

**ENVIRONMENTAL ASSESMENT/  
ENVIRONMENTAL IMPACT STATEMENT  
PREPARATION NOTICE**

**South Kona Watershed Irrigation Project**

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

*Prepared for:*

State of Hawai'i Department of Agriculture



*Prepared by:*



Belt Collins Hawaii Ltd.

July 2009

# TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS.....	iii
SUMMARY .....	iv
1 PROPOSING AGENCY .....	1
2 ACCEPTING AUTHORITY.....	1
3 PURPOSE OF DOCUMENT .....	1
4 AGENCIES, CITIZEN GROUPS, AND INDIVIDUALS CONSULTED.....	1
5 GENERAL PROJECT DESCRIPTION.....	2
5.1 Alternatives, Including the Proposed Action .....	2
5.2 Purpose and Need for the Proposed Action .....	2
5.3 Project Area.....	6
5.4 Project History .....	6
6 SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT AND ANTICIPATED IMPACTS.....	7
6.1 Land Use Designations and Controls .....	7
6.2 Climate and Air Quality .....	8
6.3 Historic Properties and Traditional Cultural Practices .....	8
6.4 Flora and Fauna .....	9
6.5 Geology, Topography, and Soils .....	10
6.6 Water Quality, Surface Water, and Ground Water Resources .....	11
6.7 Marine Environment .....	12
6.8 Noise .....	12
6.9 Hazardous Materials and Waste .....	12
6.10 Public Services, Facilities, Utilities, and Traffic .....	13
6.11 Visual Resources.....	13
6.12 Natural Hazards.....	13
6.13 Socio-Economic and Community Conditions .....	14
7 DISCUSSION OF SIGNIFICANCE CRITERIA.....	15
8 ANTICIPATED DETERMINATION.....	16
9 ANTICIPATED PERMITS AND APPROVALS NEEDED .....	16
10 REFERENCES.....	16

**LIST OF FIGURES**

Figure 1 Project Location ..... 3  
Figure 2 Proposed Action–3 Wells ..... 4  
Figure 3 12-Well Alternative ..... 5

## ACRONYMS

AIS	Archaeological Inventory Survey
BMPs	Best Management Practices
CIA	Cultural Impact Assessment
DBEDT	Department of Business, Economic Development, and Tourism (State of Hawai'i)
DEIS	Draft Environmental Impact Statement
DLNR	Department of Land and Natural Resources (State of Hawai'i)
DOA	Department of Agriculture (State of Hawai'i)
DOH	Department of Health (State of Hawai'i)
DPW	Department of Public Works
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
ENSO	El Nino Southern Oscillation
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HAR	Hawai'i Administrative Rules
HCGP	Hawai'i County General Plan
HRS	Hawai'i Revised Statutes
KCDP	Kona Community Development Plan
KSWCD	Kona Soil and Water Conservation District
MGD	Million Gallons per Day
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service (USDA)
SHPD	State Historic Preservation Division
UBC	Uniform Building Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Vog	Volcanic smog

## SUMMARY

- PROJECT NAME:** South Kona Watershed Irrigation Project
- PROPOSING AGENCY:** State of Hawai'i Department of Agriculture (DOA)
- LOCATION:** South Kona District, County of Hawai'i
- TAX MAP KEY:** Zone 8, Section 9, various plats, and a part of Section 8
- LAND OWNERSHIP:** Private and State
- CLASS OF ACTION:** Use of State and County Funds
- DETERMINATION:** The DOA has determined that there may be sufficient controversy about whether the project has the potential to cause significant impacts to the environment that an Environmental Impact Statement (State and Federal EIS) is necessary.
- PROPOSED ACTION:** Construct three irrigation wells, associated reservoirs, and an irrigation system to serve farms primarily in the Honomalino/Kapua area in the South Kona District.

### PURPOSE, NEED, AND DESCRIPTION:

The purpose of the Proposed Action is to provide a supplemental water source to increase agricultural productivity in the South Kona District of the island of Hawai'i. The South Kona District has experienced drought conditions for roughly 20 years that has severely impacted the agricultural sector of the local economy. The wells would be drilled at the 2,600- to 2,800-ft elevation with a capacity to produce 3 MGD (million gallons per day) which would be held in reservoirs adjacent to each well. The irrigation system would distribute the water to approximately 4,600 acres of existing coffee, macadamia nut, and other crops; and approximately 1,300 additional acres of coffee and other crops.

### CONTACT FOR FURTHER INFORMATION:

Mr. Brian Kau, P.E., Administrator and Chief Engineer  
State of Hawai'i Department of Agriculture  
Agricultural Resource Management Division  
1428 South King St.  
Honolulu, HI 96814-2512  
(808) 973-9473

## **1 PROPOSING AGENCY**

The proposing agency is the State of Hawai'i Department of Agriculture (DOA).

## **2 ACCEPTING AUTHORITY**

The accepting authority is the DOA.

## **3 PURPOSE OF DOCUMENT**

The Natural Resources Conservation Service (NRCS) and DOA are planning to conduct National Environmental Policy Act (NEPA) and Hawai'i Revised Statutes (HRS) Chapter 343 environmental reviews of alternatives intended to address the agricultural water shortages in the South Kona District of the island of Hawai'i. Other stakeholders for the project are the County of Hawai'i Department of Research and Development, which has received funding from the EPA to support this project, the Kona Farm Bureau, and the Kona Soil and Water Conservation District (KSWCD).

This Environmental Impact Statement Preparation Notice (EISPN) has been prepared in accordance with HRS Chapter 343 and its implementing rules. The proposed Environmental Impact Statement (EIS) will be prepared in accordance with the Hawai'i EIS law HRS Chapter 343 and the NEPA.

## **4 AGENCIES, CITIZEN GROUPS, AND INDIVIDUALS CONSULTED**

The agencies, citizen groups, and individuals consulted to date are as follows:

### **Federal**

U.S. Department of Agriculture (USDA)

U.S. Fish and Wildlife Services (USFWS)

### **State of Hawai'i**

Department of Business, Economic Development, and Tourism (DBEDT)

Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD)

Kona Soil and Water Conservation District (KSWCD)

### **County of Hawai'i**

Department of Research and Development

### **Citizen Groups and Individuals**

Kona County Farm Bureau

Members of the Honomalino Irrigation Cooperative (dissolved in 2008)

Property owners in the project area

These agencies and individuals will continue to be consulted during the preparation of the Draft Environmental Impact Statement (DEIS).

## **5 GENERAL PROJECT DESCRIPTION**

### **5.1 Alternatives, Including the Proposed Action**

#### **Proposed Action – Three Wells**

The Proposed Action would construct three irrigation wells and reservoirs on the upper boundary of the project area at an elevation of approximately 2,600 to 2,800 feet on private and public lands in the South Kona District of the island of Hawai'i (Figures 1 and 2). These wells would produce 3 MGD of water which would be held in reservoirs adjacent to each well. The irrigation system would distribute the water to approximately 4,600 acres of existing coffee, macadamia nut, and other crops, and approximately 1,300 additional acres of coffee and other crops.

#### **Twelve - Well Alternative**

This alternative would construct twelve irrigation wells and reservoirs at the 2,600- to 2,800-foot elevation on private and public lands, connected by a pipe to bring the water to the reservoirs (Figure 3). These wells would produce 12 MGD of water which would be delivered to the reservoirs by a pipe. The associated irrigation network would distribute the water to approximately 11,600 acres of farmland, enabling all of the arable land in the project area to be brought into production.

#### **No Action Alternative**

Evaluation of this alternative will consider no change to the current irrigation water sources for the watershed. This alternative serves as the baseline against which the effects of implementing the other alternatives would be assessed.

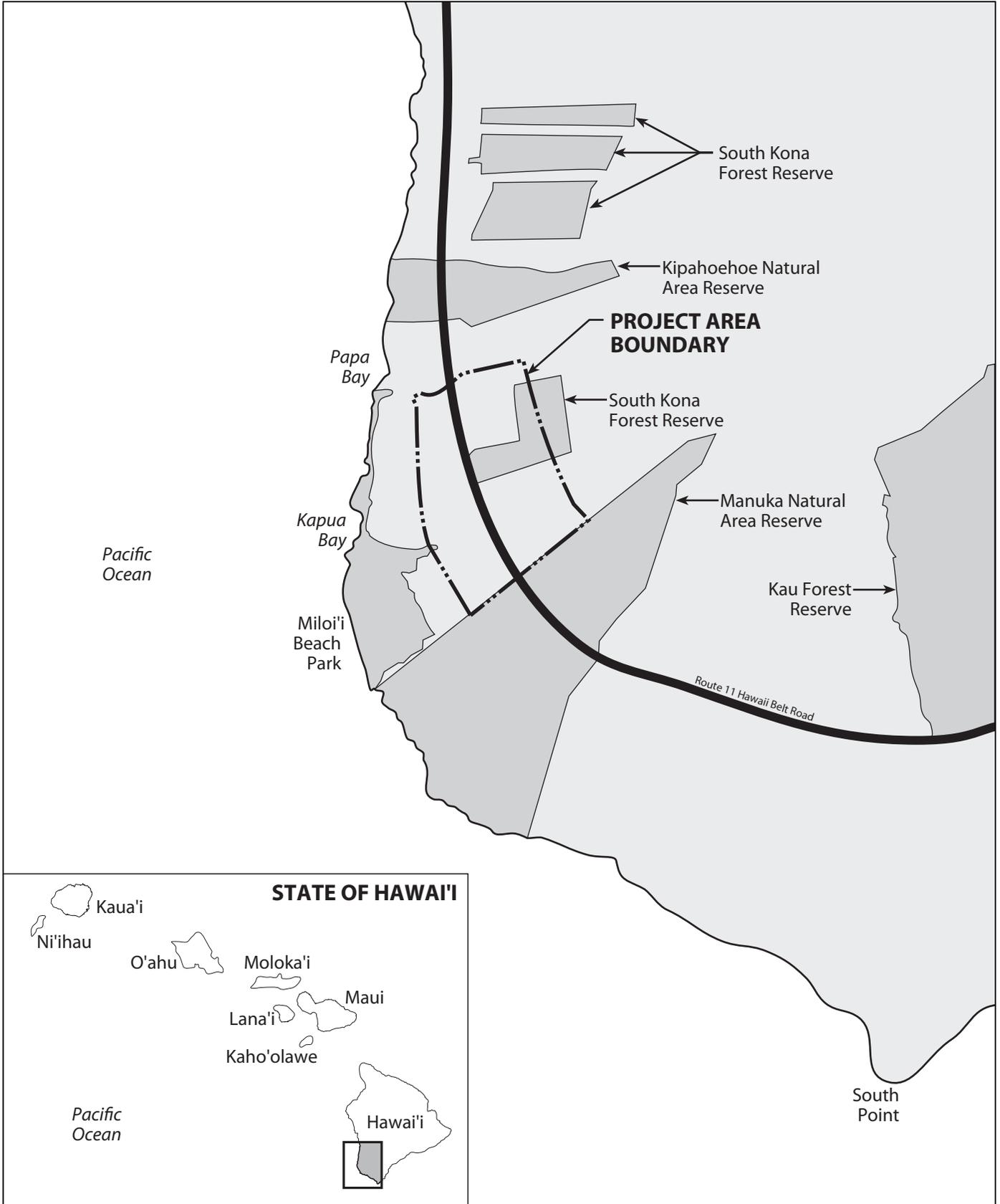
### **5.2 Purpose and Need for the Proposed Action**

The purpose of the South Kona Watershed Irrigation System is to provide a stable, adequate, and affordable supply of fresh water to farms in the Honomalino/Kapua area to alleviate drought-related water shortages. When completed, the project will provide irrigation water to approximately 6,000 acres of farmland.

An irrigation system is needed because the South Kona District had been in the grip of a long-term drought that began in 1982. This drought, possibly a result of changing rainfall patterns caused by the increased volcanic emissions from Kilauea Volcano,<sup>1</sup> has caused significant adverse impacts to existing crops, limits farmers' capacity to maximize the full agricultural

---

<sup>1</sup> U.S. Geological Survey, October 2001



**Figure 1**  
**VICINITY MAP**





© 2009 Belt Collins Hawaii Ltd. K-2009.700300/002-1.dwg 2009Jul13 5

**LEGEND**

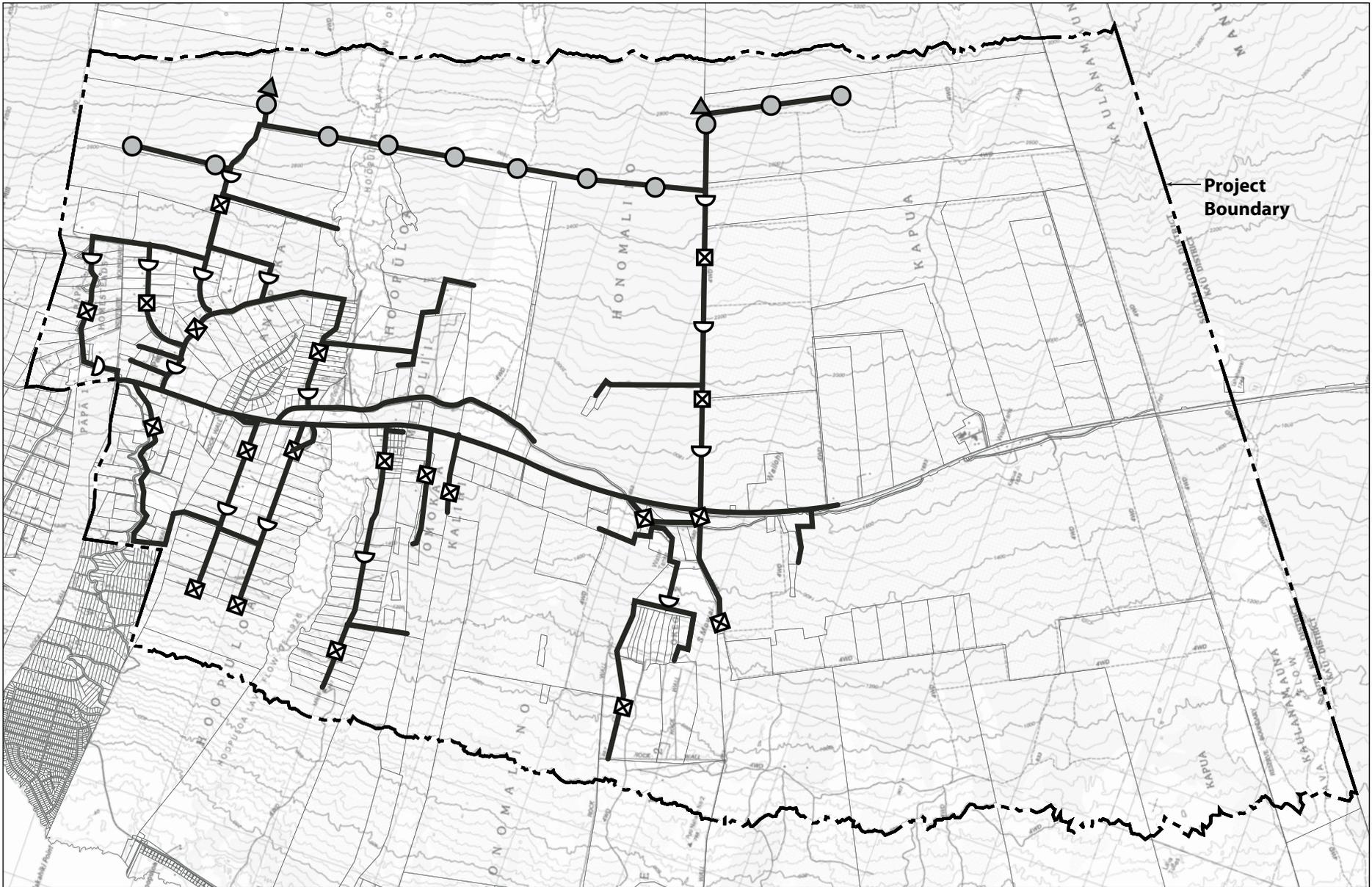
- Irrigation Wells
- ▲ Reservoirs
- ◐ Breaker Tanks
- ⊠ Pressure Reducing Valves
- Irrigation Lines
- Parcel Lines



0 1000 2000 4000  
SCALE IN FEET

**Figure 2**  
**PROPOSED ACTION—3 WELLS**

South Kona Watershed Irrigation Project  
July 2009



© 2009 Belt Collins Hawaii Ltd. K-2009-700300/004-8-6ly 2009Jul13 2

**LEGEND**

- Irrigation Wells
- ▲ Reservoirs
- ⊠ Pressure Reducing Valve
- Irrigation Lines
- Parcel Lines



0 1000 2000 4000  
SCALE IN FEET

**Figure 3**  
**12-WELL ALTERNATIVE**

South Kona Watershed Irrigation Project  
July 2009

potential of their land, and has resulted in long-term regional economic distress. Supplemental water is sometimes trucked in, but this not a viable long-term solution.

### 5.3 Project Area

The project area consists of approximately 15,000 acres of public and private lands located inland of Miloli'i in the South Kona District on the island of Hawai'i (see Figure 1). The project area is bounded to the north by the Papa 1 Homesteads, to the east by the 3,000-foot elevation contour, to the south by the Manuka Natural Area Reserve, and to the west by the 800-foot elevation contour (see Figure 2).

The project area comprises well and reservoir sites and pipeline corridors within Papa 1 and 2, Anapuka, Ho'opuloa, Miloli'i, Omoka'a, Kalihi, and Honomalino (TMK: (3)8-8-16:23; 8-9-01:2,19, & 20;8-9-02:12 & 14; and 8-9-13:27). Route 11 (Hawai'i Belt Road or Mamalahoa Highway) extends across the project area north to south at elevations of about 1,680 to 1,700 feet. The physiographic feature found in the project area is Mauna Loa Undissected Uplands, which are defined as "slopes with little or no established surface drainage."<sup>2</sup>

Of the over 15,000 acres of project area, about 12,000 acres (80 percent) are agricultural, with approximately 4,600 in active use, with the remaining 3,000 acres (20 percent) comprising unused land and the South Kona Forest Reserve. The major agricultural uses in the project area are primarily for orchards – macadamia nuts, coffee, and various tropical fruits. Future agricultural use expansion is anticipated to be mainly for coffee and tropical fruits.

### 5.4 Project History

The South Kona Watershed Irrigation project was first conceived in 2000 when the Honomalino Irrigation Cooperative was formed to organize efforts to address the drought problems in the region by securing a supplemental water source for the farmers in the Honomalino and Kapua areas. In 2008, the Cooperative was dissolved. Currently, the Kona County Farm Bureau represents of the local agricultural interests.

To ascertain whether a groundwater-based irrigation system would work, the NRCS and the DOA, together with the Honomalino Irrigation Cooperative and the KSWCD sponsored an irrigation system preliminary feasibility study. The study was completed in December 2003.<sup>3</sup> It concluded that such a system could be cost-effective under certain conditions and provide sufficient relief to area farms to maintain their viability.<sup>4</sup>

---

<sup>2</sup> Armstrong 1983:37.

<sup>3</sup> Belt Collins, December 2003.

<sup>4</sup> Two subsequent cost-benefit analyses produced conflicting results as to the cost-effectiveness of the project. Energy costs make up 90 percent of the operating costs of such a system, and the price of electricity, together with other inputs to farm production, had increased. The second study was prepared in 2007. The third study was prepared in 2008, and concluded that such a system would not be cost-effective.

It was agreed that an EIS should be prepared even in the absence of funding to complete the project, as the EIS process could take some time. A Notice of Intent (NOI) to prepare an EIS for the federal NEPA process was published in the Federal Register on June 7, 2005. A meeting was held on June 7, 2005, in South Kona to provide the community with an opportunity to discuss the project boundaries, the desired quality of the well water, how water would be accessed during the build-out phase of the distribution system, and how the project would be funded. Immediately following this meeting, and also on June 8 and 29, 2005, additional interviews and meetings took place with local residents and landowners, followed by phone interviews with some of the key landowners and managers of the farms in the area, to discuss and raise awareness of the proposed project.

Two public scoping meetings, as announced in the NOI, were held on June 21, 2005, in South Kona to gather public input on the proposed project, provide an overview of the environmental review process, and explain the project alternatives. The public comment period for the scoping process concluded on July 29, 2005.

In March 2006, the U.S. Environmental Protection Agency (EPA) entered into a contract with the County of Hawai'i to support the required research and preparation of an EIS for an agricultural irrigation system in the communities of Honomalino and Kapua on the island of Hawai'i. The State EIS phase of the project is beginning with this EISPN.

## **6 SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT AND ANTICIPATED IMPACTS**

### **6.1 Land Use Designations and Controls**

#### **Hawai'i County General Plan (HCGP)**

The 2005 HCGP is the policy document for the long-range comprehensive development of the island of Hawai'i. According to the HCGP, agriculture is responsible for 9.5 percent of Hawai'i's employment and is South Kona's primary economic activity, with its most important industries being coffee, macadamia nuts, and citrus fruits. Kona coffee is still considered one of the most promising agricultural products grown within the County of Hawai'i, despite the increasing costs to produce. Agriculture has shown substantial growth on the island.

The HCGP states that the opportunities for the expansion of agriculture on Hawai'i seem to be promising: the demand for fresh, locally grown products is growing as restaurants, grocery stores, and hotels seek the highest quality products for their customers. The HCGP notes, however, that agriculture faces numerous challenges including a labor shortage, workforce housing problems, and a competing demand for land for housing development. The primary course of action recommended by the HCGP for South Kona is to protect important agricultural land from urbanization, and to provide necessary infrastructure, such as water. The proposed irrigation system, therefore, is consistent with the recommendations of the HCGP.

## **Kona Community Development Plan (KCDP)**

The KCDP also identifies diversified agriculture as a major economic sector for the South Kona region. Hawai'i climate and year-round growing season are conducive to agricultural production. Agriculture contributes substantially to the County's economy and produces a variety of goods for export and local consumption. The KCDP identifies the major agricultural industries in Kona as aquaculture, cattle, coffee, forestry, and macadamia nuts. One of the primary strategies for the enhancement of the agricultural industry in Kona focuses on the availability of water. The KCDP supports the need to identify irrigation water sources for the agricultural industry. The proposed irrigation system is therefore also consistent with the recommendations of the KCDP.

### **6.2 Climate and Air Quality**

The climate of the project area is mild and fairly dry due to its location leeward of Mauna Loa. Winds are generally light onshore breezes during the day, replaced by down-slope drainage winds at night. This pattern is occasionally replaced by light and variable southerly "Kona" winds, most often in winter.<sup>5</sup>

Air quality in the area is mostly affected by volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce volcanic smog (vog) that persistently blankets Kona and surrounding areas, including the project area. Human sources of air pollution in this sparsely populated area are minimal.

No impacts to air quality are anticipated under the Proposed Action. Construction-related impacts would be short-term and temporary, and would have a negligible impact on air quality. Emissions would result from generators, construction-related vehicles, and fugitive dust. State of Hawai'i air pollution control rules prohibit visible emissions of fugitive dust from construction activities at the property line. A dust control program will be developed and followed to control dust from construction activities according to the requirements of Hawai'i Administrative Rules (HAR) 11-60.1-33.

The DEIS will address the anticipated impacts to air quality, including short-term impacts due to construction activity, and mitigation to minimize these impacts.

### **6.3 Historic Properties and Traditional Cultural Practices**

#### **Historic Properties**

An archaeological assessment survey of the project area was conducted and a report submitted to the SHPD for review and comment. The assessment included a survey of the well and reservoir sites, and the corridors along which the proposed irrigation lines would be located. The survey confirmed the location of a number of features such as historic and prehistoric boundary walls and habitations, and two sites that are possible burials.<sup>6</sup>

---

<sup>5</sup> University of Hawai'i at Hilo, Department of Geography. 1998 *Atlas of Hawai'i* Third edition, Honolulu: University of Hawai'i Press.

<sup>6</sup> PHRI, September 2006.

SHPD reviewed the report and has determined that a full archaeological inventory survey (AIS) will be necessary.<sup>7</sup> Once the AIS report is completed, it will be submitted to SHPD for review.

The Proposed Action will comply with all final recommendations made by SHPD on how to avoid or minimize impacts to archaeological resources based on the findings of the AIS. For example, although the possible burials are located near the proposed routes of the irrigation lines, the irrigation lines could be routed to avoid them.

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the NRCS will initiate consultation with SHPD and other consulting parties on archaeological resources.

### **Traditional Cultural Practices**

The land in the project area is currently used for agriculture with some areas of unused land and forest reserve. A cultural impact assessment (CIA) study was conducted to evaluate potential cultural resources and determine whether any impacts would result from the Proposed Action. In addition, outreach meetings with many of the stakeholders in the area have been conducted to gather input on the proposed irrigation system and its potential impacts to the land use and the community.

Given the extent of historic period land modification and development, the CIA concluded that it is highly unlikely that any traditional and customary native Hawaiian cultural access and use rights are being exercised within the overall project area. Meetings with the community yielded no additional information to contradict this conclusion. Continued outreach activities will be conducted, including mailings to the community to provide information on the proposed project, and a public hearing after the publication of the DEIS to obtain additional feedback on the project from landowners and other members of the community. Should cultural resources exist in the area that the CIA did not discover, these outreach activities will provide an opportunity for the community to identify them.

Cultural resources will be evaluated in the DEIS, which will address any potential impacts of the Proposed Action and any necessary actions to minimize these impacts.

## **6.4 Flora and Fauna**

### **Flora**

The vegetation within the project area is highly disturbed, as the majority of the land has been cleared and farmed. Much of the project area is under cultivation and consists of managed land vegetation – typically farms, orchards, house sites, lawns, and roads. The exception to this is the South Kona Forest Reserve, approximately 3,000 acres of which is located in the project area. Nearly all of the dominant plants in the locations proposed for irrigation infrastructure under the Proposed Action are alien species of weeds or crop plants.

---

<sup>7</sup> SHPD, May 22, 2009.

A botanical survey was conducted to gather information on the plant species found in the project area and identify any federal or state threatened, endangered, or candidate plant species found therein. Although federal and state-listed species have been encountered and recorded in the project area in the past, none were found during the survey. The DEIS will evaluate the plant resources identified and address potential impacts of the proposed action on such resources, and measures to avoid or minimize those impacts.

## **Fauna**

A terrestrial mammalian and avian survey was conducted to gather information on the mammals and birds found in the project area and identify any federal or state threatened, endangered, or candidate fauna found therein.

The majority of mammalian fauna in the project area, and most of the birds, are alien species. The endangered Hawaiian Hoary Bat is the only mammal indigenous to Hawai'i, and was detected in the project area during the survey. The birds observed in the project area included one species, the Hawaiian Hawk, which is listed as endangered under both federal and the State of Hawai'i's endangered species statutes.

The DEIS will evaluate the fauna identified in this report and address the potential impacts of the proposed action on such resources, and measures to avoid or minimize those impacts. No threatened or endangered species or critical habitat are anticipated to be adversely affected by the Proposed Action

## **6.5 Geology, Topography, and Soils**

Soils in the project area consist of extremely stony or rocky peat (rKED and rPYD), very stony silty clay loam and silt loam (KDD), extremely rocky or stony muck (rKYD and rPXE), and rough broken land (RB).<sup>8</sup>

The agricultural capability classification under the USDA for all these soil types is Group VII. Group VII is defined as "Soils have very severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife," and "s" shows that the soil is limited mainly because it is shallow, droughty, or stony." The additional notation for the specific soil types adds that rPXE is suitable for woodland, pasture, and orchards, and rKYD is suitable for pasture, watershed, coffee and macadamia nuts. Both rPYD and rKED are suitable for pasture.<sup>9</sup>

Geologic conditions do not appear at this time to impose any overriding constraints on the project, and no mitigation measures are expected to be required. However, it is recognized that most of the surface of the island of Hawai'i is subject to eventual lava inundation, and that buildings and infrastructure face risk.

---

<sup>8</sup> United States Department of Agriculture (USDA) Soil Conservation Service and the University of Hawai'i Agricultural Experiment Station *Soil Survey of the Island of Hawai'i, State of Hawai'i*. December 1973. pp. 74-80.

<sup>9</sup> <http://www.ctahr.hawaii.edu/soilsurvey/Hawaii/usemanagesoilmain.htm>

The Proposed Action is not anticipated to have any impact on geology, topography, or soils.

## **6.6 Water Quality, Surface Water, and Ground Water Resources**

Annual rainfall in the project area ranges from 45 to 55 inches per year. The rainfall distribution is predominantly influenced by the rain-shadow effect of Mauna Loa, which shelters much of the project area from the predominant northeast trade winds, and receives approximately equal amounts of rainfall during the summer and winter. Summer rainfall is light and frequent, generated by the sea breeze circulation. During the winter months, rainfall is episodic from high-intensity storms resulting from large-scale atmospheric motion such as the passage of cold fronts or low pressure systems.

The South Kona District has experienced a long-term drought that began in 1982. The drought has intensified and become even more constant during the past decade. During this period, agricultural yields have commensurately decreased. It is theorized that the drought may be caused or exacerbated by the El Nino Southern Oscillation (ENSO) which, in its El Nino (warm) phase, is associated with diminished rainfall and has been dominant for most of the last 20 years. Sulfur dioxide emissions from current eruption of Kilauea which began in 1983 are also theorized to suppress rainfall.<sup>10</sup>

There is no potable water source well or distribution system within the project area. There are two existing wells, one owned by the State (Okoe) and one privately-owned (Kapua), located on the Mac Farms property. They are currently not in use, but were recently used for irrigation and demonstrated increasing salinity when heavily pumped. Agricultural water sources for other farms in the project area have been limited to catchment reservoir systems supplementing natural precipitation during dry periods. Irrigation is predominantly by drip to conserve water. Trucks have provided supplementary water from the terminus of the County of Hawai'i Department of Water Supply water system in Ho'okena at a cost of about \$140 per 4,000-gallon truck.<sup>11</sup>

### **Surface Water**

Because the soils in the region are highly permeable, rainfall moves quickly from the surface into the underlying aquifer, and there are no ponds, lakes, streams, or rivers in the project area.

Excess sediment from soil erosion during and after excavation and construction has the potential to impact water resources if not prevented. The project will comply with the Hawai'i County Code, Chapter 10 – Erosion and Sedimentation Control, the Department of Public Works (DPW) Storm Drainage Standards, and the National Pollutant Discharge Elimination System (NPDES) permit, which will be required during construction to control erosion and prevent discharge of sediment from the project area. Construction activities will include the implementation of Best Management Practices (BMPs) to control erosion and sedimentation from the project area. Based upon the regulation requirements and implementation of BMPs, short-

---

<sup>10</sup> U.S. Geological Survey, October 2001

<sup>11</sup> Bowen, Dr. Richard, and Dr. Kent Fleming, December 2003, p.5.

term impacts resulting from grading and other construction operations are anticipated to be insignificant and appropriately mitigated.

### **Groundwater**

Because the Proposed Action will draw water from the aquifer, the system must be sized such that groundwater would not be negatively impacted by exceeding the maximum sustainable yield. Although the aquifer is expected to produce fresh water at the 2,600-foot elevation, increased salinity indicative of saltwater intrusion to the aquifer has been reported at wells at lower elevations when pumping at high rates. The report on groundwater resources prepared for the DEIS estimated the maximum sustainable yield of the aquifer at a lower elevation of 1,700 feet would be about 3 MGD per mile, and more at the higher elevations.<sup>12</sup>

The DEIS will address the findings of the report, including the recommended pumping rates, the projected maximum sustainable yield of the aquifer, any anticipated impacts to groundwater, and any measures necessary to minimize these impacts.

## **6.7 Marine Environment**

The project area is located a considerable distance from the ocean (1.2 miles at its closest point; 6 miles at its furthest) and is not expected to have an impact on a marine environment. The project will require a federal consistency determination from the DBEDT Office of Planning, Coastal Zone Management Program.

## **6.8 Noise**

Noise levels in the project area are currently low and are mainly from farming activities, residences, and Mamalahoa Highway. Few highly sensitive noise receptors such as residences, schools, or parks are present.

Well drilling and reservoir construction may elevate noise levels during short periods over the course of several months. The Department of Health (DOH) will be consulted, and if appropriate, the contractor will be required to obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH would review the proposed activity, location, equipment, project purpose, and timetable, and decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers.

In addition to potential temporary noise elevation due to construction activities, the DEIS will also address potential noise produced from daily operations of the irrigation system.

## **6.9 Hazardous Materials and Waste**

Generation of hazardous materials or wastes is expected to be minimal. All generation and waste disposal will be in accordance with applicable federal and state regulations.

---

<sup>12</sup> Waimea Water Services, p. 16.

## 6.10 Public Services, Facilities, Utilities, and Traffic

Electrical power will be required to operate components of the irrigation system. The estimated electricity consumption for the system ranges from \$2.0 million per year to \$3.3 million per year, depending on the elevation of the wells and the extent of the build-out. Electricity prices have fluctuated significantly in the last few years. These costs are based on 2008 estimates. The DEIS will provide additional information on the expected electrical demand of the system and any impacts it may have on existing generation capacity on the island of Hawai'i.

The irrigation system will be routed along Mamalahoa Highway and other roads wherever possible. Short-term, temporary impacts to traffic may occur during construction. No long-term impacts to roads and traffic are anticipated.

The Proposed Action may result in the availability of a local water source for fire suppression. No other impacts to sewers, landfills, emergency services, schools, or other public services or infrastructure are anticipated.

## 6.11 Visual Resources

Views to and from the project area are dominated by agricultural land, including scattered low-rise farm buildings and houses. The Proposed Action will not involve the construction of buildings, and the proposed reservoirs, wells, and pipelines are not expected to be visually obtrusive or significantly change the views in the area.

## 6.12 Natural Hazards

The entire island of Hawai'i is subject to geologic hazards, especially lava flows and earthquakes.

### Lava

The project area is located in Lava Flow Hazard Zone 2<sup>13</sup> (second highest on a scale of 1-9, with 1 being highest). Approximately 75 percent of the land in the project area has been covered by lava in the last 750 years, 20 percent since 1800. Some small parts of the project area are covered with lava from the flows of 1916 and 1926.<sup>14</sup> As such, with Mauna Loa continuing to be in its active phase, there is at least some risk of short-term future volcanism producing lava flows that cross the project area.

### Earthquakes

The Uniform Building Code (UBC) seismic provisions contain six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval). All of Hawai'i County is located in Zone 4. Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built, as the 6.7-magnitude earthquake of October 15, 2006, demonstrated.

---

<sup>13</sup> <http://pubs.usgs.gov/gip/hazards/maps.html>

<sup>14</sup> <http://pubs.usgs.gov/gip/hazards/mauna-loa.html>

In general, geologic conditions do not appear at this time to impose any overriding constraints on the project. Earthquake hazards in the project area are no greater or less than in any other part of the island. HAR Title 13, Chapter 190 “Dams and Reservoirs” requires that the construction of all dams and reservoirs in excess 15 acre-feet (4.9 million gallons) capacity obtain a permit from the DLNR Board of Natural Resources, and be subject to safety inspections, unless the structure is located underground, or its failure is not expected to result in the loss of human life.

### **Wildfires**

The project area is subject to wildfires during periods of low rainfall. With expansive acreage in native and planted forest, pasture and orchard crops, drought presents a real risk to both native species and croplands. While the components of the proposed irrigation system would be at little risk of damage from wildfires, the system’s reservoirs may prove helpful to firefighting units, who would otherwise have to truck or fly in their own water, and would provide landowners with an immediate supply of water to suppress blazes before they got out of control.

### **Floodplains**

No surface water bodies such as streams or lakes exist in the area, and no wetlands are present. The project area is designated Zone X on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the region. Zone X is defined as “Areas determined to be outside the 500-year flood plain.” The project will not add a significant amount of impermeable surface to the region, and thus would not influence the likelihood of flooding.

The DEIS will address the risks to the project area from lava, earthquakes, and other natural hazards.

## **6.13 Socio-Economic and Community Conditions**

According to the U.S. Census Bureau, the population of South Kona in 2000 was 8,589. The top two most common industries for males were construction (19 percent) and agriculture, forestry, fishing, and hunting (18 percent). The top four most common industries for females were educational services (14 percent); accommodation and food services (13 percent); health care (10 percent); and agriculture, forestry, fishing, and hunting (6 percent).<sup>15</sup>

Residents and farmers in South Kona currently rely on water catchment systems and trucked water. Due to low rainfall in the District, catchment systems have become increasingly unreliable. In March 2004, the County of Hawai’i completed a Ka’u to South Kona Water Master Plan draft report. During the process of completing the report, meetings were held with various members of the community. Participants from community associations, farmers, social service agencies, government, and other area residents provided key insights on water issues. Issues raised included fire protection,

---

<sup>15</sup> <http://www.usaelectionpolls.com/cities/Hawaii/South-Kona.html>

lava hazards, public health, education, droughts, regional agricultural and economic potential, and community values.

The report concluded that: “Over 70 percent of agricultural lands in Ka’u and South Kona are not cultivated because of water constraints,” and that “Existing farming is economically marginal because of drought conditions. The agricultural industry would grow and benefit the region with the availability of water.”<sup>16</sup>

Although there has been an increase in rainfall within the past few years, an irrigation system will still be beneficial for the South Kona District in the longer term. According to the Ka’u to South Kona Water Plan, many farmers had expressed how access to water sources could assure that agricultural lands remain in use. Many believe that without additional water, farming in the area would become more economically marginal. The availability of water could increase farming, create more jobs, sustain agriculture, and relieve the pressure on the rural/agricultural lifestyle in the South Kona District. For this reason, there is broad community support for an irrigation system.

The DEIS will evaluate various socio-economic issues and provide determinations on impacts, if any.

## 7 DISCUSSION OF SIGNIFICANCE CRITERIA

While this EISPN is preliminary to the DEIS, the currently known information presented here has been evaluated according to the significance criteria as set forth in HAR, Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 200. As a result of this preliminary information, it is anticipated that the proposed irrigation system:

1. Is not likely to involve an irrevocable commitment to loss or destruction of any natural or cultural resources;
2. Will increase the range of beneficial uses of the environment;
3. Will not conflict with the State’s long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;
4. May substantially and positively affect the economic or social welfare of the community or state;
5. Will not substantially affect public health;
6. May involve secondary impacts, such as population changes or effects on public facilities;
7. Is not likely to involve a substantial degradation of environmental quality;
8. Is individually limited but cumulatively may have a considerable effect upon the environment or involves a commitment for larger actions;
9. Is not anticipated to substantially affect a rare, threatened, or endangered species, or its habitat;

---

<sup>16</sup> [http://www.co.hawaii.hi.us/info/projectsarchive/k2skwmp/drafttrpt/WMPDraftReport\\_4.Community.pdf](http://www.co.hawaii.hi.us/info/projectsarchive/k2skwmp/drafttrpt/WMPDraftReport_4.Community.pdf)

10. Will not detrimentally affect air or water quality or ambient noise levels;
11. Will not affect, or be likely to suffer damage by being located within an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;
12. Will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies; or
13. Will result in additional energy consumption.

## **8 ANTICIPATED DETERMINATION**

During the early scoping process it was determined that there may be sufficient controversy about whether the project has the potential to cause significant impacts to the environment and that an Environmental Impact Statement an EIS would be needed for the evaluation of the Proposed Action and Alternatives. Pursuant to Chapter 343, HRS, the preparation of the DEIS is being undertaken.

## **9 ANITICIPATED PERMITS AND APPROVALS NEEDED**

The following permits and approvals may be required for some phases of the Proposed Action:

A NPDES permit from the DOH for storm water discharges related to construction activities.

A noise permit from the DOH for construction-related activities that exceed State maximum permissible sound levels.

Well construction permits from the DLNR Commission on Water Resource Management.

Well completion reports to the DLNR Commission on Water Resource Management.

Reservoir construction permit from the DLNR Board of Natural Resources (if reservoir capacity is in excess of 15 acre-feet and failure is expected to lead to loss of human life).

Conservation District use permit from the DLNR.

Coastal Zone Management Consistency Determination from the DBEDT Office of Planning.

Grubbing and Grading permit from the County of Hawai'i Department of Public Works.

## **10 REFERENCES**

Belt Collins Hawaii Ltd., with R. Bowen and K. Fleming. June 2008.  
*Benefit/Cost Analysis for South Kona Watershed Irrigation System, Preliminary Feasibility Study.* Prepared for U.S. Department of Agriculture

- Natural Resources Conservation Service, and State of Hawai'i Department of Agriculture.
- Belt Collins Hawaii Ltd., with R. Bowen and K. Fleming. February 2007. *Benefit/Cost Analysis for South Kona Watershed Irrigation System, Preliminary Feasibility Study*. Prepared for U.S. Department of Agriculture Natural Resources Conservation Service, and State of Hawai'i Department of Agriculture.
- Belt Collins Hawaii Ltd., with R. Bowen and K. Fleming. December 2003. *South Kona Irrigation System: Preliminary Feasibility Study*. Prepared for U.S. Department of Agriculture Natural Resources Conservation Service, and State of Hawai'i Department of Agriculture.
- County of Hawai'i. March 2004. *Ka'u to South Kona Water Master Plan. Draft Report*.
- County of Hawai'i. "County of Hawai'i General Plan 2005." <http://www.hawaii-county.com/la/gp/2005/main.html>. Last accessed May 19, 2009.
- Isle Botanica. October 2006. *Botanical Survey of the Proposed South Kona Watershed Irrigation Project*. Report prepared for Belt Collins Hawaii Ltd.
- Juvik, Sonia P. and James O. Juvik. 1998. *Atlas of Hawai'i, Third Edition*. University of Hawai'i at Hilo, University of Hawai'i Press.
- Megumi Kon, Inc., December 1989. *Hawai'i County Water Use and Development Plan*. Prepared for Department of Water Supply County of Hawai'i.
- PHRI. September 2006. *Archaeological Assessment Survey and Cultural Impact Assessment Study, South Kona Irrigation System Project*. Prepared for Belt Collins Hawaii Ltd.
- State Historic Preservation Division. May 22, 2009. *National Historic Preservation Review (NHPA) Section 106 Review – Section 106 Historic Preservation Review Request for the South Kona Watershed Irrigation System Project. Papa 1st and 2nd, Anapuka, Ho'opuola, Miloli'i, Omoka'a, Kalihi & Honomalino TMK (3) 8-9 (var.)*.
- State of Hawai'i, United States Department of Agriculture Soil Conservation Service and the University of Hawai'i Agricultural Experiment Station. December 1973. *Soil Survey of the Island of Hawai'i*.
- RANA Productions Ltd., September 2006. *A Survey of Avian and Terrestrial Mammalian Species, South Kona District, Island of Hawai'i*. Prepared for Belt Collins Hawaii Ltd.
- U.S. Geological Survey. October 25, 2001. "Long Lived Eruptions May Contribute to Local Droughts." [http://hvo.wr.usgs.gov/volcanowatch/2001/01\\_10\\_25.html](http://hvo.wr.usgs.gov/volcanowatch/2001/01_10_25.html). Last accessed June 16, 2009.
- U.S. Geological Survey. "Lava Flow Hazard Zone Maps." <http://pubs.usgs.gov/gip/hazards/maps.html>. Last accessed May 14, 2009.

- U.S. Geological Survey. "Mauna Loa Hazard Zones."  
<http://pubs.usgs.gov/gip/hazards/mauna-loa.html>. Last accessed May 14, 2009.
- University of Hawai'i Geography Department. 1983. *Atlas of Hawai'i. Second edition*. Honolulu, University of Hawai'i Press. Armstrong, R.W. (editor).
- University of Hawai'i College of Tropical Agriculture and Human Resources (CTAHR). "Soil Survey of Hawai'i"  
<http://www.ctahr.hawaii.edu/soilsurvey/Hawaii/usemanagesoilmain.htm>  
last accessed July 1, 2009.
- Waimea Water Services Inc., November 2005. *The Ground-water Resources of Honomalino and Vicinity*. Prepared for Belt Collins Hawaii Ltd.
- Water Resource Associates. December 2003 (revised: December 2004). *Agricultural Water Use and Development Plan*. Prepared for Department of Agriculture State of Hawai'i.
- Wilson Okimoto Corp. *Kona Community Development Plan*. Adopted as Hawai'i County Ordinance #08-131 on September 25, 2008.  
<http://www.hcrc.info/community-planning/community-development-plans/kona/cdp-final-drafts/>. Last accessed May 19, 2009.