150 acres from crop farming, primarily sugar and pineapple, within the County.^{vi} While some of these lands have been absorbed by urban development and other agricultural uses, much is fallow and available on the islands of Maui, Molokai, and Lanai.

Although there is an abundant supply of productive agricultural land, access to affordable agricultural lots offering long-term tenure remains an impediment to agricultural development in Hawaii. The current shortage of available State and County agricultural park lots is symptomatic of this issue.

E. IMPACT OF DEVELOPING THE PROJECT

The Waikapu Country Town, including its adjoining agricultural lands, comprises approximately 1,675 acres, 50 acres of which are within the State Urban District. Approximately 92% of WCT agricultural lands, or 1,495 acres, are rated "A" or "B" by the Land Study Bureau (LSB).

According to the Agricultural Lands of Importance to the State of Hawaii (ALISH) rating system, 97%, or 1,576 acres, is “Prime” agricultural land.

The project will result in the urbanization of approximately 450 acres of prime agricultural land. This represents a very small percentage of agricultural lands statewide and on Maui. There are approximately 2 million acres in the State Agricultural District. The subject development represents just .022% of this area. On Maui, there are approximately 82,582 acres of agricultural lands rated by the LSB as A, B, or C. The subject development represents just 0.54% of these lands. Within Maui County, approximately 64,150 acres has been released from crop production since 1987. The subject development represents just 0.7% of these lands. The MTP’s agricultural component includes nearly 1,100 acres of land that will remain in agricultural use. Of these lands, approximately 800 acres will be permanently dedicated to agricultural use with no residential structures to be permitted. Several hundred acres of MTP’s agricultural lands may be developed as a private agricultural park to help facilitate Maui’s agricultural development.

There are currently three commercial farms farming MTP lands. These include Kumu Farms, Hawaii Taro LLC, and HC&S. The proposed urbanization will require both Kumu Farms and Hawaii Taro LLC to relocate their agricultural operations to the land owners’ proposed agricultural park, which will be located on lands to be preserved in perpetuity by the land owner for agricultural use. The project will also impact a portion of the current lands being leased by HC&S. It is anticipated that these lands will gradually begin to be impacted in about five to ten years. Over the long-term, HC&S may lose approximately 330 acres to urbanization and up to an additional 75 acres to a private agricultural park. According to HC&S General Manager, Mr. Rick Volner, HC&S would desire to continue farming its MTP lands to maximize its current economy of scale in production. However, Mr. Volner acknowledged that HC&S has additional lands available that are currently fallow and that urbanization of a portion of its MTP leased lands will not significantly impact the Plantation’s long-term economic viability.

A significant impediment to agricultural development on Maui, and throughout the state, is the scarcity of agricultural land that is both readily available and affordable for long-term lease to diversified farmers. The establishment of a centrally located agricultural park, with productive lands and affordable irrigation water, should help Maui farmers compete in local, mainland and international markets.

F. CONSISTENCY WITH STATE AND COUNTY AGRICULTURAL POLICIES

The Hawaii State Plan and State Functional Plans establish policy to protect the viability of the sugar and pineapple industries, protect agriculturally suitable lands for future agricultural needs, and promote the growth of diversified agriculture.

The Maui County General Plan (County-wide Policy Plan, Maui Island Plan, and Wailuku-Kahului Community Plan) seek to preserve productive agricultural lands and facilitate agricultural self-sufficiency in food production. The plans also recognize the need to provide sufficient land areas to accommodate future population growth. Goal 7.1.1.f of the Maui Island Plan (MIP) states, *“Strongly discourage the conversion of productive and important agricultural lands (such as sugar, pineapple, and other produce lands) to rural or urban use, unless justified during the General Plan update, or when other overriding factors are present.”*

The subject land was placed into an Urban Growth Boundary during the General Plan update, when other overriding factors were present. These factors included the land’s development suitability, as well as its proximity to existing employment, infrastructure, public facility systems and existing urban development. Moreover, as documented in this report, the urbanization of the subject lands will not significantly impact the future viability of the sugar or pineapple industries or the growth of diversified agriculture.



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The proposed action has been carefully analyzed for its short- and long-term impacts upon the agricultural industry. While the proposed action will result in the loss of prime agricultural lands, it will not significantly impact the short- or long-term viability of agriculture in Hawaii since an abundance of currently fallow land remains available. The project will, however, help to address the current shortage of agricultural park lots by establishing a new park within Central Maui.

The project represents a carefully considered approach to land development that balances the need for urbanization with the desire to protect agricultural lands and other important natural and environmental resources. This approach is consistent with the spirit of existing State and County policies to protect agricultural lands.

II. INTRODUCTION

A. BACKGROUND

In December, 2012, the County of Maui adopted the Maui Island Plan (MIP). The MIP establishes goals, objectives, policies and actions to direct growth and development on Maui through the year 2030. The MIP was based upon a comprehensive analysis of population growth, economic conditions, development capacity of existing entitled lands, and extensive community outreach.

To guide development of future urban lands, the MIP sets forth policies requiring higher urban densities, a greater balance between single- and multi-family housing types, mixed-use development, vehicular and pedestrian connectivity between land uses, and the incorporation of parks, schools, open space and affordable housing into future developments.

The MIP's Directed Growth Plan places approximately 502 acres of Waikapu Country Town's (WCT's) 1,576 acres into urban and rural growth boundaries. The remaining 1,074 acres are to remain within the State's Agricultural District. Of these lands, approximately 800 acres will be preserved in perpetuity for agricultural use through a conservation easement, and the remaining 274 acres will be kept in large agricultural lots (See: Figure No. 1a-b, "Maui Island Plan Map Directed Growth Map" and "Maui Island Plan Wailuku/Kahului Planned Growth Areas").

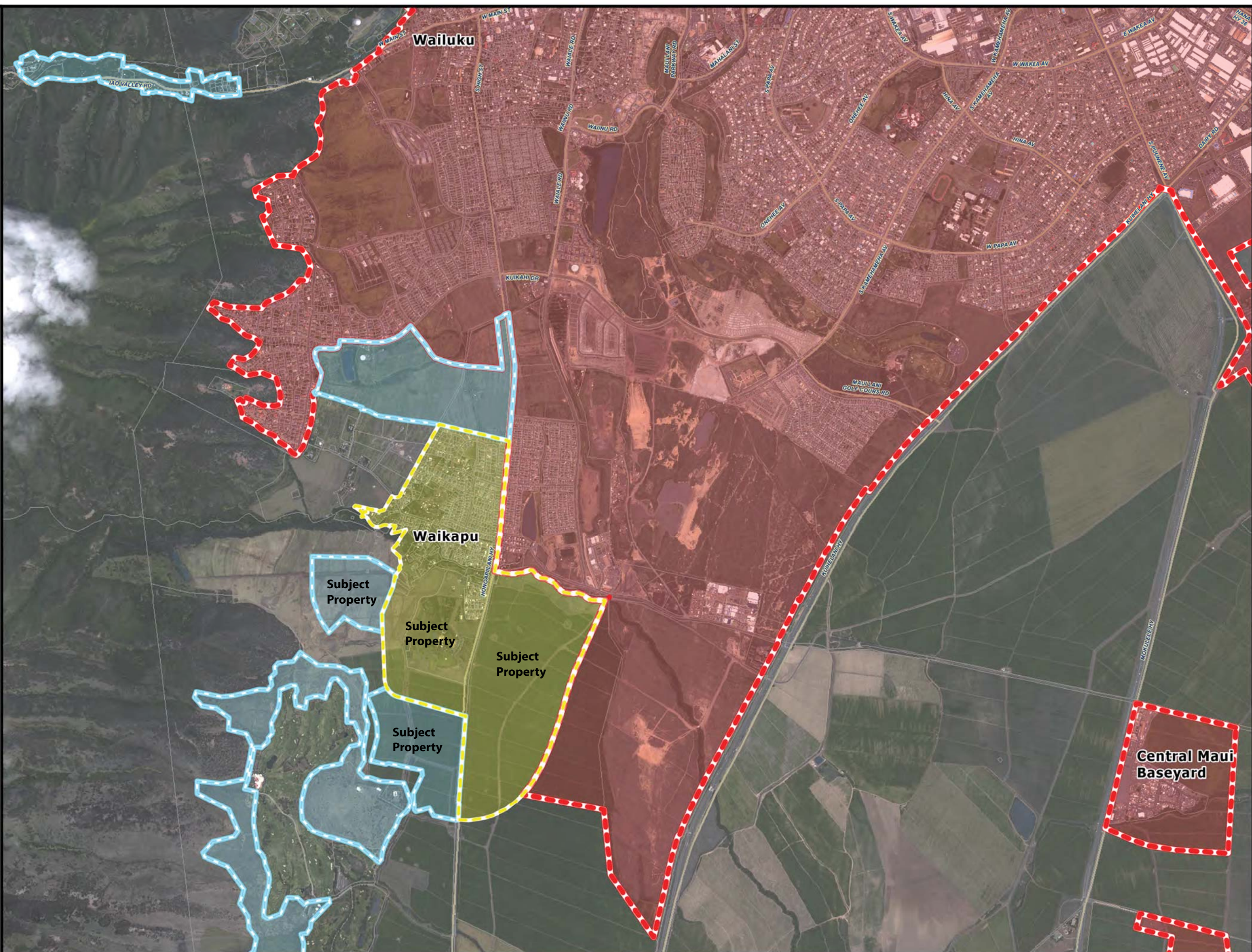
The MIP describes the purpose and intent of the Waikapu Country Town "Planned Growth Area" as follows:

The Waikapu Tropical Plantation Town planned growth area is situated in the vicinity of the Maui Tropical Plantation, and includes lands on both the mauka and makai sides of Honoapi'ilani Highway. Providing the urban character of a traditional small town, this area will have a mix of single-family and



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multifamily rural residences, park land, open space, commercial uses, and an elementary or intermediate school developed in coordination with the Wai'ale



Maui Island Plan Directed Growth Map

Waikapu / Kahului
C3

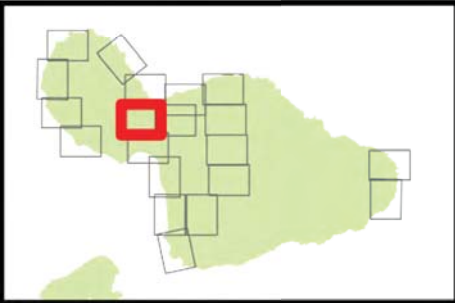
Legend

Growth Boundaries

- Urban
- Small Town
- Rural

Reference

- 2011 Parcels
- Primary Roads



Product Code: M-CET_20121210-D2
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Background Image: Worldview 2 - 2010
This is not a zoning map. Please contact the Planning Department for Zoning confirmation.

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project. The area is located south of Waikapu along Honoapi'ilani Highway, and it will incorporate the integrated agricultural and commercial uses of the existing tropical plantation complex. This area is proximate to the Wai'ale planned growth area, providing additional housing in central Maui within the Wailuku-Kahului Community plan region. As part of this project, parcels to the south of the project (identified as Agricultural Preserve on Figure 8-1) shall be protected in perpetuity for agricultural use through a conservation easement. A portion of this area may be dedicated to the County as an agricultural park administered pursuant to County regulations. Alternatively, this area can be developed as a private agricultural park available to Maui farmers, and executed through a unilateral agreement between the landowner and Maui County. The rural lots mauka of Honoapi'ilani Highway are intended to be developed using a CSD plan. The CSD plan shall provide access to uninterrupted walking and bicycling trails and will preserve mauka and makai views while protecting environmentally sensitive lands both along Waikapu stream and mauka of the subdivision.

Planned Growth Area Rationale:

Keeping the Waikapu Tropical Plantation as its town core, this area will become a self-sufficient small town with a mix of single-family and multifamily housing units in a walkable community that includes affordable housing in close proximity to Wailuku's employment centers. Schools, parks, police and fire facilities, transit infrastructure, wastewater, water supply resources, and other infrastructure should be developed efficiently, in coordination with neighboring developments including Maui Lani, Kehalani, Pu'unani and Wai'ale. The Waikapu Tropical Plantation Town planned growth area is located on Directed Growth Map #C3 .^{vii}

B. THE WAIKAPU COUNTRY TOWN MASTER PLAN

The proposed Waikapu Country Town (WCT) is situated in Central Maui, just south of the small plantation community of Waikapu, at the Maui Tropical Plantation (MTP). The property is identified as TMK Nos. (2) 3-6-5:007; 3-6-002:001 and 003; 3-6-004:003 and 006; and 3-6-

006:036 (See: Figure Nos. 2, 3, and 4a-d, (“Regional Location Map”, “Aerial Location Map”, and “TMK Maps”). The project area encompasses approximately 59 acres of State Urban District lands and 1,517 acres of State Agricultural District lands (See: Figure No. 5, “State Land Use Designation”). The existing MTP retail shops, restaurant, convention hall, tropical gardens and lagoon are on the urban designated lands (TMK No. (2) 3-6-005:007). Approximately 443 acres are proposed to be re-designated from the State Agricultural District to the State Urban and Rural Districts.

WCT will be a “complete community,” encompassing a mixture of single- and multi-family residential units, commercial, and civic uses. In accordance with the MIP, WCT includes 1,433 residential units together with neighborhood retail, commercial, a school, parks and open space. The town will be bound by agricultural lands that will be preserved in perpetuity through a conservation easement. The utilization of conservation subdivision design (CSD) practices will preserve additional rural lands for farming, open space, and open land recreation.

WCT will be built both mauka and makai of Honoapiilani Highway. Development mauka of the highway will focus inward onto a “village center,” incorporating the existing buildings and grounds of the MTP. The Master Plan calls for a diverse mixture of affordable and market priced housing, along with commercial, entertainment, and civic uses within and around the village center.

Development makai of the highway will focus onto a pedestrian-oriented “main street,” a nearby elementary school, and parks. The makai development is bound to the east by the planned extension of the Waiale Road, which will intersect with Honoapiilani Highway. A primary objective of the project is to develop a community where walking and biking are the preferred modes of transportation and recreation for short commutes. Therefore, in addition to proposing mixed-use and more compact development patterns, approximately eight miles of

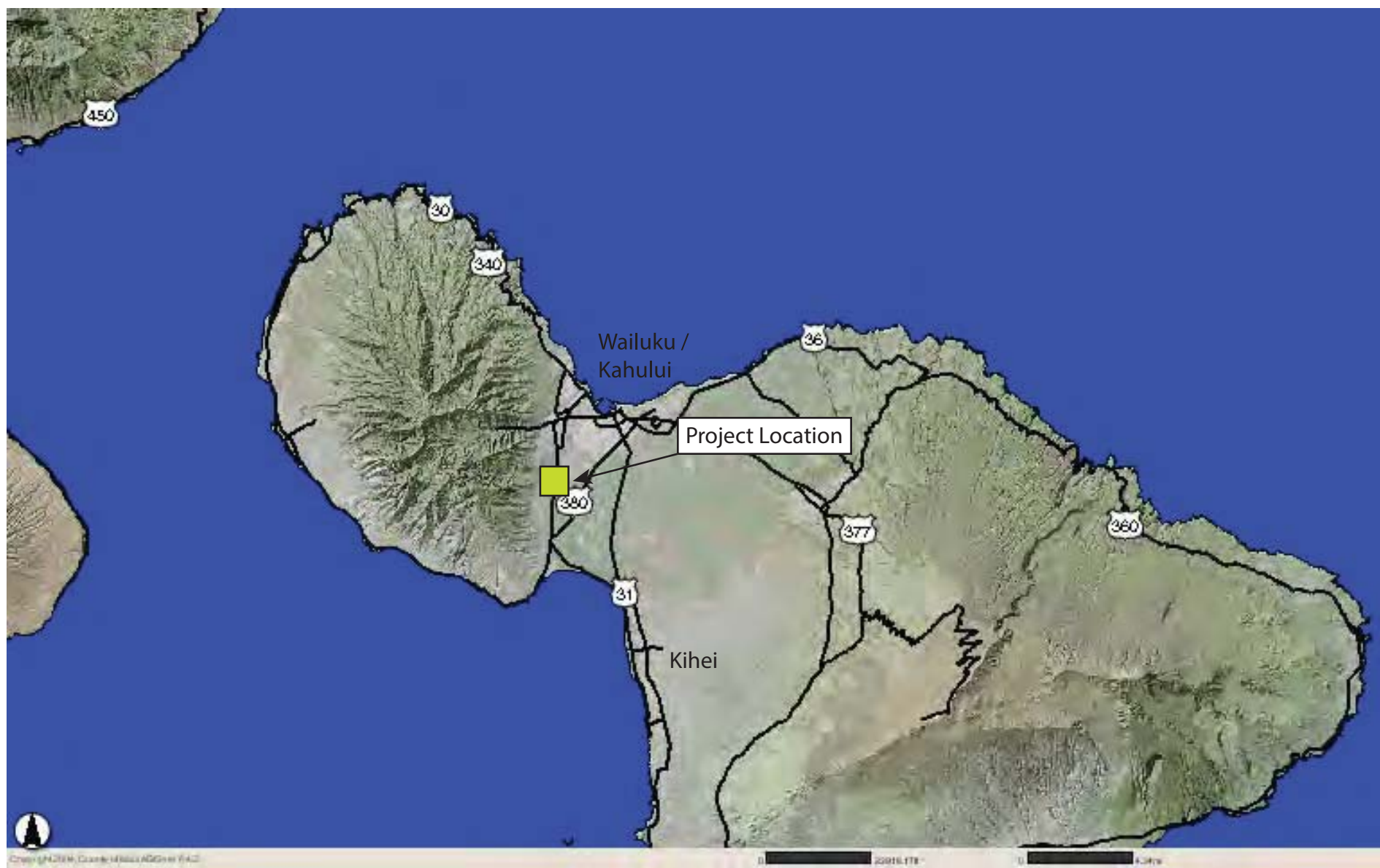


Figure 2
Regional Location

Not to Scale

WAIKAPU COUNTRY TOWN



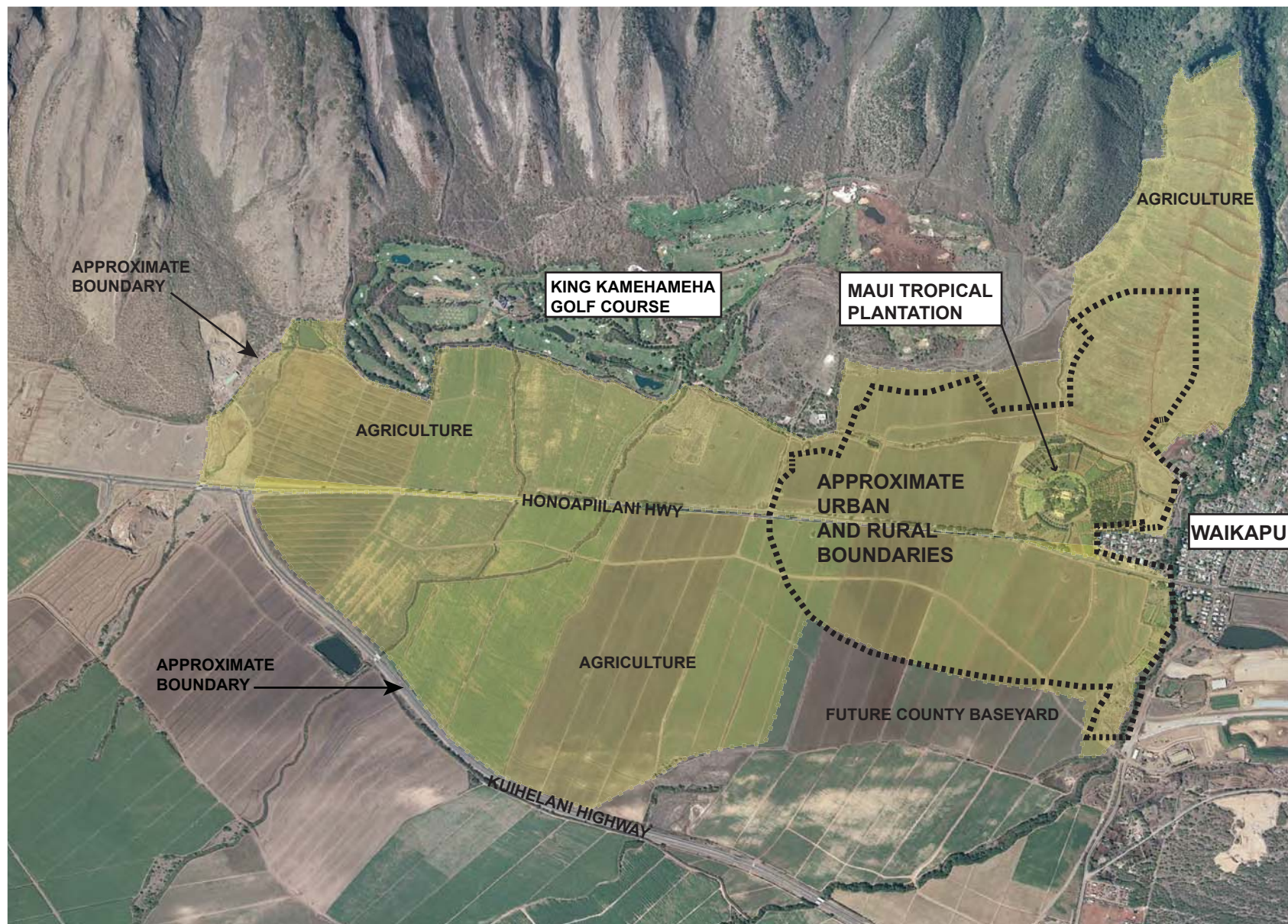


FIGURE 3

AERIAL LOCATION

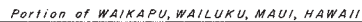


Not to Scale

WAIKAPU COUNTRY TOWN



PLANNING
CONSULTANTS
HAWAII, LLC



PLANNING
CONSULTANTS
HAWAII, LLC

TMK No. (2) 3-6-002:003 and 001

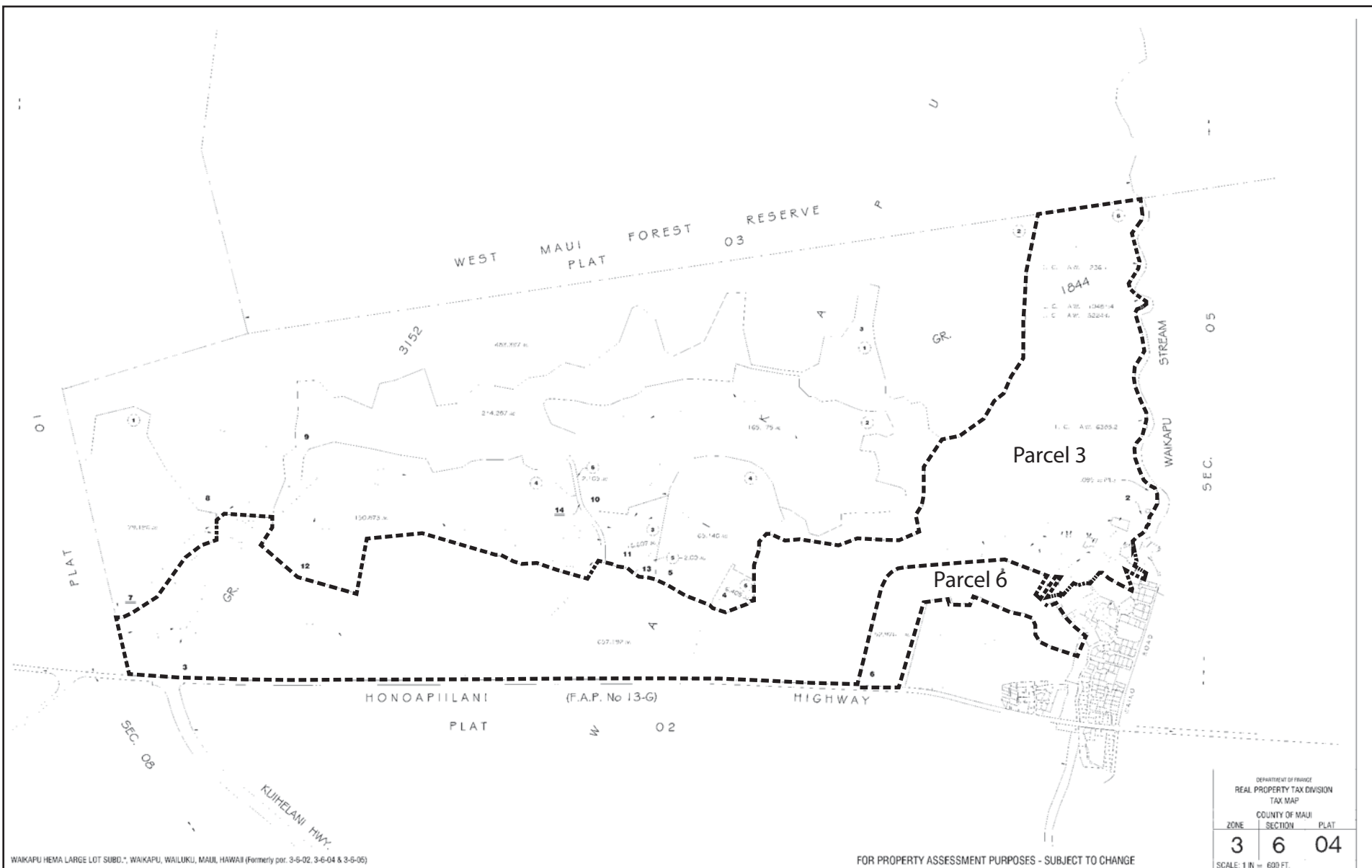


Figure 4c

TMK MAP

TMK Nos. (2) 3-6-004: 003 and 006

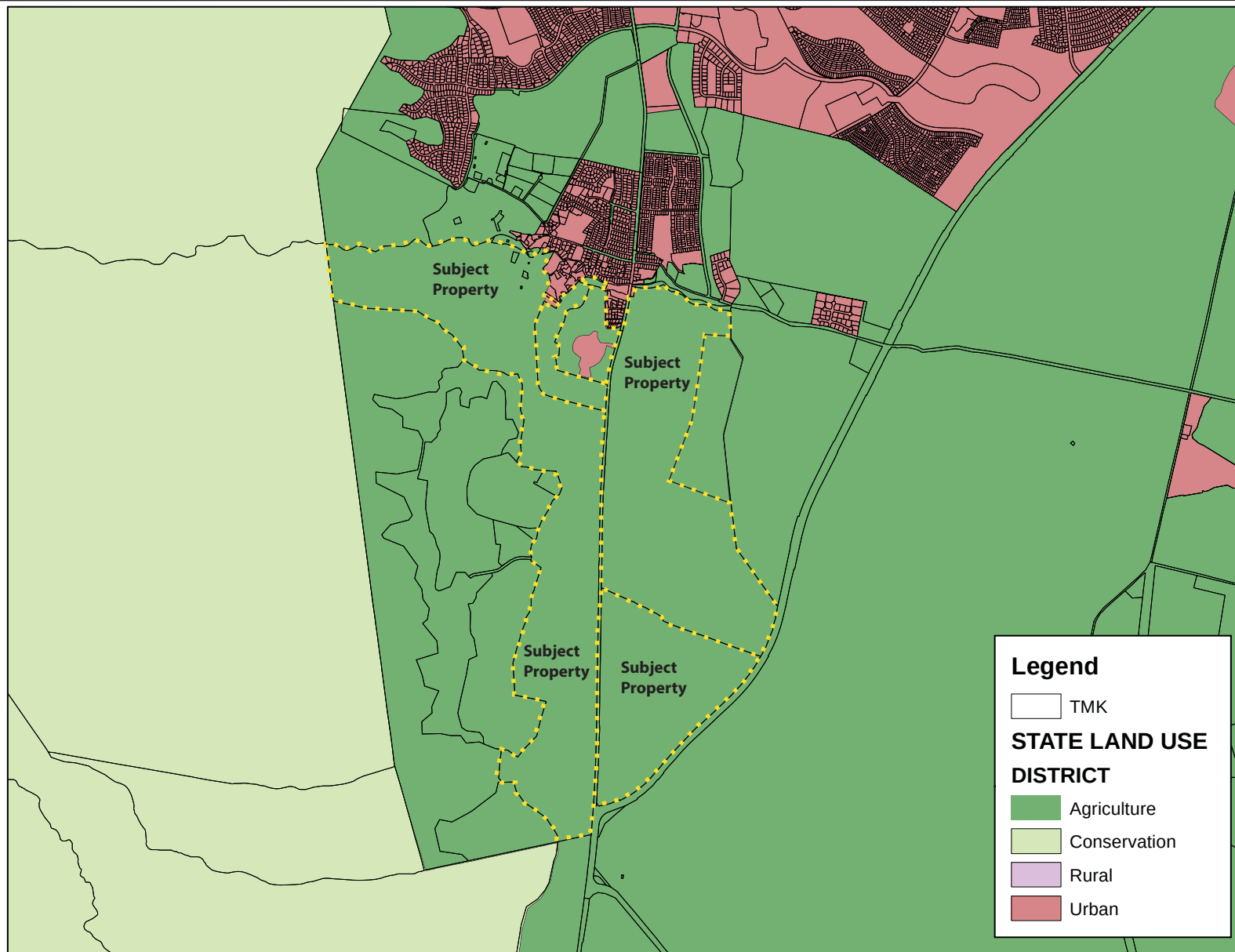


Not to Scale

WAIKAPU COUNTRY TOWN



**PLANNING
CONSULTANTS
HAWAII, LLC**



Legend

TMK
STATE LAND USE DISTRICT
 Agriculture
 Conservation
 Rural
 Urban

FIGURE 5
STATE LAND USE
DISTRICT BOUNDARIES



Not to Scale

WAIKAPU COUNTRY TOWN



PLANNING
CONSULTANTS
HAWAII, LLC

hiking, biking and walking trails will be incorporated into the project. Public transit will also be accommodated in strategic locations to facilitate the use of transit to jobs-rich areas in Wailuku/Kahului and South and West Maui (See: Figure 6: “Conceptual Land Plan”).

C. PURPOSE AND SCOPE OF THE AGRICULTURAL IMPACT ASSESSMENT

The property owner, Waikapu Properties, LLC, has contracted with a professional consultant team to prepare a consolidated Hawaii Revised Statutes (HRS) Chapter 343 Environmental Impact Statement (EIS), State Land Use Commission District Boundary Amendment, Community Plan Amendment and Change in Zoning Application.

The Agricultural Impact Assessment (AIA) will assess the long-term impact of the project on the state’s agricultural industry.

The scope of the study includes the following tasks:

- Assessment of the current status of Hawaii agriculture. This will include an overview of the agricultural industry’s significance to Hawaii’s economy, its current economic standing, its market penetration, and challenges and opportunities.
- Assessment of the current availability of agricultural resources. This will include an assessment of the availability of agricultural lands state-wide and on Maui, current agricultural land use within Maui County, availability of State and County Agricultural Park lots, and agricultural lands proposed for development on Maui.
- Analysis of existing agronomic conditions within the project site. This will include documentation of the following factors: 1) soil types, 2) soil ratings, 3) slopes, 4) solar radiation, 5) rainfall, 6) and existing irrigation systems.
- Description of the recent agricultural history of the property. This will include a description of the past and current operators, including HC&S, Kumu Farms, Maui Tropical Plantation (MTP), Hawaii Taro LLC, and ranching.
- Assessment of the impact of the project on current agricultural operations. This will include an assessment of the project’s impact on the ongoing operations of HC&S, Kumu

Waikapu

COUNTRY TOWN

AGRICULTURE
PRESERVE

AGRICULTURAL
PARK

AGRICULTURE

AGRICULTURE
PRESERVE

LEGEND

- RURAL LOTS
- SINGLE FAMILY
- COTTAGE TOWN HOME
- COUNTRY TOWN MIXED USE
- COMMERCIAL
- PARKS AND OPEN SPACE
- SCHOOL

COUNTY OF MAUI
100 AC.

LAND USE PLAN



DATE: JULY 18, 2013

Farms, Hawaii Taro LLC and other enterprises actively engaged in farming on the property.

- Analysis of the Project's consistency with State and County Agricultural Policies. This section will identify and discuss the project's consistency with State and County agricultural land use policy.

III. HAWAII'S AGRICULTURAL INDUSTRY

A. ECONOMIC SIGNIFICANCE TO THE ECONOMY

Agriculture has played a major role in Hawaii's socio-economic development for over 150 years. Hawaii's modern culture, ethnic composition, land use patterns, urban design, and landscapes are all shaped by Hawaii's agricultural history.

However, while agriculture, predominantly sugar and pineapple, dominated Hawaii's economy from the late 1800s through the 1950s, its overall significance has declined dramatically since the advent of mass market tourism. At its peak in 1927, the sugar industry employed 56,600 workers. Shortly thereafter, in 1932, land utilized for sugar peaked at 254,600 acres. By 1957, however, the sugar industry employed just 16,800 workers, a decline of 70% since 1927. Despite its dramatic decline, sugar was still a major contributor to Hawaii's economy in 1957. In that year the leading income generators in Hawaii included these sources:

- Military expenditures at \$308 million;
- Sugar at \$146 million;
- Pineapple at \$110 million; and
- Tourism at \$80 million.^{viii}

By 2011, the fortunes of Hawaii agriculture, relative to the total economy, had fallen precipitously. In 2011, the entire agricultural sector in Hawaii employed 6,900 workers, providing 1.15% of wage and salary jobs. Moreover, its share of the gross domestic product (GDP) for all private industries was 0.89%, and, if Federal, State and County government is included, agriculture represented 0.68% of the State's GDP in 2011.^{ix}

Likewise, in Maui County, the economic significance of agriculture has fallen. In 2011, agriculture employed 1,600 Maui County workers, which represents 2.4% of the 67,200 wage and salary jobs in the County. In terms of County earnings, in 2008, agriculture generated \$98.55 million as compared to total non-farm earnings of approximately \$3.6 billion.^x

While agriculture is no longer a dominant industry in Hawaii, it is still important because it creates jobs and facilitates economic diversification. In addition to the 6,900 people that are directly employed by agriculture, the industry creates indirect and induced employment in other sectors of the economy. Using the State of Hawaii's input-output model, it can be estimated that in addition to direct employment, approximately 1,636 indirect jobs were created by agriculture and another 1,695 induced jobs were created by the industry in 2011.^{xi}

According to the Maui Agricultural Development Plan (July, 2009), the agricultural industry is important for the following reasons:^{xii}

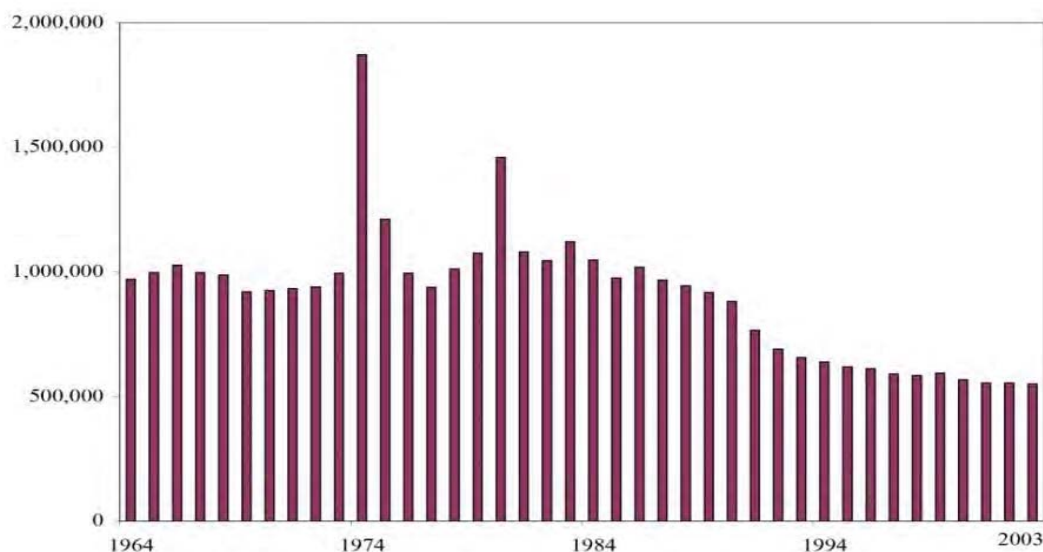
- Agriculture creates jobs;
- Locally grown foods are fresher and of higher quality;
- Locally grown food increases food security;
- Local agriculture provides for Maui's biosecurity;
- Agriculture preserves open space and working agricultural viewsapes; and
- Agriculture contributes to groundwater recharge.

It is because of these reasons that, despite the declining role of agriculture in Hawaii's economy, the State and County maintain strong policies to protect the State's agricultural resources.

B. MARKET COMPOSITION

As noted, agriculture is a far smaller component of Hawaii's economy than it was historically. As Figure 7 shows, the value of agricultural production decreased significantly between 1964 and 2003. The decrease is largely attributed to the closure of sugar plantations throughout the State.

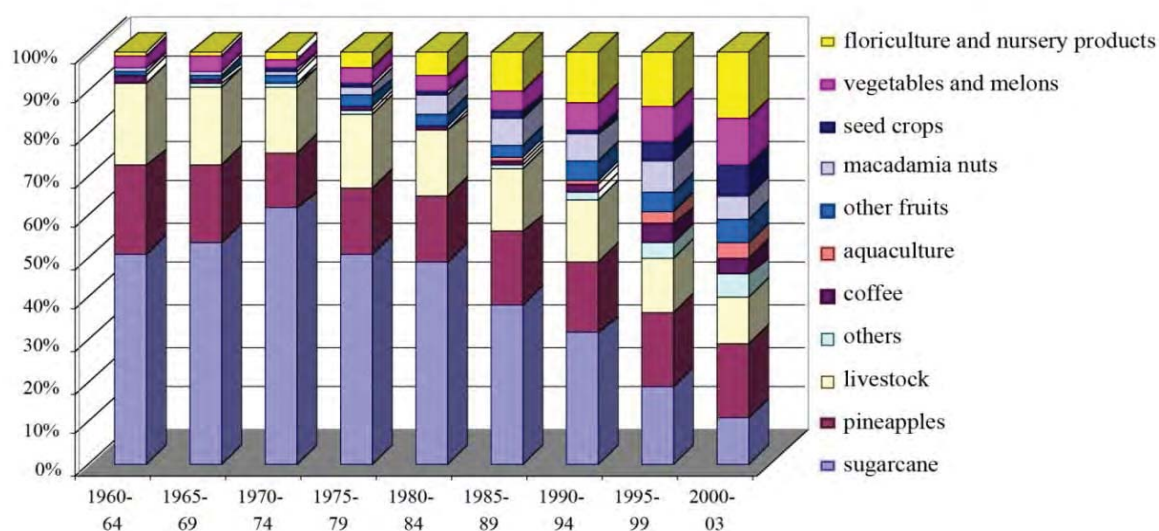
Figure 7: Value of Hawaii's Agricultural Production between 1964 and 2003



Since the mid 1980s, the economic benefits of agricultural production have been in steady decline.^{xiii}

However, since 2003 the market value of crop and livestock sales has increased by 27%, from \$520.47 million in 2003 to \$659.66 million in 2010.^{xiv} The increase is largely attributed to the dramatic growth in seed crop sales.

Figure 8: Relative Value of Hawaii's Major Agricultural Crops from 1960 to 2003

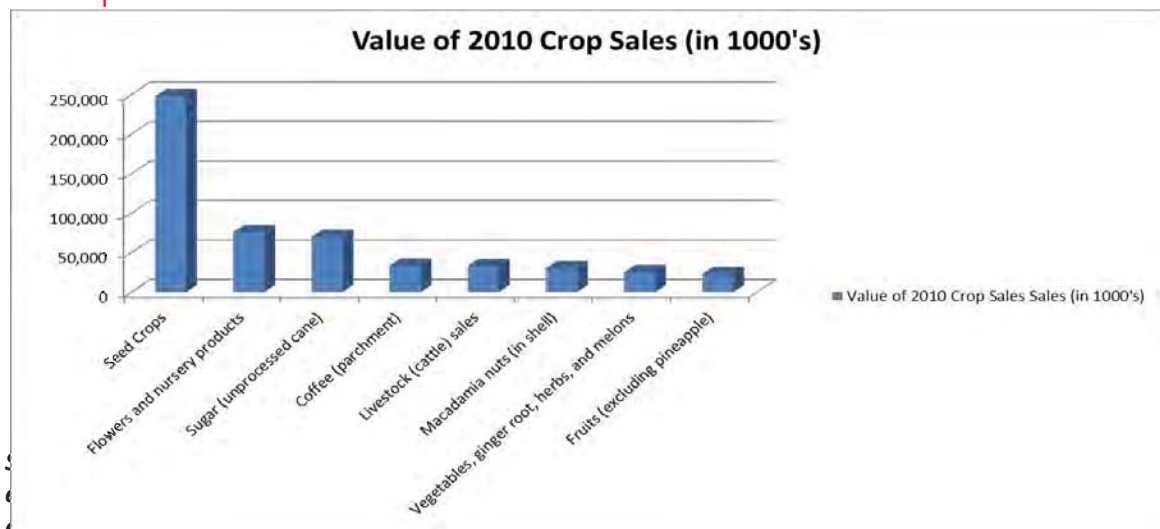


Agricultural Crop diversification was significant in the years between 1960 and 2003.^{xv}

Figure 8 shows the diversification of Hawaii's agricultural industry from one dominated by sugar, pineapple and livestock sales during the 1960s to a significantly more balanced and diversified portfolio in 2003. However, as Figure 9^{xvi} shows, the explosive growth of the seed crop industry has led to an industry whose value, as measured by sales, is once again dominated by a single crop.

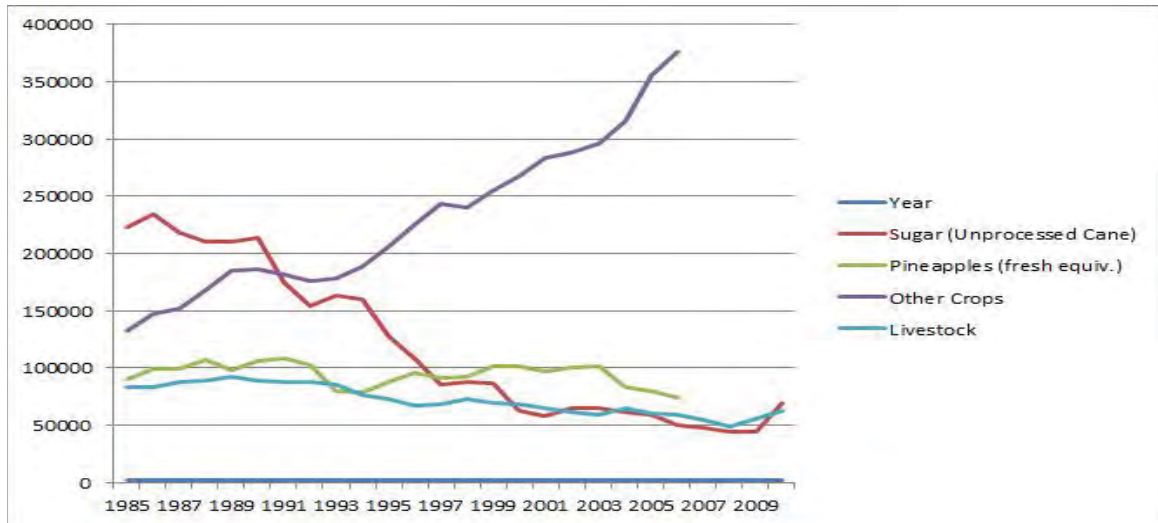
Figures 10 and 11 show the tremendous growth of Hawaii's seed crop industry and equally dramatic contraction of the sugar industry between 1985 and 2010. During this period, sales of Hawaii coffee, vegetables and melons, macadamia nuts and taro have been relatively flat.^{xvii}

Figure 9: Value of 2010 Crop Sales (in thousands)



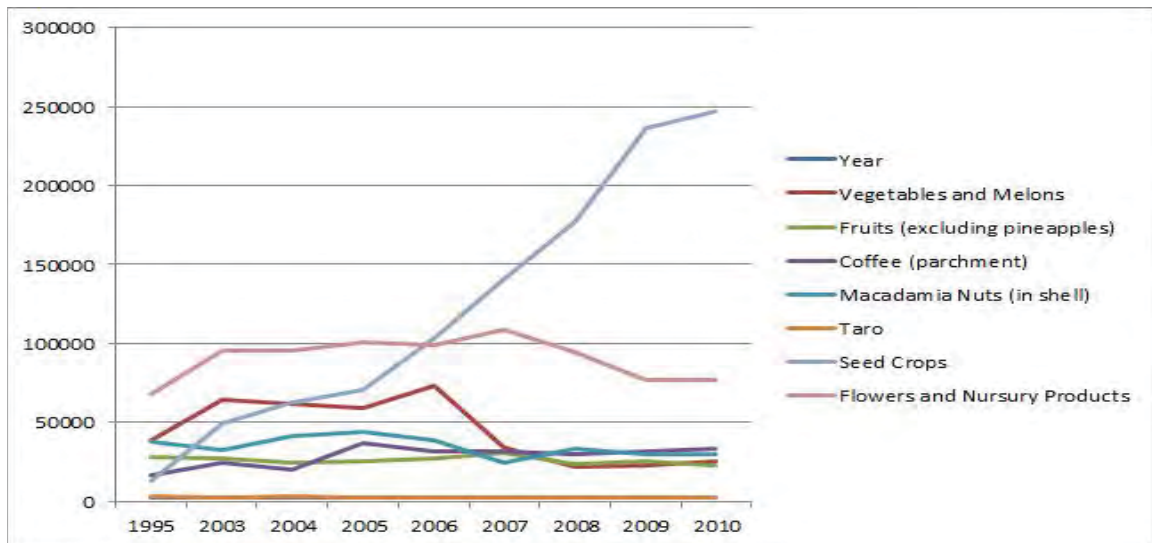
Seed crop sales far out performed other commodities in 2010.

Figure 10: Value of Hawaii's Major Crops between 1985 and 2010 (in thousands)



While seed crop sales increased dramatically between 1985 and 2010, sugar sales steadily declined.

Figure 11: Value of Hawaii's Crop Sales between 1995 and 2010 (in thousands)¹



Hawaii enjoyed varied crop sales in several different commodities, with seed crops the clear high performer.

¹ Beginning in 2007 non-published vegetable commodities were not included to avoid disclosure of individual operations. This change produces the sharp decline in vegetable and melon sales as shown in the graph.

C. MARKET SHARE

1. Hawaii Market

It has been well documented that Hawaii farmers face intense competition from U.S. Mainland and International food suppliers for Hawaii market sales. In a 2008 study by the University of Hawaii, College of Tropical Agriculture and Human Resources (UH-CTAHR),^{xviii} it was documented that Hawaii food consumption expenditures grew from \$2.6 billion in 1995 to \$3.7 billion in 2005, increasing at a rate of 3.4% annually. Of the food consumed in Hawaii, it further notes that approximately 85% is imported.

For local market sales, one would expect that Hawaii farmers would have a comparative advantage because of lower shipping costs and the ability to deliver fresher product. However, as documented by UH-CTAHR's study, in 2005 off-shore suppliers dominated the local market for fresh fruits and vegetables, beef, pork, chicken, eggs and milk, as is shown in Table 1:

Table 1: 2005 Market Share for Hawaii Agricultural Products

Agricultural Product	% of Hawaii market held by off-shore suppliers	% of Hawaii market held by Hawaii suppliers
Beef	95.50	4.50
Pork	96.10	3.90
Eggs	80.00	20.00
Fresh Milk	90.00	10.00
Fresh Fruits	65.22	34.78
Fresh Vegetables	66.50	33.50

Off-shore suppliers greatly exceeded Hawaiian suppliers for all products in 2005

According to the study, Hawaii farmers only increased market share in the fresh vegetable market. The UH-CTAHR study notes that the rate of growth in the production of fresh vegetables in Hawaii outpaced consumption at an annual rate of 5.8% to 4.3%,

which means Hawaii is becoming more self-sufficient in vegetables. In beef, Hawaii production and consumption remained stable at an annual growth rate of 4.4%. In fresh fruits, fresh milk, eggs and pork, annual production has decreased and Hawaii has become less self-sufficient.

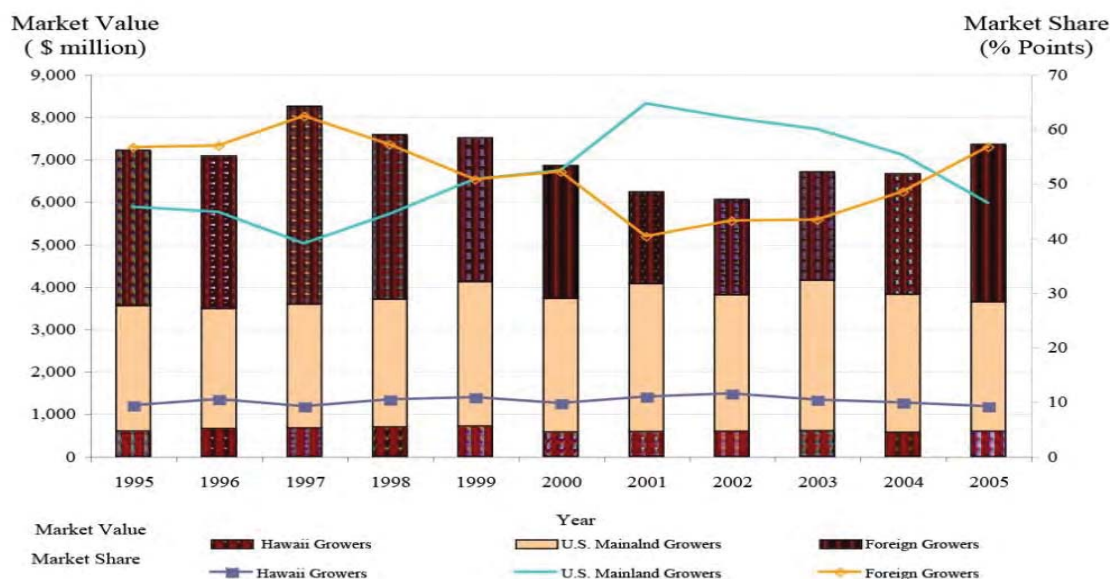
2. Mainland Market

In 2005, UH-CTAHR conducted an analysis of Hawaii's comparative advantage in the US Mainland market for the following eleven export crops:

1. Fresh papaya;
2. Fresh pineapples;
3. Processed pineapples;
4. Coffee;
5. Seed corn;
6. Dendrobium (spray)
7. Cut and potted foliage;
8. Raw sugar (cane);
9. Macadamia nuts;
10. Fresh cut anthuriums; and
11. Potted orchids.

In this study, UH-CTAHR found that Hawaii increased its competitiveness (as measured by market share) in seed corn, coffee and dendrobiums. In five crops – fresh pineapple, processed pine, raw sugar, potted orchids, and foliage – Hawaii became relatively less competitive. In three crops – fresh papayas, macadamia nuts, and anthuriums – Hawaii maintained its comparative advantage.^{xix}

Figure 12: Hawaii Market Share in U.S. Mainland Market for Select Products (in thousands)



Hawaii growers maintained a steady Mainland market share in the 10 years between 1995 and 2005.

Figure 12 above shows the U.S. Mainland market share controlled by Hawaii growers between 1995 and 2005 for the eleven agricultural products. During the period, Hawaii retained a relatively stable share of the aggregate market value of these products.

3. Japanese Market

In 2010, UH-CTAHR conducted an analysis of Hawaii's competitiveness in the Japanese market for twenty agricultural products.^{xx} CTAHR found that between 1995 and 2008 the aggregate average annual value of Hawaii's agricultural exports increased from \$31.46 million (1995-1999) to \$52.82 million (2005-2008). However, the large increase was primarily the result of the tremendous growth in deep sea water sales to Japan. Of the twenty products analyzed, eight are "traditional" crops (i.e., where the fresh product and/or the input into the processed product may be grown by farmers in Hawaii). When analyzing only these eight products, just three, unroasted coffee, roasted coffee and fresh or dried pineapple, increased market share in Japan between 1995 and 2008. The remaining five products, cut flowers/buds, fruits and nuts,

macadamia nuts (fresh or dried), papayas, macadamia nuts (processed), and pineapple (processed) had declining market shares. Table 2 shows the average value of Hawaii exports to Japan in these eight products between 1995 and 2008.

Table 2: Japanese Market Sales between 1995 and 2008 of Select Hawaii Products

Product	Average Value (US\$M)		
	1995-1999	2000-2004	2005-2008
Coffee, unroasted	2.22	2.04	3.13
Cut Flowers/Buds	2.63	1.60	0.67
Fruits and Nuts	0.18	0.22	0.15
Macadamia Nuts, Fresh or Dried	0.27	0.03	0.02
Papayas	12.14	6.47	3.50
Pineapples, Fresh or Dried	0.00	0.68	0.45
Coffee Roasted	0.51	1.08	2.04
Macadamia Nuts, Processed	1.80	1.80	1.01
Pineapples, Processed	1.98	0.92	0.53
TOTAL	21.73	14.84	11.5

As seen, the average annual value of exports to Japan in these eight products decreased from \$21.73 million (1995-1999) to \$11.5 million (2005-2008).

In conclusion, Hawaii farmers face stiff competition in local, national, and international markets for agricultural products. In the local market, off-shore suppliers dominate the market for fresh fruits and vegetables, beef, pork, chicken, eggs and milk. While Hawaii growers have slightly increased their market share of fresh vegetables and maintained their very small share of the beef market, they have lost market share in pork, chicken, eggs and milk.

In the U.S. Mainland market, Hawaii growers have had varying degrees of success but overall have sustained the aggregate value of export sales between 1995 and 2005. In

the Japanese market, exports of “traditional” agricultural crops, such as pineapple, papaya and cut flowers, have experienced a significant decrease in the value of sales between 1995 and 2008.

D. INDUSTRY CHALLENGES AND OPPORTUNITIES

1. Industry Challenges

Some of the more significant impediments to agricultural development in Hawaii are the following economic factors:

- High labor costs;
- High transportation costs;
- High energy costs; and
- High land costs.

In 2012 UH-CTAHR conducted an analysis of the economic performance and cost structure of Hawaii and U.S. Mainland farms for the year 2007.^{xxi} Among the study’s significant findings are the following impacts:

- In 2007, average farm sales for Hawaii farms were less than the average cost of inputs. Each dollar spent on Hawaii farms in 2007 generated only \$0.96 of production, whereas each dollar spent on Mainland farms generated \$1.14.
- The average Hawaii farm had a net loss of \$20 per acre. The average mainland farm had a net profit of \$40 per acre.
- Small- to average-sized farms (\$10,000 to \$1,000,000) in Hawaii performed nearly as well as similarly sized mainland farms. Hawaii farms of that size had an output-input ratio of 1.21 while Mainland farms were 1.22.
- Hawaii’s vegetable and melon sector and nursery/floriculture/greenhouse sector achieved net profits, while all other sectors suffered net losses.

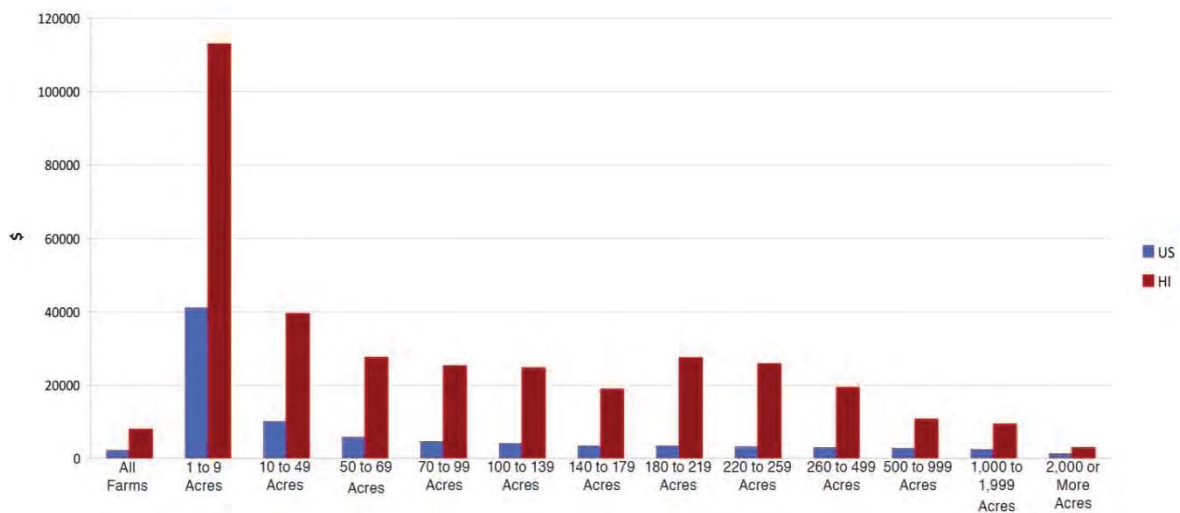
The following are among UH-CTAHR's findings related to cost structure:

- **Labor.** Hawaii labor expenditures were 43% higher than U.S. Mainland farms. For Hawaii farms that hired labor, labor costs equaled about 38% of total sales, while in the U.S. Mainland labor costs were just 9% of sales. Relative to Hawaii's U.S. Mainland market competitors (foreign suppliers), Hawaii has the highest monthly average wage. Compared to its Japanese market competitors, Hawaii has the 3rd highest average monthly wage.
- **Transportation costs.** Relative to its U.S. Mainland foreign market competitors, Hawaii has the highest per mile transportation cost to the U.S. Mainland market. Relative to its major Japanese market competitors, Hawaii farmers have the highest transportation cost.

When shipping to the Honolulu market, however, Hawaii farmers have a significant cost advantage. For Oahu farmers, this cost advantage is considerable as no air or ocean shipping is required. For neighbor island farmers, ocean shipping is relatively affordable, while airfreight is expensive. This fact was documented in a 2010 UH-CTAHR study comparing the cost of shipping between Hilo and Honolulu and Los Angeles and Honolulu. The study found the cost for ocean freight was six times less expensive between Hilo and Honolulu than between Los Angeles and Honolulu. However, the study also found that in 2010 air freight between Hilo and Honolulu was nearly twice as expensive as air freight between Los Angeles and Honolulu. At the time of the study, if the same commodity were to be shipped, it was about 114% more expensive to ship by air between Los Angeles and Honolulu than by ocean freight between Hilo and Honolulu.^{xxii}

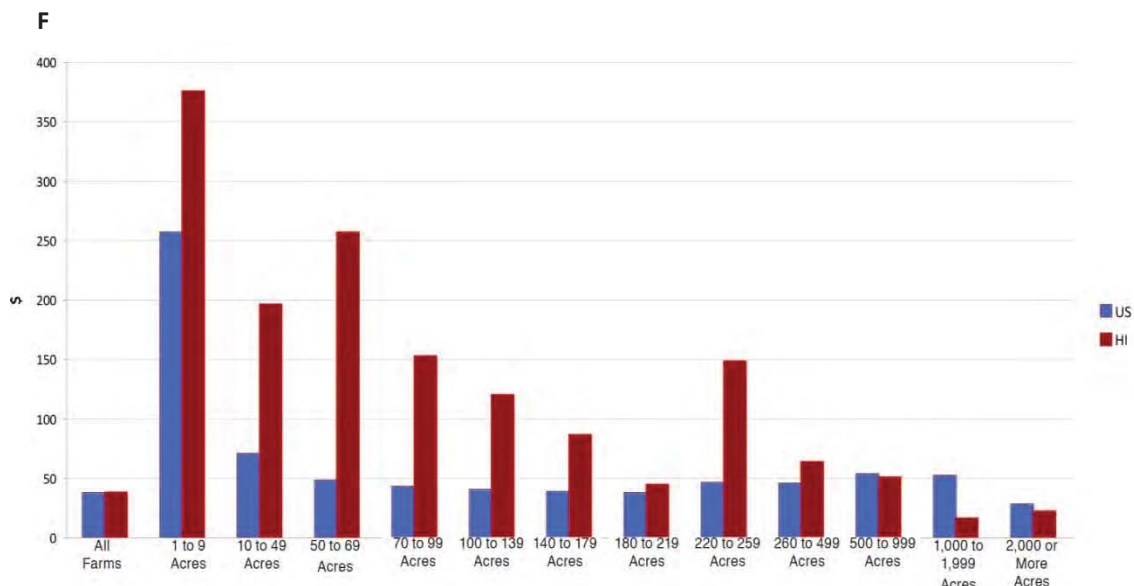
- Energy Costs.** Compared to U.S. Mainland farms, electric/gasoline costs are equivalent to 10% of input costs for Hawaii farmers, whereas they are only 6% for U.S. Mainland farmers. In a comparison of input prices between Hawaii and its major export competitors, it was found that of 52 countries with available data, Hawaii (if assumed to be a separate country) had the 5th highest electricity costs. By comparison, the U.S. Mainland was 39th.^{xxiii}
- Land.** As shown in Figure 13^{xxiv}, the value of an acre of agricultural land in Hawaii is considerably higher than the value of an equivalent acre in the U.S. Mainland. As such, it is not surprising, as shown in Figure 14, that for farms that are less than 500 acres the cost per acre to rent is considerably more expensive in Hawaii than on the U.S. Mainland.

Figure 13: Cost per Acre of Agricultural Land in Hawaii and the U.S. Mainland



The cost per acre of agricultural land in Hawaii greatly increases costs for Hawaii growers.

Figure 14: Cost per Acre to Rent Agricultural Land in Hawaii and the U.S. Mainland



Rent costs reflect the high cost of agricultural land in Hawaii.^{xxv}

2. Industry Opportunities

Although Hawaii farmers face higher input costs than their U.S. Mainland and foreign competition, Hawaii is still a significant supplier of agricultural products. In 2010, the value of all crop and livestock sales in Hawaii was approximately \$660 million,^{xxvi} and despite having relatively high input costs, the seed corn industry has demonstrated that Hawaii agriculture can develop comparative advantage in the right niches.

The following discusses the opportunity for Hawaii agriculture in the following three sectors:

- a. Import Replacement;
- b. Seed Crops; and
- c. Biofuel Crops.

a. Import Replacement

As noted, approximately 85% of food consumed in Hawaii is imported. Table 3 shows Hawaii's consumption and estimated production in 2005 of the following agricultural products: beef, pork, eggs, fresh milk/cream, fresh fruits, and fresh vegetables.^{xxvii}

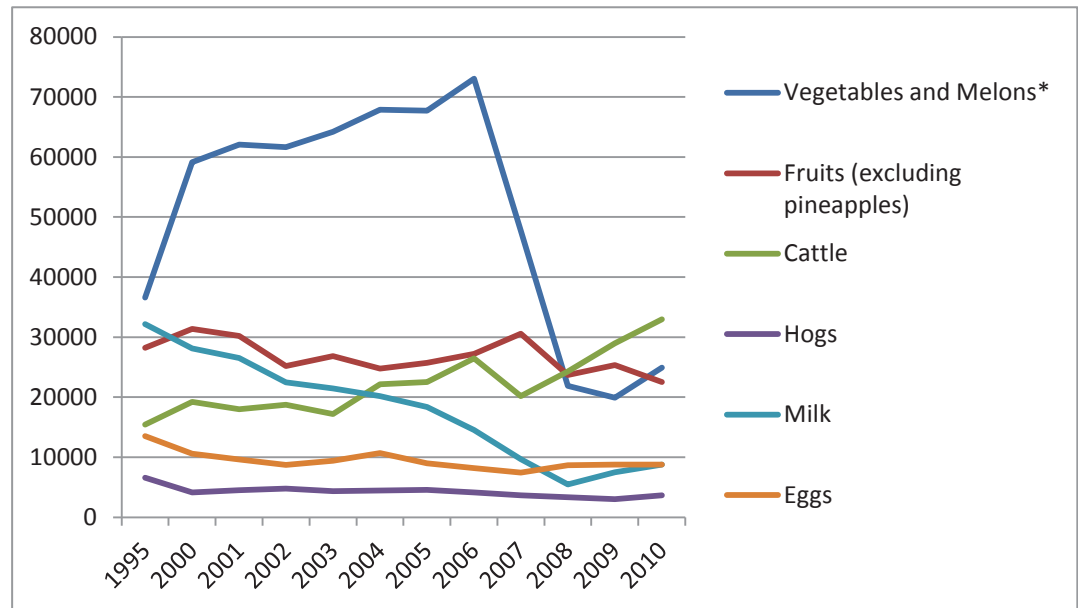
Table 3: Value of Consumption and Production of Select Agricultural Products in Hawaii (in thousands)

Agricultural Product	Total Estimated Consumption	Estimated Hawaii Production	Estimated Hawaii Market Share
Beef	112.80	5.08	4.5
Pork	116.74	4.55	3.9
Eggs	44.90	8.98	20.00
Fresh Milk and Cream	183.87	18.39	10.00
Fresh Fruits	61.54	21.40	34.78
Fresh Vegetables	180.87	60.92	33.50

There is a significant gap between foods consumed in Hawaii and those produced in Hawaii.

As shown, Hawaii has very low market share in the local beef, pork, eggs and fresh milk markets. However, Hawaii's market share in the fruit and vegetable markets is over 30%. Figure 15 shows sales of the above-referenced products between 1995 and 2010.^{xxviii} Despite having the advantage of proximity to the local market and lower shipping costs, Hawaii farmers have been unable to significantly increase the value of their production.

Figure 15: Hawaii Crop Sales between 1995 and 2010 (in thousands)²



Hawaii crop sales remained steady between 1995 and 2010. Vegetable and melon sales were not reported between 2007 and 2010.

In an October 2011 study, UH-CTAHR^{xxix} made six recommendations to help address the higher agricultural input costs faced by Hawaii farmers. These recommendations include the following items:

1. **Labor.** Substitute capital, i.e. machinery and equipment, for labor.
2. **Energy/Electricity.** Develop alternative off-grid sources of electricity, such as solar, wind and hydro, to mitigate high electricity costs.
3. **Fertilizer.** Utilize alternative sources of recyclable waste materials in lieu of imported fertilizers.

² Beginning in 2007 non-published vegetable commodities were not included to avoid disclosure of individual operations. This change produces the sharp decline in vegetable and melon sales as shown in the graph.

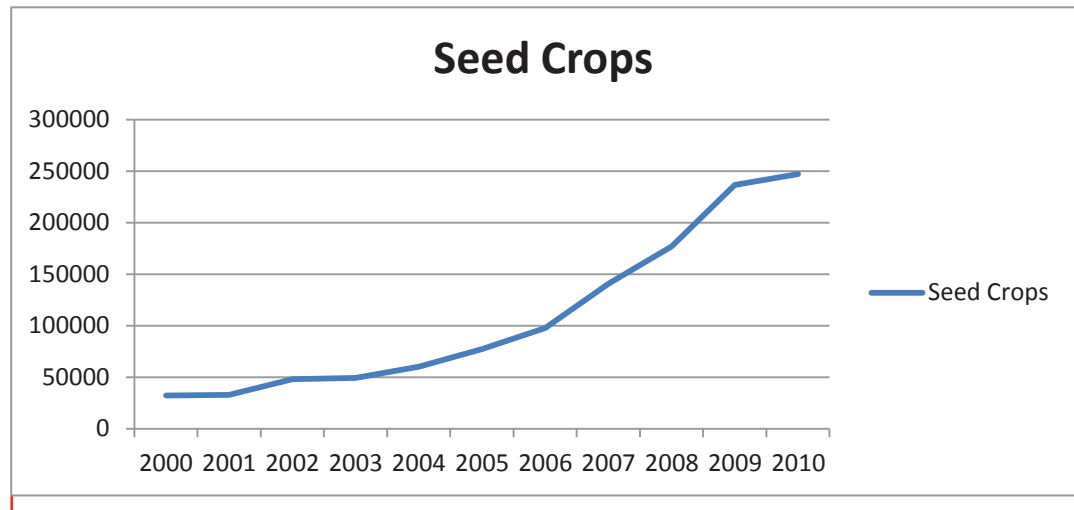
4. **Agricultural Land.** Seek the designation of Important Agricultural Lands (IAL). Place additional acreage in State and County agricultural parks to improve access to affordable farmland and long-term leases.
5. **Transportation Costs.** Encourage the production of crops that can be sold in local markets.

UH-CTAHR also recommends that Hawaii farmers consider shifting production to lower value fruits and vegetables, where a significant percentage of the input costs for these products is transportation costs. They also suggest production of highly perishable and niche products, since quality over price is often a consideration of consumers.

b. Seed Crops

The rapid growth of Hawaii's Seed Crop industry demonstrates that agriculture in Hawaii can be profitable. Hawaii's Seed Crop industry is dominated by 10 farms that cultivate seed corn, soybean, wheat, sunflower, and other seed crops. However, seed corn is the dominant crop and in 2011 represented approximately 95.6% of all seed crop sales.^{xxx} Figure 16 shows the dramatic growth of the industry from 2000 to 2010.

Figure 16: Value of Hawaii's Seed Crop Sales between 2000 and 2010 (in thousands)



The value of seed crop sales increased 700% from 2000 to 2010.

As shown in Figure 16, seed crop sales grew by 700%, from \$35.3 million in 2000 to \$247.22 million in 2010. In 2010, seed crop sales represented 37% of all crop and livestock sales in the state. The next largest contributor was flower and nursery products at 11%, then sugar sales at 10.6%. According to most current accounting, the seed crop industry created 1,397 jobs, which is equivalent to 20.2% of statewide agricultural jobs.^{xxxi}

According to the February, 2013 report prepared for the Hawaii Farm Bureau Federation and the Hawaii Crop Improvement Association entitled “Hawaii’s Seed Crop Industry: Current and Potential Economic and Fiscal Contributions”, the industry is successful in Hawaii for the following reasons:

- Year-round growing conditions allowing up to four crop cycles per year;
- Availability of a highly skilled agricultural workforce;
- Availability of land and water; and
- A stable political and economic environment.

During the 2005-2006 growing season, there were 4,200 acres harvested that produced 8 million pounds of seed. During the 2010-2011 growing season, there were 7,100 acres harvested that produced 9.77 million pounds of seed.^{xxxii} It is expected that the industry will continue to experience growth, but as it matures it is estimated that growth may be at a slower rate than over the past ten years.^{xxxiii}

c. Bio-Fuel Crops.

The State of Hawaii is one of the most oil dependent states in the Country. In 2008, approximately 85% of its energy came from imported petroleum. In comparison, the national average was 35.7%.^{xxxiv} In 2010, the State imported 46.3 million gallons of petroleum at a cost of approximately \$5.09 billion.^{xxxv}

In response to the State's dependency upon imported fossil fuels, it adopted Renewable Portfolio Standards in 2001 and established the Hawaii Clean Energy Initiative (HCEI) goals in 2008. The Renewable Portfolio Standards (RPS) established numeric targets for renewable energy use by Hawaii's electric companies. At present, the RPS standards for renewable energy (wind, solar, biomass, bio-fuels, etc.) have the following target dates:^{xxxvi}

- 10 percent of net electricity sales by December 31, 2010;
- 15 percent of net electricity sales by December 31, 2015;
- 25 percent of net electricity sales by December 31, 2020; and
- 40 percent of net electricity sales by December 31, 2030).

The HCEI, an agreement between the State and HECO, has a goal of increasing renewables total share of energy generation to 40 percent, while reducing overall demand by 30 percent through conservation by 2030.

HCEI envisions that locally produced bio-fuels will be a significant contributor to Hawaii's renewable energy portfolio. HCEI's fuels strategy includes these objectives:^{xxxvii}

- Evaluating local agricultural potential and supporting its development;
- Investing in key logistical infrastructure;
- Evaluating and developing renewable fuel processing infrastructure; and
- Matching potential fuel supply to sources of demand.

In its 2011 strategic plan^{xxxviii}, HCEI noted that large scale production of biofuels was approximately five (5) years away from being commercially viable. There are currently several pilot projects underway in the State. These projects are assessing the viability of various crops and bio-refinery technologies. HCEI has established goals for locally produced renewable fuels for the years 2015, 2020, 2025 and 2030. Its 2015 goals are shown in Table 4 below.

Table 4: HCEI Renewable Fuel Goals for 2015

Source of Demand	Estimated Total Green Replacement Fuel (2015)
The HECO Companies	45 MGY renewable fuel
KIUC	100,000 gal/year
The Department of Defense	TBD MGY renewable JP8 TBD MGY renewable J5 TBD MGY renewable F76 TBD MGY renewable Diesel Fuel/biodiesel
The Ground Transport Sector	Maintain current E10 standard and biodiesel usage

Goals for 2015 reflect efforts across the economic sectors.

Table 5 shows HCEI's renewable fuel goals for 2020. The 2020 goals are predicated on locally produced biofuels being commercially viable and HECO and the Department of Defense implementing plans to accelerate biofuel usage.

Table 5: HCEI Renewable Fuels Goal for 2020

Source of Demand	Estimated Total Green Replacement Fuel (2020)
The HECO Companies	80 MGY renewable generation fuel (based off estimated RPS demand)
KIUC	TBD
The Department of Defense	32 MGY renewable fuels
The Ground Transport Sector	50 MGY of renewable fuels

2020 Renewable Fuels goals show a significant increase over 2015.

In its strategic plan, HCEI states that the “future price of oil will be the deciding factor, as it will materially impact the bottom line for each of the alternative outcomes under consideration”.

HCEI’s goal is to meet in-state demand for fuel with locally produced bio-fuels (approximately 500 MGY) by 2030. If locally produced bio-fuel is not commercially competitive, HCEI’s preferred alternative is to source such fuel from domestic U.S. suppliers and then from foreign suppliers.

Bio-Fuel Viability in Hawaii

The most comprehensive assessment of the viability of bio-fuel production in Hawaii was conducted by Black & Veatch and the University of Hawaii for the State of Hawaii’s Department of Business, Economic Development, and Tourism Strategic Industries Division (DBETD).^{xxxix} The study was completed in January 2010.

The purpose of the study was to assess the potential feedstocks, technologies, and economics of biofuel production in Hawaii to meet the State of Hawaii’s alternative fuel standards, which mandate 10% of transportation fuels from renewable sources by 2010, 15% by 2015, and 20% by 2020. The study addressed several topics, including the following factors:

- Biomass conversion technology options and issues;
- Biomass residue availability;
- Energy crop potential;
- Evaluation of energy crop economics in Hawaii; and
- Emerging and innovative options for biofuel production.

For the purpose of its analysis, the study identified approximately 300,000 acres of prime irrigated land and 800,000 acres of non-prime rainfed land that would be suitable for energy crops. The study concludes that displacing 20% of the gasoline and diesel fuel consumed in Hawaii in 2007 with bio-fuel from locally grown feedstocks would require about 10%, or 110,000 acres, of the lands studied. Therefore, displacing 100% of all gasoline and diesel fuel consumed in Hawaii would require approximately 550,000 acres.

The study estimates that based on projected future prices of retail gasoline and diesel fuels, together with potential cost improvements in alternative fuel production costs, locally produced biofuels would likely not be competitive until at least 2015 when average U.S. gasoline prices reach \$3.50/gallon or more. It should be noted that the average price of a gallon of regular gasoline in the U.S. as of July 11, 2013 was \$3.518/gallon, while the average price in Hawaii was \$4.307.

E. CONCLUSIONS

Hawaii farmers face stiff competition in local, national, and international markets for agricultural products. In the local market, off-shore suppliers dominate the market for fresh fruits and vegetables, beef, pork, chicken, eggs and milk. While Hawaii growers have slightly increased their market share of fresh vegetables and maintained their very small share of the beef market, they have lost market share in pork, chicken, eggs and milk.

In the U.S. Mainland market, Hawaii growers have had varying degrees of success but overall have sustained the aggregate value of export sales between 1995 and 2005. In the Japanese market, exports of “traditional” agricultural crops, such as pineapple, papaya and cut flowers, have experienced a significant decrease in the value of sales between 1995 and 2008.

Significant impediments to agricultural development in Hawaii include high labor costs, high transportation costs, high energy costs and high land costs. Hawaii farms face labor costs that have been documented to be 43% higher than U.S. Mainland farms. Hawaii farmers also have the highest per mile transportation cost to the U.S. Mainland market. However, when shipping to the Honolulu market, Hawaii farmers enjoy a significant cost advantage. The cost of purchasing agricultural land in Hawaii is significantly more expensive than it is in the U.S. Mainland. The cost of renting is also more expensive when the lands being rented are less than 500 acres.

Despite the major challenges that Hawaii farmers face, they are still competitive in many sectors and numerous opportunities are still available. The fact that 85% of food consumed in Hawaii is imported creates opportunities for Hawaii farmers to displace imports, thereby creating jobs and increasing tax revenues in Hawaii. UH-CTAHR recommends that Hawaii farmers consider shifting production to lower value fruits and vegetables, where a significant percentage of the input costs are transportation costs. They also suggest production of highly perishable and niche products, since quality over price is often a consideration of consumers.

Hawaii’s seed crop industry has demonstrated that Hawaii agriculture can have significant comparative advantage in the right sectors. Since 2000, seed crop sales have grown by 700%, from \$35.3 million in 2000 to \$247.22 million, in 2010. According to the industry, Hawaii is successful in this market for the following reasons:

- Year-round growing conditions allowing up to four crop cycles per year;
- Availability of a highly skilled agricultural workforce;
- Availability of land and water; and
- A stable political and economic environment.

Substituting locally grown biofuels for imported petroleum may also provide opportunities for Hawaii farmers over the next several decades. In 2008, approximately 85% of Hawaii's fuel came from imported petroleum. There are many crops, including sugarcane, which can be grown in Hawaii and converted into fuel. The Hawaii Clean Energy Initiative (HCEI) has established aggressive goals for the use of renewable fuels through 2030. One of its primary strategies is to evaluate local agricultural potential for developing bio-fuels. A 2010 study done by Black & Veatch and the University of Hawaii for the State of Hawaii found that displacing 20% of the gasoline and diesel fuel consumed for ground transportation in Hawaii in 2007 with bio-fuel from locally grown feed-stocks would require about 10% of Hawaii's agricultural lands.

IV. STATE AND COUNTY AGRICULTURAL LANDS

A. STATE OF HAWAII

The total land area in the State of Hawaii is 4,112,388 acres, approximately 47% of which, or 1,928,318 acres, is in the State Agricultural District.^{xi} Depending upon the agricultural land rating system used, it is estimated that from 21% to 46% of these lands are very productive for agriculture. Within the State of Hawaii there are four agricultural land rating systems:

1. The Land Capability Classification (LCC) system developed by the United States Department of Agriculture in 1972;
2. The Land Study Bureau's (LSB) Detailed Land Classification system developed between 1965 and 1972 by the University of Hawaii;
3. The Agricultural Lands of Importance to the State of Hawaii (ALISH) rating system developed by the State Department of Agriculture, United States Department of Agriculture, and the University of Hawaii College of Tropical Agriculture and Human Resources between 1977 and 1978;
4. The Land Evaluation and Site Assessment (LESA) system developed between 1983 and 1986 by the LESA Commission.

Hawaii Revised Statutes (HRS) Chapter 205 uses the LSB system to regulate certain uses within the State Agricultural District. Maui County Code, Title 19.30A uses the ALISH rating system as criteria to determine lands that should be given the highest priority for preservation.

The LSB system ranks lands on a scale from "A," which is very good, to "E," which is not suitable. The LSB system also provides crop productivity ratings for pineapple, sugar, vegetables, forage, grazing, orchard crops, and timber. The ALISH system groups land into three classifications: Prime, Unique, and Other. Prime lands are considered to have the best soils with physical, chemical and climatic conditions to favor mechanized field crops. Unique agricultural lands are also considered to be productive for high value crops, such as coffee, taro, and vegetables. Other agricultural lands are not as productive as Prime and Unique lands and may need greater

irrigation and field management to be productive. The following table identifies the approximate acreage of productive agricultural lands in Hawaii using the LSB and ALISH rating systems.^{xli}

Table 6: Hawaii’s Important Agricultural Lands by Rating System

<i>Hawaii’s Important Agricultural Lands by Rating System</i>	<i>Acres</i>	<i>Percentage of State Ag District</i>
University of Hawaii Land Study Bureau (LSB) Lands Lands Rated “A”, “B”, “C”	447,250	24
Agricultural Lands of Importance to the State of Hawaii (ALISH) Prime, Unique, Other	846,363	46

46% of Hawaii agricultural lands are considered Prime, Unique or Other by ALISH.

B. CURRENT AVAILABILITY OF STATE AGRICULTURAL LANDS

As discussed, there are 1.93 million acres within the State Agricultural District. Of these lands, between 21% and 46% are considered very productive. Using the LSB rating system, there are approximately 447,250 acres that are classified “A”, “B”, or “C”. These lands should be considered very suitable for agriculture. Using the ALISH rating system, there are 846,363 acres of “Prime”, “Unique” or “Other” agricultural lands that are suitable for agriculture.^{xlii}

As Table 7 shows, there has been a release of approximately 316,590 acres from crop farming, primarily sugar and pineapple, since 1960. While some of these lands have been absorbed by urban development and other agricultural uses – such as seed crops, forestry crops, macadamia nuts, and floriculture – much of the lands are fallow and are available on Oahu, Maui, Molokai, Lanai and Kauai.^{xliii}

Table 7: Acreage in Crop in Hawaii between 1960 and 2010

Crop	1960	1989	1999	2010	Difference 1960-2010
Sugarcane	287,400	170,800	67,000	34,500	-252,900
Pineapple	96,500	32,700	21,000	1,350 ^{xliv}	-96,500
Vegetables and Melons	3,445	5,000	8,200	2,700	-745
Fruits (Excluding Pineapples)	2,142	7,400	8,100	4,100	1,958
Coffee	6,188	3,000	7,700	8,000	+1,812
Macadamia Nuts	3,515	22,300	19,900	17,000	+13,485
All other crops	NA	4,800	16,200	21,100	+16,300
TOTAL ACRES					-316,590

Coffee, fruits and macadamia nuts have shown an increase in acreage use since 1960.

According to Decision Analysts Hawaii, Inc., “the acreage released from plantation agriculture has far outpaced the demand for land for diversified crops. The net decrease of land in crop amounts to about 229,900 acres. While some of the released land has been converted or is scheduled to be converted to urban uses and tree plantations, an estimated 160,000+ acres remain available for diversified crops.”^{xlv}

C. COUNTY OF MAUI

The County of Maui has approximately 402,354 acres within the State Agricultural District, approximately 244,088 of which, or 61%, are located on Maui).^{xlvi}

Table 8 identifies the approximate acreage of productive agricultural lands on the island of Maui using the LSB and ALISH rating systems:^{xlvii}

Table 8: Hawaii's Important Agricultural Lands by Rating System

<i>Hawaii's Important Agricultural Lands by Rating System</i>	<i>Acres</i>	<i>Percentage of State Ag District Lands on Maui</i>
University of Hawaii Land Study Bureau (LSB) Lands Lands Rated "A", "B", "C"	82,592	34
Agricultural Lands of Importance to the State of Hawaii (ALISH) Prime, Unique, Other	149,242	61

61% of the agricultural lands on Maui are rated Prime, Unique or Other by ALISH.

Table 9 identifies the amount of zoned agricultural acreage on Maui in each of the five LSB classifications, historical use of these lands, ALISH and LESA ratings, and other suitable agricultural uses.^{xlviii}

Table 9: Maui Island's LSB Designated Agricultural Lands

LSB Overall Productivity Rating	Acres	Dominant Historical Crop (s)	Other Historical Crop (s)	Other Ratings ALISH / LESA		Crop Suitability (P, V, S, O, F) ³	Grazing Suitability
A	31,650	Sugarcane	Field Crops	Yes	Yes	Very Suitable Highly	Very Highly Suitable
B	17,378	Sugarcane	Pineapple, Orchards, Field Crops, Animal Husbandry	Yes	Yes	Highly Suitable	Highly Suitable
C	33,554	Pineapple	Sugarcane, Orchards, Field Crops	Yes	Yes	Suitable	Highly Suitable
D	39,029	Animal Husbandry, Field Crops	Pineapple, Sugarcane	Yes; No	Yes; No	Somewhat Suitable	Suitable
E	114,845	Animal Husbandry	Sugarcane	Yes; No	Yes; No	Limited Suitability	Suitable

82,582 Acres, almost 35%, of Maui Island's LSB designated acreage is classified as A, B, or C.

³ Pineapple, Vegetable, Sugarcane, Orchards, and Forestry

D. AVAILABILITY OF AGRICULTURAL LANDS ON MAUI

As discussed, in Maui County there are 402,354 acres within the State Agricultural District and 61% of these lands, or 244,088 acres, are on Maui. Using the LSB rating system, on Maui alone there are approximately 82,592 acres that are classified “A”, “B”, or “C”. These lands should be considered very suitable for agriculture. Using the ALISH rating system, there are 82,592 acres of “Prime”, “Unique” or “Other” agricultural lands on Maui.^{xlix}

As Table 10 shows, there has been a release of approximately 64,150 acres from crop farming, primarily sugar and pineapple, since 1960 within Maui County.ⁱ While some of these lands have been absorbed by urban development and other agricultural uses – such as seed crops, forestry crops, macadamia nuts, and floriculture – much of this land is fallow and is spread throughout the islands of Maui, Molokai, and Lanai.

On the island of Maui, there were three sugar plantations in operation until the 1980s: Wailuku Sugar Company, Pioneer Mill and Hawaiian Commercial & Sugar Company (HC&S). In 1988, Wailuku Sugar Company harvested its last crop of sugar. Of the approximate 4,500 acres it had in sugar in 1979, approximately 1,350 were planted in macadamia nuts, some was urbanized, and much of the remainder was fallow, in sugar or diversified crops. Pioneer Mill had about 6,867 acres in production until 1999, when the last crop was harvested.ⁱⁱ Today, much of the 6,867 acres of former cane land remains fallow but is under pressure for urbanization and the development of two-acre rural/residential lots. In December 2009, Maui Land & Pineapple Company harvested its last pineapple crop. Of the approximate 20,000 acres that were in pineapple production in 1995, only about 1,350 acres are in pineapple production today.ⁱⁱⁱ Of the lands released from pineapple, a small amount has been transitioned to diversified crops and some has been developed as rural/residential lots or is planned for urban use. However, much of this former pineapple land is available for agricultural use in West, East and Upcountry Maui.

Table 10: Acreage in Crop in Maui County between 1987 and 2010

Crop	1960	1987	1997	2010	Difference 1960-2010
Sugarcane	53,700	43,900	43,100	34,500	-19,200
Pineapple	48,900	23,700	9,100	1,350	-47,550
Vegetables and Melons	N/A	2,200	1,400	700	-1,500
Fruits (Excluding Pineapples)	N/A	100	300	600	+500
Coffee	N/A	NA	NA	NA	NA
Macadamia Nuts	N/A	1,300 (wai ag)	NA	NA	Na
All other crops	NA	1,600	1,200	5,200	+3,600
TOTAL ACRES					-64,150

64,150 acres of agricultural land in Maui County has come out of production since 1960.

As discussed, within Maui County a significant amount of land once planted in sugar and pineapple is now fallow. Much of this land is available for diversified agriculture. On the island of Maui, HC&S is still farming over 34,000 acres of sugarcane. Most of the release of agricultural lands over the past two decades has come from the closure of Wailuku Sugar Company and Pioneer Mill and the dramatic reduction in land used for pineapple production. While some of the lands released from sugar and pineapple have been urbanized or are planned for urban development, most of this agricultural land is available for new crops.

1. Agricultural Parks in Maui County

The State Department of Agriculture currently manages 10 agricultural parks in Hawaii. These parks are located on Oahu, Kauai, Hawaii and Molokai. The County of Maui operates Maui's only agricultural park. The purpose of agricultural parks is to facilitate diversified agriculture by offering high quality agricultural lots for long-term lease at affordable rents. According to the State Department of Agriculture's website, of the State's ten agricultural parks, which comprise 3,123 acres and 227 lots, only 2 lots are currently available. These lots are at the Waianae Agricultural Park on Oahu.^{liii}

There are two public Agricultural Parks in Maui County:

- Kula Agricultural Park.

The Kula Agricultural Park comprises 445 acres in Upcountry Maui and is the only agricultural park on Maui. The Park provides farm lots that range from 10 to 30 acres. According to the County's Office of Economic Development, the Park's purpose is to "promote the development of diversified agriculture by providing appropriately sized agricultural lots at reasonable rent with long-term tenure thereby contributing to the economic growth of our agricultural industry".^{liv} There are currently 26 farmers leasing land at the park. However, there are no lots available at the park.

- Molokai Agricultural Park

The State Department of Agriculture manages the only agricultural park on Molokai. The Molokai Agricultural Park comprises 753 acres that are subdivided into 22 lots. According to the State Department of Agriculture website, there are no lots available at the park.

2. Agricultural Lands Proposed for Urban Development in the MIP

In December, 2012, Maui County adopted the Maui Island Plan (MIP)^{lv} to plan for, manage and direct growth through the year 2030. The MIP's housing projections were based on population projections prepared by the State Department of Business Economic Development & Tourism (DBEDT) and a detailed land use forecast prepared by Plan Pacific, Inc. and the Department of Planning's Long-range Planning Division. According to the Land Use Forecast, there is demand for an additional 29,589 housing units through 2030. Of these units, approximately 18,744 are already entitled (i.e. have the appropriate zoning, and 10,845 are not yet entitled).

To accommodate the projected population growth through 2030, the MIP places approximately 7,718⁴ acres of State Agricultural District lands into “Urban” and “Rural” growth boundaries.

3. Impact of the MIP on Agricultural Land Availability

Despite the MIP’s planned long-term urbanization of agricultural lands, there is still a considerable amount of agricultural land that will be available for farming and ranching on Maui. The MIP’s planned urbanization represents just three (3) percent of the agricultural lands on Maui and just 1.9% of all agricultural lands within the County. Moreover, as discussed in the prior section, since 1960 approximately 64,000 acres of productive agricultural lands have been taken out of crop production, mostly from sugar and pineapple. Much of these lands remain fallow or are being used for grazing and other low intensity agricultural uses.

The Maui Agricultural Development Plan (July, 2009), prepared by the Maui County Farm Bureau in association with the County of Maui, Office of Economic Development states in part,

“Since much of Maui’s most productive lands are used for land extensive sugarcane, pineapple⁵, and ranching, and much of what remains has experienced tremendous land value appreciation due to urban encroachment of residential uses, access to affordable long-term tenure is a significant impediment to industry growth.”

“For Maui’s agricultural industry to realize sustained growth, existing farmers wishing to expand their operations and new farmers desiring to

⁴ This includes the 502 acres of WCT lands placed within Urban and Rural growth boundaries

⁵ Since the publication of the Agricultural Development Plan, much of the production of pineapple on Maui has ceased. As noted, of the 9,100 acres of land in pineapple in 1997, just 1,350 acres remain in pineapple.

enter the market must have access to land at a cost and terms that will allow a reasonable opportunity for profitability”.

“Land must also be available with long-term tenure so that high up-front capital costs in new crops, equipment, and infrastructure can be amortized over many growing seasons.”^{lvi}

While there is an abundant supply of currently fallow and productive agricultural land on Maui and within the State of Hawaii, providing long-term and affordable tenure to these lands for small and medium sized farmers impedes agricultural development on Maui. The current shortage of available agricultural park lots is symptomatic of this issue.

E. CONCLUSIONS

There are 1.93 million acres within the State Agricultural District. Since 1960, there has been a release of approximately 316,590 acres from crop farming, primarily sugar and pineapple. While some of these lands have been absorbed by urban development and other agricultural uses – such as seed crops, forestry crops, macadamia nuts, and floriculture – much of the lands are fallow and are available on Oahu, Maui, Molokai, Lanai and Kauai.^{lvii}

The County of Maui has approximately 402,354 acres within the State Agricultural District, approximately 244,088 of which, or 61%, are located on Maui.^{lviii} Using the LSB rating system, on Maui alone there are approximately 82,592 acres that are classified “A”, “B”, or “C”. These lands should be considered very suitable for agriculture. Using the ALISH rating system, there are 82,592 acres of “Prime”, “Unique” or “Other” agricultural lands on Maui.^{lix} Since 1960, here has been a release of approximately 64,150 acres from crop farming, primarily sugar and pineapple, within Maui County.^{lx} While some of these lands have been absorbed by urban development and other

agricultural uses – such as seed crops, forestry crops, macadamia nuts, and floriculture – much of this land is fallow and is spread throughout the islands of Maui, Molokai, and Lanai.

According to the State Department of Agriculture’s website, of the state’s ten agricultural parks, which comprise 3,123 acres and 227 lots, only 2 lots are currently available. These lots are on Oahu. Within Maui County, there are no agricultural lots available at either Molokai Agricultural Park or at the County owned and managed Kula Agricultural Park.

To accommodate the projected population growth through 2030, the MIP places approximately 7,718⁶ acres of State Agricultural District lands into “Urban” and “Rural” growth boundaries. Despite the MIP’s planned long-term urbanization of agricultural lands, there is still a considerable amount of agricultural land that will be available for farming and ranching on Maui. The MIP’s planned urbanization represents just three (3) percent of the agricultural lands on Maui and just 1.9% of all agricultural lands within the County.

While there is an abundant supply of currently fallow and productive agricultural land on Maui and within the State of Hawaii, providing long-term and affordable tenure to these lands for small and medium sized farmers impedes agricultural development on Maui. The current shortage of available agricultural park lots is symptomatic of this issue.

⁶ This includes the 502 acres of WCT lands placed within Urban and Rural growth boundaries

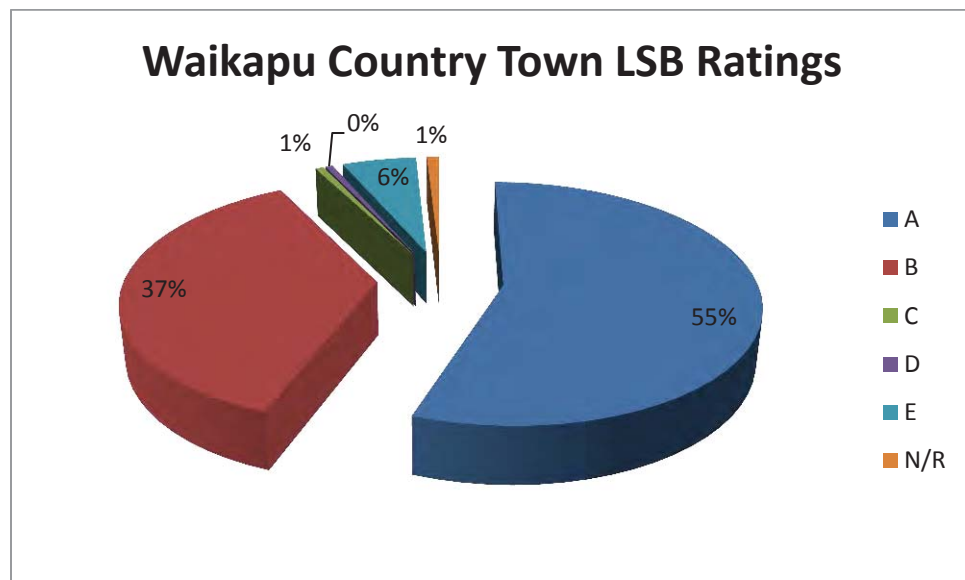
V. AGRICULTURAL IMPACT OF THE PROPOSED PROJECT

A. WAIKAPU COUNTRY TOWN'S EXISTING AGRICULTURAL RESOURCES

1. Land

The Waikapu Country Town comprises approximately 1,675 acres, 50 acres of which are within the State Urban District, and the remaining land is within the State Agricultural District. As Figures 17a-b and 18a-b show, WCT agricultural lands are rated very highly by the LSB and ALISH rating systems. Approximately 92% of WCT agricultural lands, or 1,495 acres, are rated “A” or “B” by the LSB. According to the ALISH rating system, 97%, or 1,576 acres, is “Prime” agricultural land.

Figure 17a: Waikapu Country Town LSB Ratings



Approximately 92% of WCT agricultural lands are rated A or B by LSB.

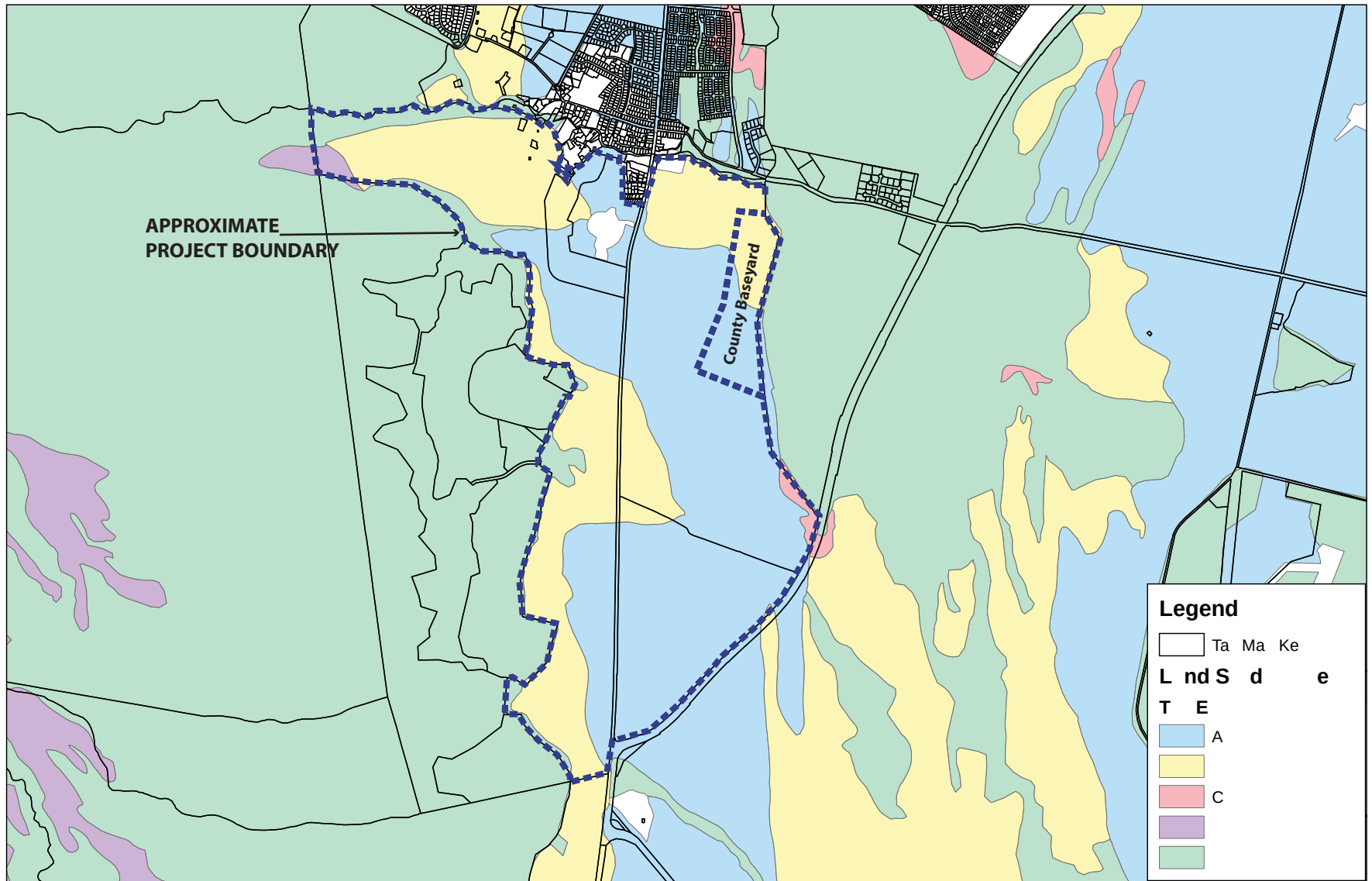


FIGURE 17b

LAND STUDY BUREAU
DETAILED LAND CLASSIFICATION



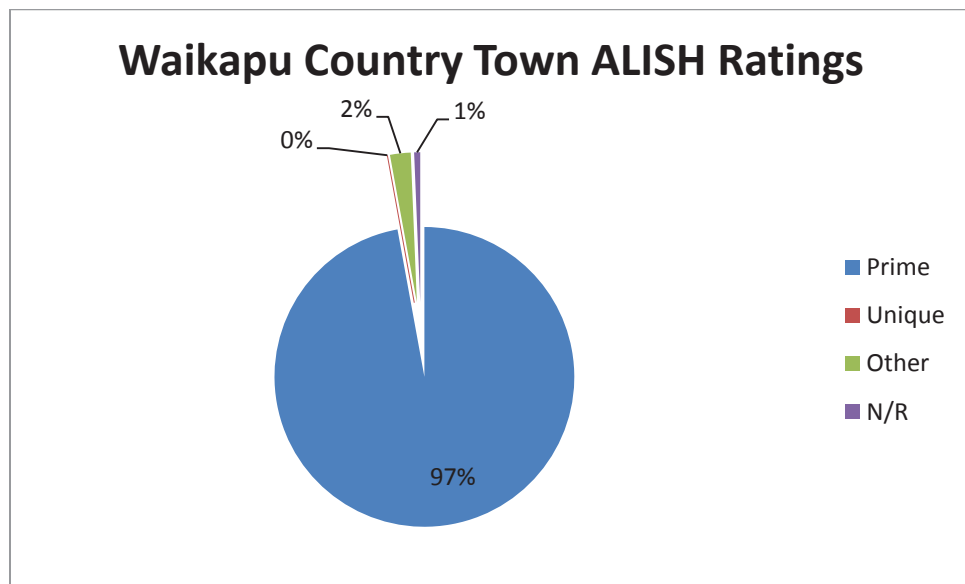
Not to Scale

WAIKAPU COUNTRY TOWN



PLANNING
CONSULTANTS
HAWAII, LLC

Figure 18a: Waikapu Country Town ALISH Ratings



97% of Waikapu Country Town agricultural acres are designated Prime by ALISH.

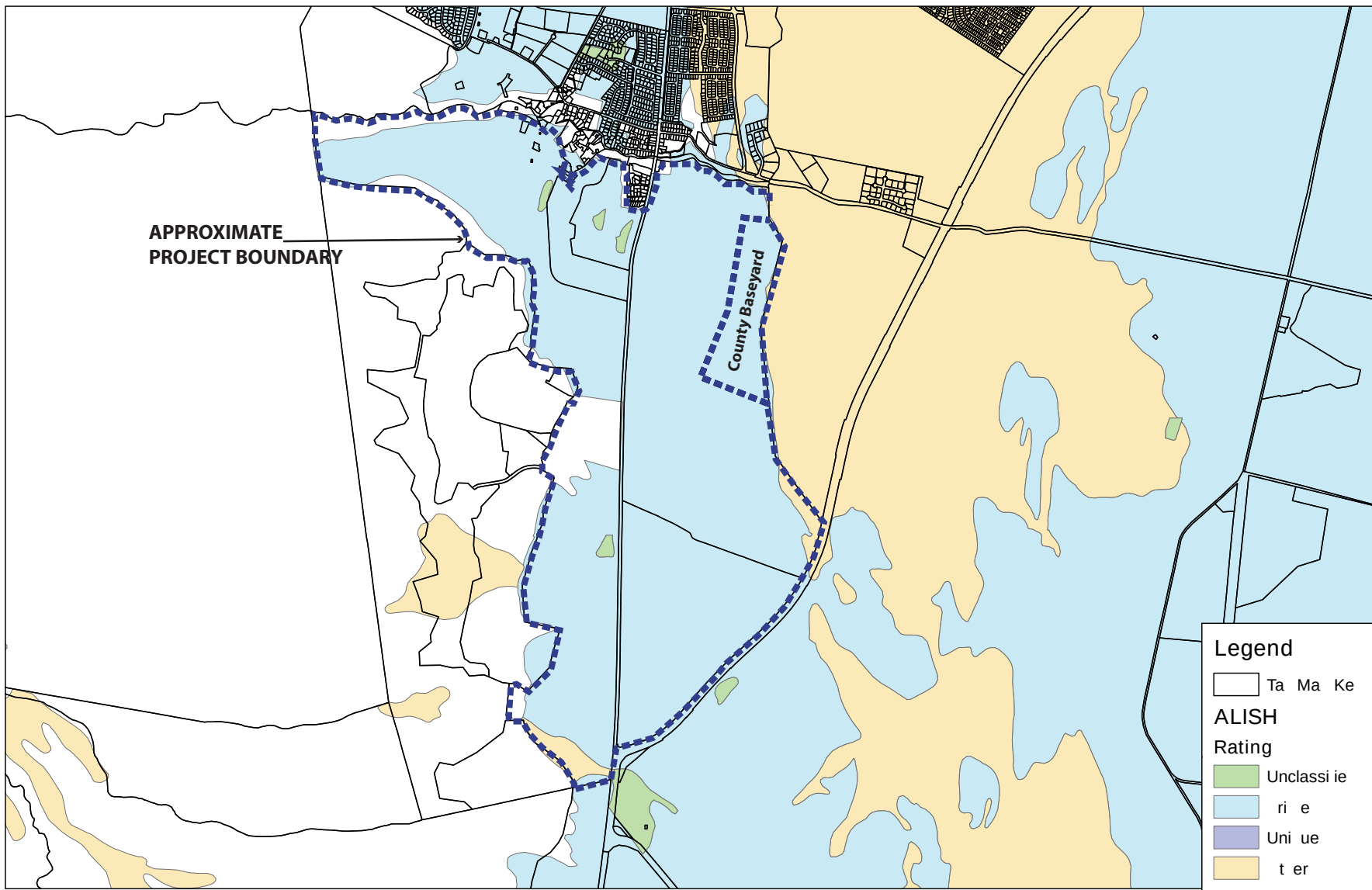


FIGURE 18b

AGRICULTURAL LANDS OF
IMPORTANCE TO THE STATE OF HAWAII



Not to Scale

WAIKAPU COUNTRY TOWN



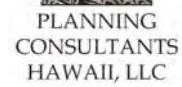
PLANNING
CONSULTANTS
HAWAII, LLC

2. Soil Types

As shown in Figure 19, the project site consists of 11 soil types. Table 11 describes each soil type.^{lxi}

Table 11: Waikapu Country Town Soil Types

Waikapu Country Town Soils Types	
Ewa silty clay, 3 to 7 percent slopes (ESB)	
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 150 feet with slopes that range from 3 to 7 percent. It is a well-drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 18 inches of Silty clay and 18 to 60 inches of Silty clay loam. The available water capacity is moderate at about 7.8 inches.	
lao clay, 3 to 7 percent slopes	
This is considered prime farmland if irrigated. It occurs at elevations of 100 to 500 feet with slopes that range from 3 to 7 percent. It is a well-drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 15 inches of Clay, 15 to 48 inches of Clay, and 48 to 60 inches of Silty clay. The available water capacity is moderate at about 8.4 inches.	
Pulehu silt loam, 0 to 3 percent slopes (PpA)	
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 0 to 3 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Silt loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 8.4 inches.	
Pulehu silt loam, 3 to 7 percent slopes (PpB)	
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 3 to 7 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Silt loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 8.4 inches.	



Pulehu cobbly silt loam, 3 to 7 percent slopes (PrB)
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 3 to 7 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Cobbly silt loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 7.5 inches.
Pulehu clay loam, 0 to 3 percent slopes (PsA)
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 0 to 3 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Clay loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 8.4 inches.
Pulehu cobbly clay loam, 0 to 3 percent slopes (PtA)
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 0 to 3 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Cobbly clay loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 7.5 inches.
Pulehu cobbly clay loam, 3 to 7 percent slopes (PtB)
This is considered prime farmland if irrigated. It occurs at elevations of 0 to 300 feet with slopes that range from 3 to 7 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 21 inches of Cobbly clay loam and 21 to 60 inches of Silty clay loam. The available water capacity is moderate at about 7.5 inches.
Water > 40 acres (W)
Water bodies greater than 40 acres.
Wailuku silty clay, 3 to 7 percent slopes

This is considered prime farmland if irrigated. It occurs at elevations of 50 to 1000 feet with slopes that range from 3 to 7 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 12 inches of Silty clay and 12 to 60 inches of Silty clay. The available water capacity is moderate at about 8.4 inches.

Wailuku silty clay, 7 to 15 percent slopes

This is considered prime farmland if irrigated. It occurs at elevations of 50 to 1000 feet with slopes that range from 7 to 15 percent. It is a well drained soil that is more than 80 inches in depth. The typical soil profile is 0 to 12 inches of Silty clay and 12 to 60 inches of Silty clay. The available water capacity is moderate at about 8.4 inches.

3. Elevation and Slopes

The project site generally slopes from west to east with a high elevation of approximately 200-feet at the northwest corner of the property to a low point of approximately 20-feet above mean sea level at the southeastern corner of the property.

Slopes across most of the property are mild and range from 3% to 7%. At the higher elevations the slopes increase to about 10%.

4. Solar Radiation

The project site receives a significant amount of sunshine throughout the year. The average daily solar radiation received across the project site ranges from a low of approximately 350 solar calories per square centimeter per day at the higher elevations to a high of 450 solar calories per square centimeter per day at the lower elevations.

5. Rainfall

The project site receives its highest rainfall during the winter and lowest rainfall during the summer. Throughout the year rainfall is relatively low, averaging approximately 20- to 30-inches per year, with the monthly average ranging from 0.25 inches in August to approximately 5-inches in January.

6. Temperatures

Central Maui's coldest month is February when the average nighttime temperature drops to 63.1°F. The warmest month is September with the average day time temperature rising to 88.1°F.

7. Winds

The project site experiences relatively strong trade winds that blow from north to south across the isthmus and out to sea. At 30-feet above the ground, wind speeds across the site range from approximately 5.5 meters per second to 7.5 meters per second, which is approximately 12 to 17 miles per hour.

8. Irrigation Water

The MTP currently receives its agricultural water from the Wailuku Water Company (WWC). WWC delivers water to MTP and HC&S from the Iao-Waikapu Ditch via the Waihee Ditch, the Waihee Ditch below the Hopoi Chute, and the South Waikapu Ditch. Water to irrigate HC&S's fields that are leased from the Atherton Group, approximately 1,230 acres known as the "Iao-Waikapu Fields", is from the Iao Stream via the Iao-Waikapu Ditch and Waikapu Stream via the South Waikapu Ditch and Waihee Ditch. HC&S reportedly uses between 8 and 10 mgd of ditch water to irrigate its Iao-Waikapu fields.

9. Road Access

Access to the property is from Honoapiilani Highway. Within the highway, agricultural roads provide access throughout the site.

B. PRIOR AGRICULTURAL USE

Historically, WCT's lands were owned by Wailuku Agribusiness before being sold to the current owner in 2006. WCT land has been farmed since pre-contact, with taro cultivation occurring along the Waikapu Stream. During the sugar boom of the late 1800s, WCT land was placed into

sugar production. Wailuku Sugar Company grew sugarcane on the lands until 1988. Thereafter, the Maui Land & Pineapple Company leased land for pineapple production and HC&S leased land both mauka and makai of Honoapiilani Highway to supplement its sugar production. Pineapple ceased to be farmed on the property in about 1997. Meanwhile, HC&S continues to lease 1,230 acres for sugarcane.

C. CURRENT AGRICULTURAL USE

1. HC&S.

Alexander & Baldwin (A&B), owners of HC&S, began producing sugar in Central Maui as far back as 1870. Today, HC&S is Hawaii's sole sugar plantation and the state's largest farm, with over 36,000 acres in cultivation and approximately 754 employees. The firm's business pursuits include growing and milling sugar cane, producing raw sugar and specialty food grade sugars, producing molasses and generating and selling electricity generated from cane fiber.

In 2010, HC&S produced 171,800 tons of raw sugar, which was equivalent to 5% of the U.S. production. The farm also produced 52,800 tons of molasses, which it sells as feedstock for the livestock industry. HC&S also generates power by burning residual cane fiber in its generating plants

HC&S owns 32,400 acres and leases 1,450 acres from the State and approximately 1,230 acres from the Applicant (Waikapu Properties LLC and Waiale 905 Partners LLC). HC&S is a major water user using approximately 200 million gallons per day (MGD) for irrigation.

2. Kumu Farms

Kumu Farms was established in Hawaii in 1980. Its founder and owner, Mr. Gram Schmlle, first established the farm on Oahu's North Shore, but quickly moved his operation to the Molokai Agricultural Park.

Today, Kumu Farms is one of the largest certified organic producers in the State of Hawaii and the only exporter of fresh organic papaya to the U.S. Mainland Market. The Molokai farm spreads over 120 acres and produces over 20,000 pounds of papayas, 4,000 pounds of sweet basil, 500 pounds of fresh herbs, and specialty fruit and vegetable crops. Kumu Farms also produces value added products, including lotion and a pesto line. Kumu products are sold on Maui, Oahu and the U.S. Mainland. Products are marketed directly to consumers at the Farm's on-site store as well as on-line. Products are also sold to wholesalers and retailers such as Armstrong Produce and Whole Foods.

In 2012 Mr. Schmlle expanded his farm to the MTP. The MTP farm is on 75 acres and grows mixed-fruits, vegetables, and herbs. Like the Molokai farm, the MTP's products are sold on-site at a farm stand as well as on-line and directly and indirectly to restaurants and retail stores.

3. Hawaii Taro Farm LLC

Hawaii Taro Farm LLC is owned by Robert Pahia. Mr. Pahia was an agricultural researcher at the University of Hawaii for over 20 years. He has 20 years of farming experience in a variety of crops, including taro, vegetables, banana, sweet potato and melons.

Hawaii Taro Farm LLC has been at the MTP since 2009. The 68 acre farm is producing dry-land taro, sweet potato, and banana. Its primary market is Maui, but products are also sold on Oahu.

4. Mr. Michael Atherton, Coffees of Hawaii; Cerro de Jesus Coffee Plantation Nicaragua; Part Owner of the MTP and abutting Agricultural Lands

Mr. Atherton comes from a farming and ranching family in northern California. He established the Cerro de Jesus (Jesus Mountain) coffee plantation in Nicaragua in 1972. The plantation produces specialty coffee, including several Arabica varieties, like Bourbon, Caturra, Catuai Rojo and Pacamara, on approximately 1,000 acres with over a million trees

planted. Mr. Atherton also owns Coffees of Hawaii, which sells coffee from Molokai, Maui and Kona, as well as blends that utilize his Nicaraguan beans. Mr. Atherton owns approximately 100 acres of coffee trees on Molokai.

In addition to coffee farming, Mr. Atherton has experience raising cattle. Mr. Atherton has a small herd of Texas Long-horn cattle that graze on the MTP.

D. IMPACT OF THE PROJECT ON AGRICULTURE

1. Loss of State and County Agricultural Lands

As discussed, the project will result in the conversion of approximately 450 acres of prime agricultural land to urban and rural use. It should be assumed that once urbanized the opportunity to use these lands for commercial agriculture will be irrevocably lost.

As described, the loss of approximately 450 acres of prime agricultural land caused by the subject development represents a very small percentage of agricultural lands statewide and on Maui, as is shown below:

- There are approximately 2 million acres in the State Agricultural District. The subject development represents just .022% of this area.
- There are approximately 846,363 acres of agricultural lands state-wide rated by ALISH as Prime, Unique or Other. The subject development represents just .053% of these lands.
- There are approximately 447,250 acres of agricultural lands state-wide rated by the LSB as A, B, or C. The subject development represents just .10% of these lands.
- On Maui, there are approximately 82,582 acres of agricultural lands rated by the LSB as A, B, or C. The subject development represents just .54% of these lands.

- Within Maui County, approximately 64,000 acres has been released from crop production since 1987. The subject development represents just .7% of these lands.

However, to mitigate the loss of prime agricultural lands caused by urbanization, the Applicant will permanently protect 800 acres of prime farm land through a conservation easement. As noted above and in Sections III.B and IV of this report, there is a considerable amount of agricultural land throughout the state that is fallow. However, despite the availability of land, the ability of farmers to secure access to affordable lands for long-term tenure is still an impediment to agricultural development. High land costs, coupled with high labor costs, transportation costs, and energy costs are among the most significant barriers to Hawaii's agricultural development.

By establishing an agricultural park on agricultural lands surrounding the proposed Waikapu Country Town, the project will provide farmers with long-term access to agricultural land at an affordable rate. As noted, there are 3,123 acres and 227 lots within the State of Hawaii's agricultural parks, but only two lots are currently available. In Maui County there are no agricultural park lots available at either the Molokai Agricultural Park or the Kula Agricultural Park. The proposed agricultural park will expand the opportunity for Maui farmers to gain access to highly productive Central Maui agricultural lands. These lands provide easy market access to Maui's primary population centers and to major air and seaport facilities.

2. Impact of the Project on Existing Agricultural Operations

On May 17, 2013, Kumu Farms, Hawaii Taro LLC, and land owner and farmer Michael Atherton were interviewed to determine the potential impact of the project upon their agricultural operations. On June 26, 2013, an interview was conducted with HC&S to discuss the impact of the project on their sugar business.

During the interview it was explained that no lands would be urbanized for at least three years while entitlements and building permits are being obtained. Thereafter, urbanization would occur in phases at a rate determined by market demand. It was acknowledged that lands currently being farmed could be impacted by the development over the next five to 10 years.

Both Kumu Farms and Hawaii Taro LLC desire to shift their farms to the MTP's private agricultural park as urban development is phased in. They anticipate that, together with other farmers, the Park could encompass several hundred acres. Most of each farm's future production will be sold to the Maui market, but production is also expected to be shipped to Oahu and the Mainland.

Land owner Michael Atherton is grazing Texas Long-Horn cattle on the property. Mr. Atherton indicated that the herd will likely remain on the mauka agricultural lands above the existing MTP even after urbanization occurs on the makai lands. Mr. Atherton also intends to plant an orchard of coffee trees. The orchard will be located outside of the urban and rural growth boundaries on existing agricultural lands. The beans will be marketed and sold under the Coffees of Hawaii label.

HC&S is farming 1,230 acres of MTP lands. These lands are leased on a 10-year term, which is due to expire for some of the lands, but is being renegotiated for a new 10-year term. MTP leased lands comprise approximately 3.6% of HC&S lands that are in production. Of the 1,230 acres leased by HC&S, approximately 330 acres will eventually be urbanized over an approximate 20-year build-out. In addition, about 75 acres currently in cane production may be used to establish a portion of the agricultural park discussed in this report. The agricultural park would also comprise agricultural lands not currently in cane production, which are located mauka (west) and south of the existing MTP.

HC&S desires to continue farming MTP lands. The farm's General Manager, Mr. Rick Volner, noted that MTP lands are highly productive with access to a reliable source of water. Mr. Volner noted that the amount of acres to be urbanized is very small relative to the total number of acres being farmed by HC&S. However, since HC&S is a commodity farmer the profitability of the plantation depends upon having sufficient economy of scale in its production. The incremental loss of agricultural land is therefore a concern to the plantation; however, Mr. Volner noted that HC&S has access to other, currently fallow, lands and that the Plantation's viability will not be significantly impacted by the urbanization of the subject MIP lands.

An additional concern of the Plantation is urban development that is located within close proximity of its fields. Land use conflicts, such as the impact of dust, noise, and smoke from cane burning, can be a problem if not carefully managed. However, Mr. Volner noted that the subject property is upwind of its fields and that the consistent trade winds will help to mitigate such impacts. Mr. Volner also noted that cane burning is carefully managed in order to minimize its impact to neighboring residential communities.

3. Impact of the Project on Future Agricultural Opportunities

As discussed in this report, the impact of the proposed urbanization on future agricultural opportunities should be minimal since other lands are currently available throughout the State and County.

As noted, a significant impediment to agricultural development on Maui, and throughout the State, is the scarcity of affordable agricultural land that is readily available and affordable for long-term lease to diversified farmers. The project's agricultural component includes nearly 1,100 acres of agricultural land, 800 acres of which will be permanently dedicated to agricultural use with no residential structures to be permitted. The long-term vision for this land is to establish a private agricultural

park. This park will be anchored by highly qualified farmers, such as Kumu Farms, Coffees of Hawaii and Hawaii Taro LLC. Future agricultural users will have the opportunity to grow crops ranging from fresh vegetables and fruits, to taro, coconuts, coffee and kakau. It is expected that sugarcane, bio-fuels or cattle will also be major agricultural land users.

E. CONCLUSIONS

The Waikapu Country Town comprises approximately 1,675 acres, of which 50 acres are within the State Urban District and the remaining land is within the State Agricultural District. Approximately 92% of WCT agricultural lands, or 1,495 acres, are rated “A” or “B” by the LSB. According to the ALISH rating system, 97%, or 1,576 acres, is “Prime” agricultural land. The MTP, and surrounding HC&S fields, currently receive agricultural water from WWC. HC&S’s Iao-Waikapu fields, which are leased from the Atherton Group, reportedly use between 8 to 10 mgd of irrigation water.

The loss of approximately 450 acres of prime agricultural land caused by the subject development represents a very small percentage of agricultural lands statewide and on Maui. There are approximately 2 million acres in the State Agricultural District. The subject development represents just .022% of this area. On Maui, there are approximately 82,582 acres of agricultural lands rated by the LSB as A, B, or C. The subject development represents just .54% of these lands. Within Maui County, approximately 64,000 acres has been released from crop production since 1987. The subject development represents just .7% of these lands.

There are currently three commercial farms farming MTP lands. These include Kumu Farms, Hawaii Taro LLC, and HC&S. The proposed urbanization will require both Kumu Farms and Hawaii Taro LLC to relocate their agricultural operations to the proposed agricultural park. It is anticipated that this might occur in about five to ten years. The

project will also impact the current lands being leased by HC&S. It is anticipated that these lands will gradually begin to be impacted in about five to ten years. Over the long-term, HC&S may lose approximately 330 acres to urbanization and up to 75 acres for a private agricultural park. According to HC&S General Manager Mr. Rick Volner, HC&S would desire to continue farming its lands to maximize its current economy of scale in production. However, Mr. Volner acknowledged that HC&S has additional lands available that are currently fallow and the subject project will not impact the Plantation's long-term viability.

A significant impediment to agricultural development on Maui, and throughout the State, is the scarcity of affordable agricultural land that is readily available and affordable for long-term lease to diversified farmers. The project's agricultural component includes nearly 1,100 acres of agricultural land, 800 acres of which will be permanently dedicated to agricultural use with no residential structures to be permitted. Several hundred acres of MTP agricultural lands may be developed as a private agricultural park to help facilitate Maui's agricultural development. The establishment of a strategic and centrally located agricultural park, with the availability of highly productive agricultural land and affordable irrigation water, should significantly bolster the ability of Maui farmers to compete in local, mainland and international markets.

VI. CONSISTENCY WITH STATE AND COUNTY AGRICULTURAL POLICIES

A. STATE AGRICULTURAL LAND USE POLICY

1. Hawaii State Plan and Hawaii State Functional Plans

The Hawaii State Plan and Hawaii State Functional Plans establish policy to protect the viability of the State's sugar and pineapple industries, support the growth of diversified agriculture, and protect productive agricultural lands from development. Hawaii State Plan policies that are directly relevant to the proposed action include those listed below:

Hawaii State Plan, Chapter 226, HRS Part 1. Overall Themes, Goals, Objectives and Policies
<u>Chapter 226-7 Objectives and policies for the economy-agriculture.</u>
<u>Objectives:</u> Planning for the State's economy with regard to agriculture shall be directed toward achievement of the following objectives:
Objectives:
(1) Viability of Hawaii's sugar and pineapple industries.
(2) Growth and development of diversified agriculture throughout the State.
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.
(12) Expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.
(13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency.
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:
Priority Guidelines:
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.
(10) Support the continuation of land currently in use for diversified agriculture.
<u>Chapter 226-104, HRS, Population Growth and Land Resources Priority Guidelines</u>
(a) Priority guidelines to effect desired statewide growth and distribution:
Priority Guidelines:
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.
<u>Chapter 226-106 Affordable housing. Priority guidelines for the provision of affordable housing:</u>
Priority guidelines for the provision of affordable housing:
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

The Hawaii State Plan directs State agencies to prepare functional plans for their respective program areas. There are fourteen (14) State Functional Plans that serve as the primary implementing vehicle for goals, objectives and policies of the Hawaii State Plan. Hawaii State Functional Plan policies directly relevant to the proposed action include those listed below:

Hawaii State Functional Plans
Agriculture State Functional Plan
Objectives:

- | |
|---|
| g. Achievement of effective protection and improved quality of Hawaii's land, water, and air. |
| h. Achievement of productive agricultural use of lands most suitable and needed for agricultural use. |

Analysis: The Hawaii State Plan and State Functional Plans establish policy to protect the viability of the sugar and pineapple industries, protect agriculturally suitable lands for future needs, and promote the growth of diversified agriculture.

The proposed action will result in the urbanization of approximately 450 acres of productive agricultural land that are currently in sugar production. However, as documented in this report, the following provides sufficient justification for the proposed action:

- Approximately 245 acres, or 54% of the area, will be impacted by the County's planned Waiale By-pass Road. Once constructed, the by-pass road will make large-scale sugar farming considerably more difficult on those lands.
- A considerable amount of sugar and pineapple land throughout the State and within Maui County has been released from sugar and pineapple production over the last two decades. Within Maui County, the acreage released from crop production since 1987 is approximately 64,000 acres. The subject development represents just .7% of these lands. Thus, alternative agricultural lands are available to support future agricultural development.
- In consultation with HC&S, the Plantation's General Manager indicated that HC&S's financial viability will not be significantly impacted by the development and that other A&B lands, as well as former pineapple lands, can be utilized to make up for the lost sugar production.
- The recently adopted Maui Island Plan places the subject property within an urban growth boundary because of its proximity to infrastructure, public facilities, and employment. The Plan's population projections and land use forecast demonstrate a need for additional urban land through 2030.

- The land owner has committed to establishing an agricultural conservation easement, or similar mechanism, to permanently protect approximately 800 acres of prime agricultural land adjoining the south and western boundaries of the subject development; an additional 300 acres will remain within the State agricultural district and will be restricted to large lots.
- The land owner intends to establish a private agricultural park. The agricultural park will offer affordable and highly productive agricultural lots to diversified farmers.
- The existing diversified farmers, Kumu Farms and Hawaii Taro LLC, will be relocated to the agricultural park as development is phased in over the next 10 to 20 years.

B. COUNTY AGRICULTURAL LAND USE POLICY

The County of Maui's General Plan is comprised of the County-wide Policy Plan, Maui Island Plan and nine Community Plans. The County-wide Policy Plan is the overarching policy document for the County. The Maui Island Plan is a regional plan for the Island of Maui and is responsible for directing the island's future population growth, protecting the Island's natural and cultural resources, and locating large-scale intraregional infrastructure and public facility investments. The Community Plans define the character of community development, priority of sub-regional infrastructure and public facility investments, and needed policies and actions to protect sensitive environmental and cultural resources within each community plan area.

1. County-wide Policy Plan

The County-wide Policy Plan establishes a list of county-wide goals, objectives, policies, and implementing actions related to key strategies. The following County-wide Policy Plan goals, objectives and actions are directly relevant to the proposed action:

Countywide Policy Plan
Objective:

(2) Diversify and expand sustainable forms of agriculture and aquaculture.
Policies:
b. Prioritize the use of agricultural land to feed the local population, and promote the use of agricultural lands for sustainable and diversified agricultural activities.
d. Assist farmers to help make Maui County more self-sufficient in food production.
e. Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.
Implementing Actions:
c. Create agricultural parks in areas distant from genetically modified crops.
<u>J. Promote Sustainable Land Use and Growth Management</u>
Goal: Community character, lifestyles, economies, and natural assets will be preserved by managing growth and using land in a sustainable manner.
(2) Improve planning for and management of agricultural lands and rural areas.
Policies:
a. Protect prime, productive, and potentially productive agricultural lands to maintain the islands' agricultural and rural identities and economies.
Implementing Actions:
a. Inventory and protect prime, productive, and potentially productive agricultural lands from competing non-agricultural land uses.

2. Maui Island Plan

The Maui Island Plan serves as the regional plan for the Island of Maui. The Plan is comprised of the following ten elements: 1) Population; 2) Heritage Resources; 3) Natural Hazards; 4) Economic Development; 5) Housing; 6) Infrastructure and Public Facilities; 7) Land Use; 8) Directed Growth Plan; 9) Long Range Implementation Plan; and 10) Monitoring and Evaluation. Each element contains goals, objectives, policies and implementing actions. The Directed Growth Plan is intended to guide the location and general character of future urban

development and will direct zoning changes and guide the development of the County's short-term and long-term capital improvement plan budgets.

Maui Island Plan policies directly relevant to the proposed action include those listed below:

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

4.3 Maui will have a diversified agricultural industry contributing to greater economic, food, and energy security and prosperity.

Objective:

4.3.1 Strive for at least 85 percent of locally-consumed fruits and vegetables and 30 percent of all other locally-consumed foods to be grown in-State.

Policies:

4.3.1.a Strive to substitute food/agricultural product imports with a reliable supply of locally produced food and agricultural products.

4.3.1.b Facilitate and support the direct marketing/sale of the island's agricultural products to local consumers, through farmers markets and similar venues.

4.3.1.c Encourage growing a diverse variety of crops and livestock to ensure the stewardship of our land while safeguarding consumer safety.

Implementing Actions:

4.3.1-Action 1 Encourage the development of community gardens, including gardens on greenbelts that separate communities.

Objective:

4.3.2 Maintain or increase agriculture's share of the total island economy.

Policies:

4.3.2.c Encourage the continued viability of sugar cane production, or other agricultural crops, in central Maui and all of Maui Island.

GOAL, OBJECTIVES, POLICIES, AND ACTIONS

Goal:

7.1 Maui will have a prosperous agricultural industry and will protect agricultural lands.

Objective:

7.1.1 Significantly reduce the loss of productive agricultural lands.

7.1.1.e Focus urban growth, to the extent practicable, away from productive and important agricultural lands.

7.1.1.f Strongly discourage the conversion of productive and important agricultural lands (such as sugar, pineapple, and other produce lands) to rural or urban use, unless justified during the General Plan update, or when other overriding factors are present.

Implementing Actions:

7.1.1-Action 1 Implement the Maui Island Directed Growth Strategy.

Objective:

7.1.2 Reduction of the island's dependence on off-island agricultural products and expansion of export capacity.

Policies:

7.1.2.c Actively look to acquire land and provide infrastructure to expand agricultural parks and establish new agricultural parks.

7.1.2.g Consider appropriate subdivision requirements (gravel roads, above-ground utilities, etc.) in those subdivisions creating Agricultural Parks where lots are limited to agricultural production with no dwellings.

Implementing Actions:

7.1.2-Action 1 Identify and acquire productive and community agricultural lands that are appropriate for the development of agricultural parks and community gardens in each community plan area.

3. Wailuku-Kahului Community Plan

Within Maui County, there are nine (9) community plan regions. Each region is governed by a Community Plan. The Waikapu Country Town is located within the Wailuku-Kahului Community Plan region that was adopted by Ordinance No. 3061 on June 5, 2002. Wailuku-Kahului Community Plan policies directly relevant to the proposed action include those listed below:

GOAL, OBJECTIVES, POLICIES, AND IMPLEMENTING ACTIONS

ECONOMIC ACTIVITY

Goal:

A stable and viable economy that provides opportunities for growth and diversification to meet long-term community and regional needs and in a manner that promotes agricultural activity and preserves agricultural lands and open space resources.

Objectives and Policies:

1. Support agricultural production so agriculture can continue to provide employment and contribute to the region's economic well-being.
9. Support the establishment of agricultural parks for truck farming, piggery operations, bee keeping and other diversified agricultural operations within larger unsubdivided agricultural parcels and in locations that are compatible with residential uses.

ENVIRONMENT

Goal:

A Clean and attractive physical and natural environment in which man-made developments or alterations to the natural environment relate to sound environmental and ecological practices, and important scenic and open space resources are maintained for public use and enjoyment.

Objectives and Policies:

1. Preserve agricultural lands as a major element of the open space setting that borders the various communities within the planning region. The close relationship between open space and developed areas is an important characteristic of community form.

HOUSING

Goal:

A sufficient supply and choice of attractive, sanitary and affordable housing accommodations for the broad cross section of residents, including the elderly.

Objectives and Policies:

2. Provide sufficient land areas for new residential growth which relax constraints on the housing market and afford variety in type, price, and location of units. Opportunities for the provision of housing are presently constrained by a lack of expansion areas. This condition should be relieved by a choice of housing in a variety of locations, both rural and urban in character.
3. Seek alternative residential growth areas within the planning region, with high priority given to the Wailuku and Kahului areas. This action should recognize that crucial issues of maintaining important agricultural lands, achieving efficient patterns of growth, and providing adequate housing supply and choice of price and location must be addressed and resolved.

LAND USE

Goal:

An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the social and economic well-being of residents and the preservation and enhancement of the region's environmental resources and traditional towns and villages.

Objectives and Policies:

1. Ensure that adequate lands are available to support the region's present and future agricultural activities.
2. Identify prime or productive agricultural lands, and develop appropriate regulations for their protection.
6. Establish an adequate supply of urban land use designations to meet the needs of the community over the next 20 years.

Analysis: The Maui County General Plan (County-wide Policy Plan, Maui Island Plan, and Wailuku-Kahului Community Plan) seek to preserve productive agricultural lands and facilitate agricultural self-sufficiency in food production. The Plans also recognize the need to provide sufficient land areas to accommodate future population growth. Goal 7.1.1.f of the Maui Island Plan states, *“Strongly discourage the conversion of productive and important agricultural lands (such as sugar, pineapple, and other produce lands) to rural or urban use, unless justified during the General Plan update, or when other overriding factors are present.”* Although the area to be urbanized is considered prime farmland, other overriding considerations include the desire to locate future growth within close proximity of the Central Maui employment center; and to take advantage of existing and planned infrastructure and public facility improvements, such as the proposed Waiale Bypass road that bisects the subject property, the County’s proposed 100-acre Central Maui baseyard located along the eastern boundary of the project, and the approximate 200-acre Central Maui regional park proposed on abutting A&B lands along Kuhilani Highway. Other important factors include the availability of potable and non-potable water on-site to serve the development, the suitability of the land and its location for affordable housing, and the project’s close proximity to the small town of Waikapu and A&B Properties’ proposed Waiale Development. Moreover, the landowner’s willingness to permanently protect approximately 800 acres of prime agricultural lands to serve as a permanent open space separation between Waikapu and the small coastal community of Maalaea was an important consideration.

In addition, as documented in this report, the urbanization of the subject lands will not significantly impact the future viability of the sugar or pineapple industries or the growth of diversified agriculture. As noted, there has been a tremendous amount of land released from sugar and pineapple over the last thirty years. Much of this land is available for agricultural use. Moreover, the land owners desire to establish an agricultural park will directly address the difficulty that many farmers have when trying to lease productive agricultural lands at an affordable rate for long-term tenure. With successful diversified farmers, such as Kumu Farms and Hawaii Taro LLC, being key tenants at the Park, the island of Maui should be able to become

more self-sufficient in food production, while also diversifying and growing the island's agricultural economy.

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