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GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. PM-1214.9

NOV 10 1999

OFFICE OF
QUALITY CONTROL

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RECEIVED

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

Dear Ms. Salmonson:

Subject: Final Environmental Assessment/Finding
of No Significant Impact
Kulani Correctional Facility
Water System Improvements
D.A.G.S. Job No. 11-27-5525
TMK: 2-4-8:09, South Hilo, Hawaii, Hawaii

The State Department of Accounting and General Services has reviewed the comment letters received during the public review period and has determined that the project qualifies as a Finding of No Significant Impact (FONSI). Please publish notice of this in the November 23, 1999, issue of your *Environmental Notice*.

We have enclosed a completed OEQC *Environmental Notice* Publication Form, the project description and four copies of the Final EA/FONSI. Should you have any questions or require additional information regarding this, please contact David Chung at 586-0464.

Very truly yours,

GORDON MATSUOKA
Public Works Administrator

DC/si
Encl.
c: Fujita & Associates, Inc.

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FILE COPY

~~K~~ulani Correctional Facility
Water System Improvements~~*~~
Waiakea, South Hilo, Hawaii

Final Environmental Assessment

Proposing Agency:
Department of Accounting and General Services

November 1999

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 BY DR. JAMES JACOBI

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SECTION 1

INTRODUCTION

SECTION 1 INTRODUCTION

1.1 BACKGROUND

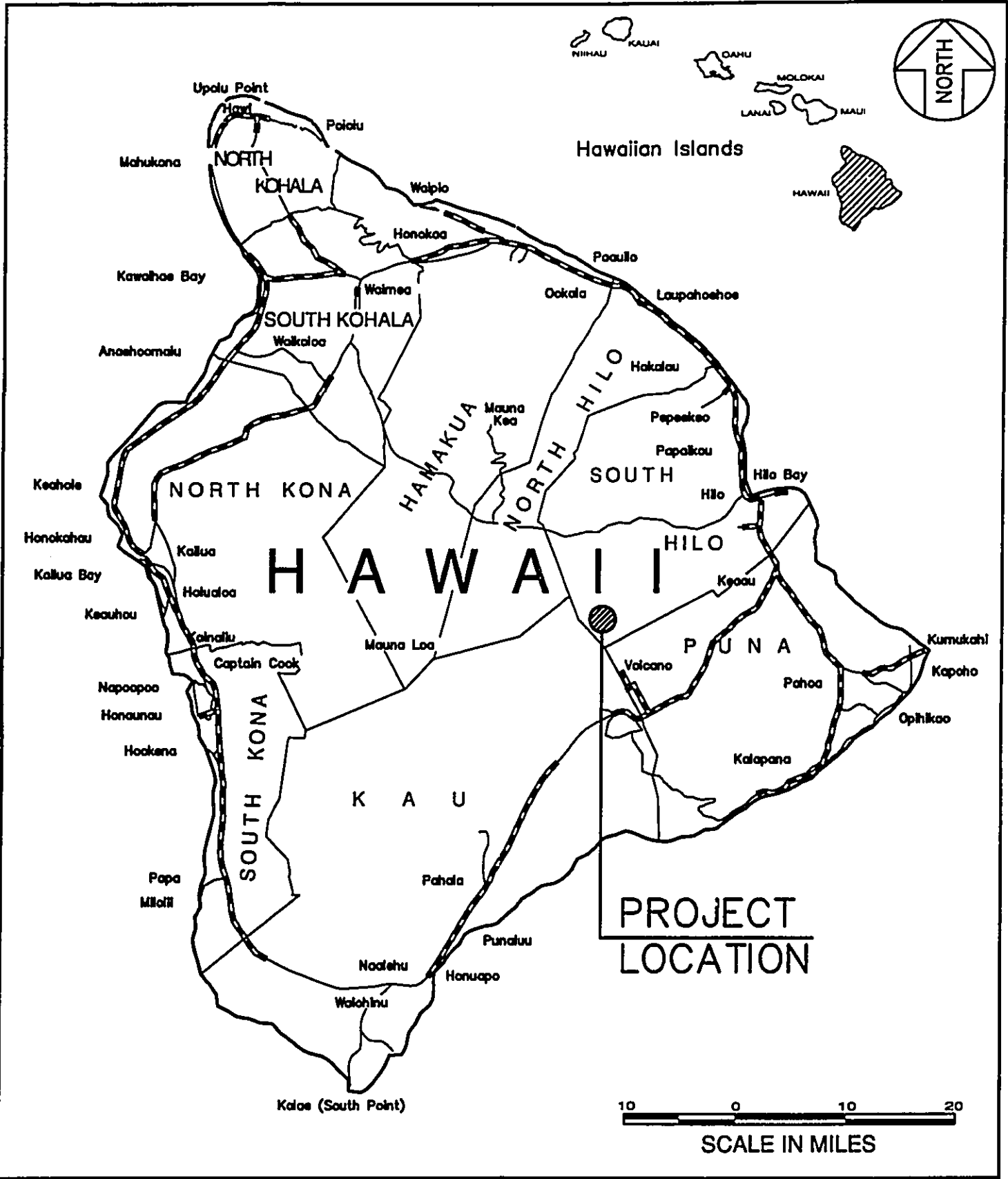
The State of Hawaii, Department of Public Safety operates the Kulani Correctional Facility (KCF), a low security facility, which is located on the windward slopes of Mauna Loa, on the island of Hawaii, as shown in Figure 1-1. KCF is located in the South Hilo District approximately 20 miles from Hilo where South Hilo meets the Puna and Kau Districts. Figure 1-2 shows KCF in relation to Hilo. Access to the facility is via Stainback Highway, a two-lane paved road.

The facility is situated within the Upper Waiakea Forest Reserve at an elevation close to 5,180 feet above mean sea level. The entire facility boundary encompasses approximately 7,244 acres of State conservation land with elevations ranging from 4,620 feet to 6,200 feet. Figure 1-3 shows the facility boundary and its relationship to the district boundaries and the nearby national park. Of the 7,244 acres, roughly 25 acres are actively used. The main camp area of the facility consists of the administration building, the kitchen and mess hall, a laundry facility, a sawmill which is not in operation, a repair shop building, a gymnasium, a woodwork shop, a crafts display/visiting building, seven dormitories, and several miscellaneous sheds. Because of its remote location, KCF is not serviced by the County of Hawaii's Department of Water Supply. Instead, KCF relies on diversion and catchment systems for its water supply.

The domestic water system at KCF was originally constructed in the 1950's, and was improved in 1987. The improved and current system includes:

- a five-acre, polyethylene-lined raw water catchment area, which includes a five-million-gallon, polyethylene-lined earthen raw water reservoir;
- a package type water treatment facility which consists of a 100 gpm gravity sand filter and a chlorination system;
- a 300,000-gallon glass-coated steel, finished water storage reservoir;
- approximately 3,000 feet of 12-inch ductile iron water main, which transports the water to the main camp; and
- an 8-inch ductile iron pipe distribution system within the camp.

Figure 1-4 shows most of these improvements as well as the proposed project site.

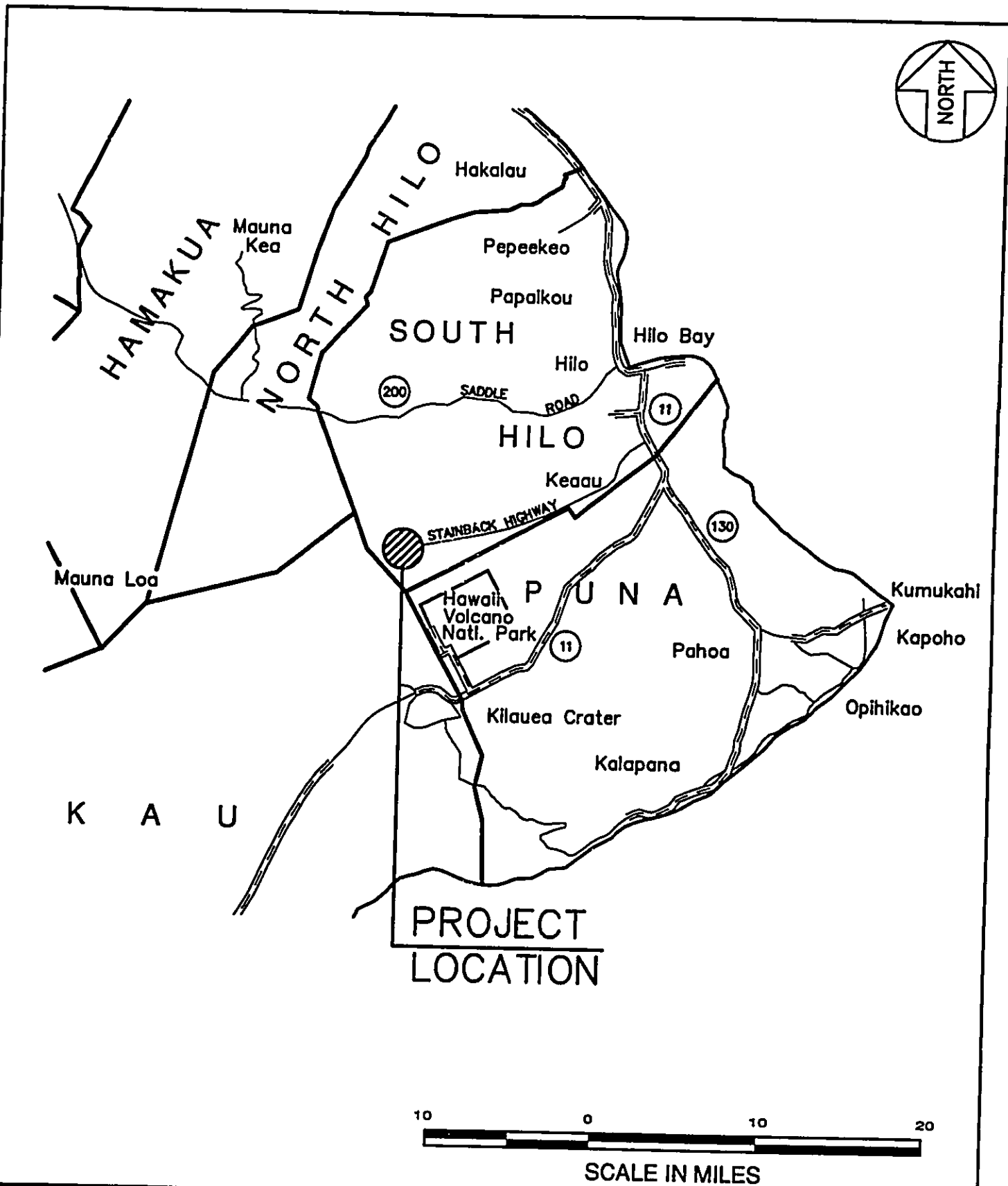


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FIGURE 1-1
 ISLAND MAP

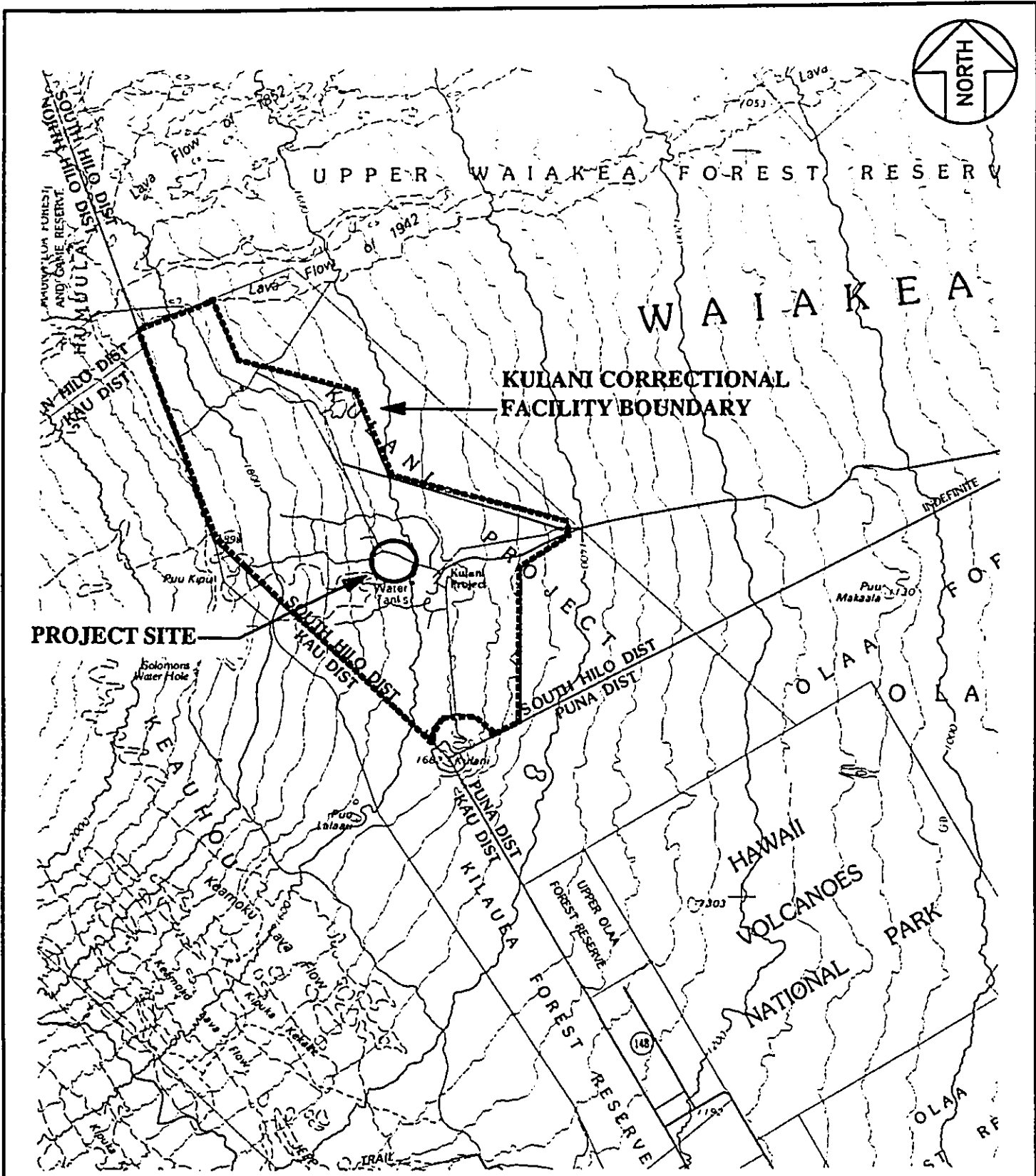
KULANI CORRECTIONAL FACILITY
 WATER SYSTEM IMPROVEMENTS
 WAIAKEA, SOUTH HILO, HAWAII



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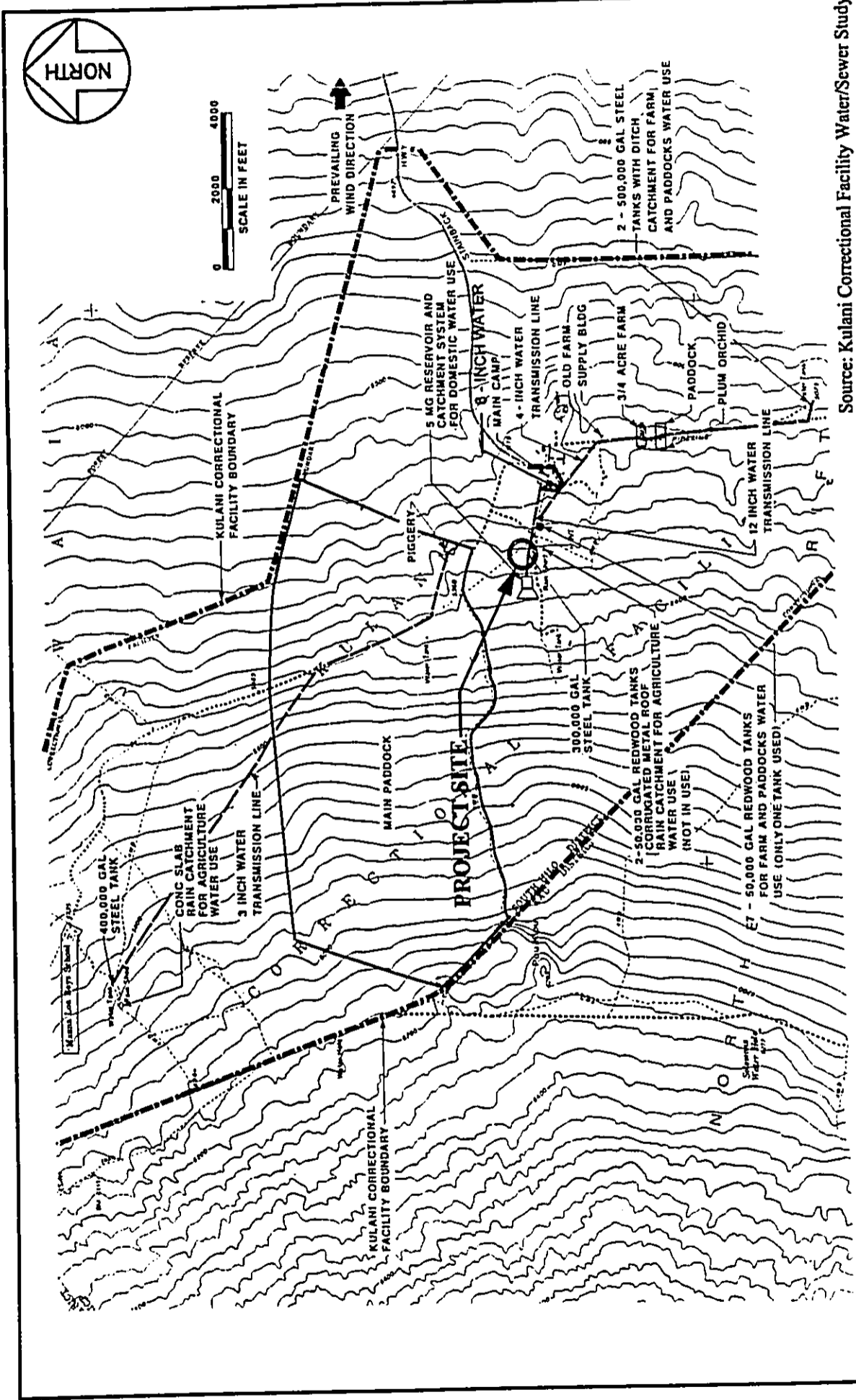
FIGURE 1-2
 LOCATION MAP

KULANI CORRECTIONAL FACILITY
 WATER SYSTEM IMPROVEMENTS
 WAIAKEA, SOUTH HILO, HAWAII



CONTOUR INTERVAL IS 40 METERS

| | | |
|--|--|---|
| <p>Prepared By: Fujita & Associates, Inc. 765 Amana Street, Suite 201 Honolulu, Hawaii 96814</p> | <p>FIGURE 1-3 FACILITY BOUNDARY MAP</p> | <p>KULANI CORRECTIONAL FACILITY WATER SYSTEM IMPROVEMENTS WAIAKEA, SOUTH HILO, HAWAII</p> |
|--|--|---|



Source: Kulani Correctional Facility Water/Sewer Study
Barret Consulting Group, April 1991

**KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII**

**FIGURE 1-4
FACILITY MAP**

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When the required 240,000 gallons are stored in the 300,000-gallon reservoir, the system is capable of providing the minimum fire flow of 2,000 gallons per minute (gpm) for two hours with a residual pressure of 20 pounds per square inch (psi) at any point in the main camp's distribution system. When the storage falls short of the 240,000 gallons, fire flow capabilities are decreased.

1.2 PURPOSE AND NEED

In 1991, a report was completed by Barrett Consulting Group (Barrett) to study and analyze the existing water system and to recommend improvements to accommodate future needs. The following paragraphs summarize Barrett's report.

In 1990, the population at KCF was 160 inmates and 80 staff. The 1990 average daily demand for domestic water was estimated to be 22,000 gallons per day (gpd). The projected average daily demand for the year 2000 was estimated to be 60,500 gpd. Even with the improvements made in 1987, some water hauling was required to make up for the shortfall during the periods of minimal rainfall or drought. Table 1.1 is a tabulation of the volume of water hauled to KCF from 1976-1998.

To meet KCF's future needs, Barrett recommended that the total catchment area be increased to 15.5 acres from the existing 5 acres, an increase of 10.5 acres. The catchment system would connect to and extend above the existing catchment area. Water would flow by gravity to the existing open reservoir and subsequently to the water treatment plant. At the request of the KCF and the Department of Public Safety, a new 500,000-gallon glass coated steel reservoir was also included as one of the recommended improvements.

1.3 PROJECT DESCRIPTION

In accordance with Barrett's report, the Department of Public Safety is proposing to construct some of the needed improvements, namely to construct a new 600,000-gallon steel reservoir and needed appurtenances and to install a "Hypalon" cover over the existing open reservoir. No improvements to the treatment plant or to the main transmission system are proposed.

1.3.1 Proposed Action

The new 600,000-gallon reservoir will be located near the existing 300,000-gallon reservoir, as shown in Figure 1-5. This will yield a total finished water storage capacity of approximately 0.9 million gallons (mg). The increase in storage capacity should decrease the amount of water hauled to the facility and will also increase reliability of service during a fire. In essence, when rainfall is high, the additional storage capacity will be able to sustain the facility for a longer period, possibly until the next rainfall. The new "Hypalon" cover will also help to provide

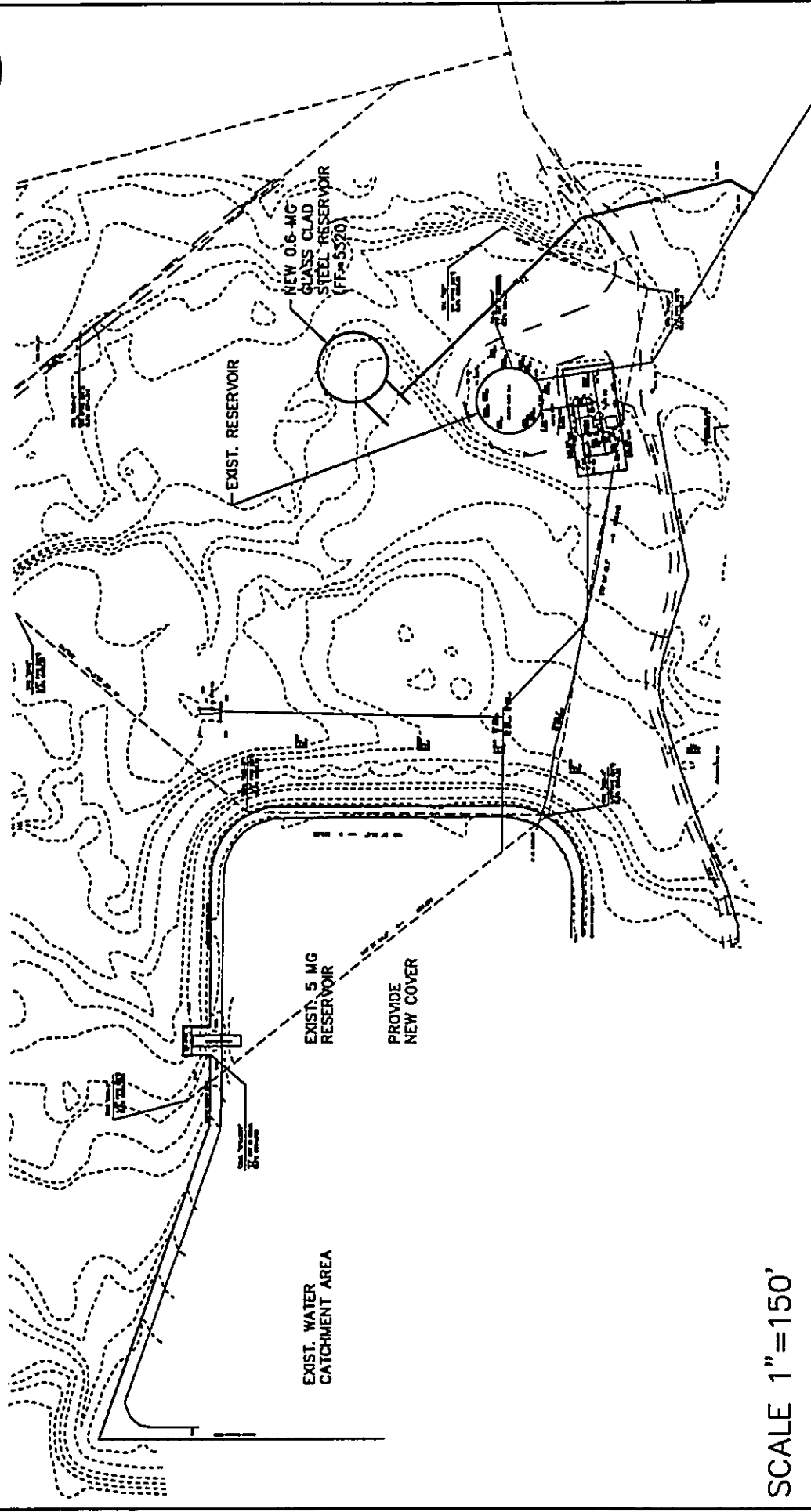
**TABLE 1.1
WATER HAULED TO KCF
1976-1998**

| <u>Year</u> | <u>Volume Hauled (Gallons)</u> | <u>Estimated Cost</u> |
|-------------|--------------------------------|-----------------------|
| 1976 | 519,500 | \$21,940.00 |
| 1977 | 207,000 | \$8,740.00 |
| 1978 | 537,000 | \$22,680.00 |
| 1979 | 1,086,000 | \$45,860.00 |
| 1980 | 447,000 | \$18,880.00 |
| 1981 | 2,364,000 | \$99,830.00 |
| 1982 | 23,000 | \$970.00 |
| 1983 | 591,500 | \$24,980.00 |
| 1984 | 1,932,000 | \$76,510.00 |
| 1985 | 2,880,000 | \$123,790.00 |
| 1986 | 2,646,000 | \$117,060.00 |
| 1987 | 288,000 | \$14,300.00 |
| 1988 | 0 | \$0.00 |
| 1989 | 180,000 | \$1,418.00 |
| 1990 | 0 | \$0.00 |
| 1991 | 1,822,900 | \$47,144.30 |
| 1992 | 7,815,700 | \$198,322.77 |
| 1993 | 7,253,600 | \$176,604.93 |
| 1994 | 2,726,400 | \$67,381.90 |
| 1995 | 5,093,900 | \$195,257.56 |
| 1996 | 2,933,200 | \$112,582.44 |
| 1997 | 493,900 | \$18,956.92 |
| 1998 | 1,760,000 | \$21,120.00 |

Notes:

1. Water hauling cost from Hilo was \$0.042 per gallon, cost provided by KCF. This is for contracted water hauling from 1976 to 1987.
2. Water hauling during 1989 was performed by KCF. Cost for water hauling was \$0.0079 per gallon, cost provided by KCF. KCF has no record on fuel cost and KCF was not charged for the water.

SOURCE: KULANI CORRECTIONAL FACILITY WATER/SEWER STUDY, APRIL 1991
AND KULANI CORRECTIONAL FACILITY STAFF



SCALE 1"=150'

KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII

FIGURE 1-5
SITE PLAN

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additional water by decreasing evaporation. In addition, the cover will help to keep unwanted animals and particulates from getting into the raw water reservoir.

Water will flow from the existing catchment area to the existing open raw water reservoir and then to the water treatment facility. The filtered and chlorinated water will then be pumped into one of the two storage reservoirs. The finished floor elevation of the existing reservoir is 5,325 feet, while the new reservoir's finished floor elevation will be 5,320 feet.

The area to be used for the reservoir was previously cleared and partially graded in anticipation of this expansion.

1.3.2 Probable Schedule and Cost

Construction is expected to commence in mid-2000, and is expected to last for four months. Construction should take place during the dry season to reduce the potential for runoff and erosion. The cost to construct the improvements was estimated in 1999 to be \$1.3 million.

1.3.3 Applicable Permits and Approvals

The following permits and approvals are anticipated for this project:

- State Department of Land and Natural Resources, Office of Conservation and Environmental Affairs, Conservation District Use Permit; and
- State Department of Health, Safe Drinking Water Branch, Approval under HAR11-20, Rules Relating to Potable Water Systems

1.4 PROPOSING/APPROVING AGENCY

The proposing and approving agency is the Department of Accounting and General Services.

SECTION 2

ALTERNATIVES TO THE PROPOSED ACTION

SECTION 2 ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the proposed action include hauling additional water to meet KCF's future needs, alternative sites for the reservoir, delaying the proposed action until a later time, and no action.

2.1 HAULING ADDITIONAL WATER

The alternative of hauling additional water to KCF is a feasible one. However, the intent of this project is to reduce the amount of water hauled to the facility, and to help make the facility less dependent upon the County's water. Although the Department of Water Supply has not been charging KCF for the water, manpower and fuel costs have been a major operational expense for KCF, as shown in Table 1.1. For these reasons, this alternative is not feasible.

2.2 ALTERNATIVE SITES

The new reservoir site was chosen based on the following criteria: spillway elevation, proximity to the water treatment facility, and whether or not the area had been previously cleared. Ideally, the spillway elevation of the new reservoir will be the same elevation as the existing reservoir. This will assure that the water going into the distribution system from both reservoirs has the same pressure. Since the spillway elevation is set, the finish floor elevation can be determined based on the dimensions of the reservoir.

Proximity to the treatment facility will determine the amount of piping needed. The closer the reservoir, the less piping will be required.

Whether or not the area had been previously cleared is important when considering the possible existence of endangered or threatened flora and fauna species which have been found within the forest environment of KCF. If the area has been cleared, chances of finding any endangered or threatened fauna species are greatly reduced.

Based on the criteria mentioned above, the reservoir was sited next to the existing reservoir within an area that was previously cleared.

2.3 DELAYED ACTION

A delayed action alternative would only burden the facility with the possibility of hauling additional water during times of drought or minimal rainfall. In addition, delaying the project may increase construction costs as material and labor costs may increase. This option will only worsen the situation, and is therefore not feasible.

2.4 NO ACTION

A no action alternative is similar to Section 2.1 Hauling Additional Water. Records have shown that water has been continuously hauled to the facility even after the 1987 improvements. If nothing is done to improve the water system, water will continue to be hauled and reliability of water service in the event of a fire may be compromised. This alternative does not meet the objectives of the project and is therefore considered to be infeasible.

SECTION 3

EXISTING CONDITIONS

SECTION 3 EXISTING CONDITIONS

The Kulani Correctional Facility, a State operation, is located on the eastern slopes of Mauna Loa, on the island of Hawaii. The existing conditions at the project site are described in the following sections.

3.1 EXISTING LAND USE

The boundaries of the 7,244 acres that make up the KCF were created by Governor's Executive Order Numbers 1124 and 1588. The land is situated within the Upper Waiakea Forest Reserve where the State Land Use Designation for the land is Conservation. Most of the 7,244 acres are within the Resource Subzone, but the main camp and this project site are located within the General Subzone, as shown in Figure 3-1. A Conservation District Use Permit from the Department of Land and Natural Resources, Office of Conservation and Environmental Affairs will be required to construct the water system improvements.

Besides the activities of the main camp, portions of the facility are used for cattle grazing, pig breeding, and some agricultural activities.

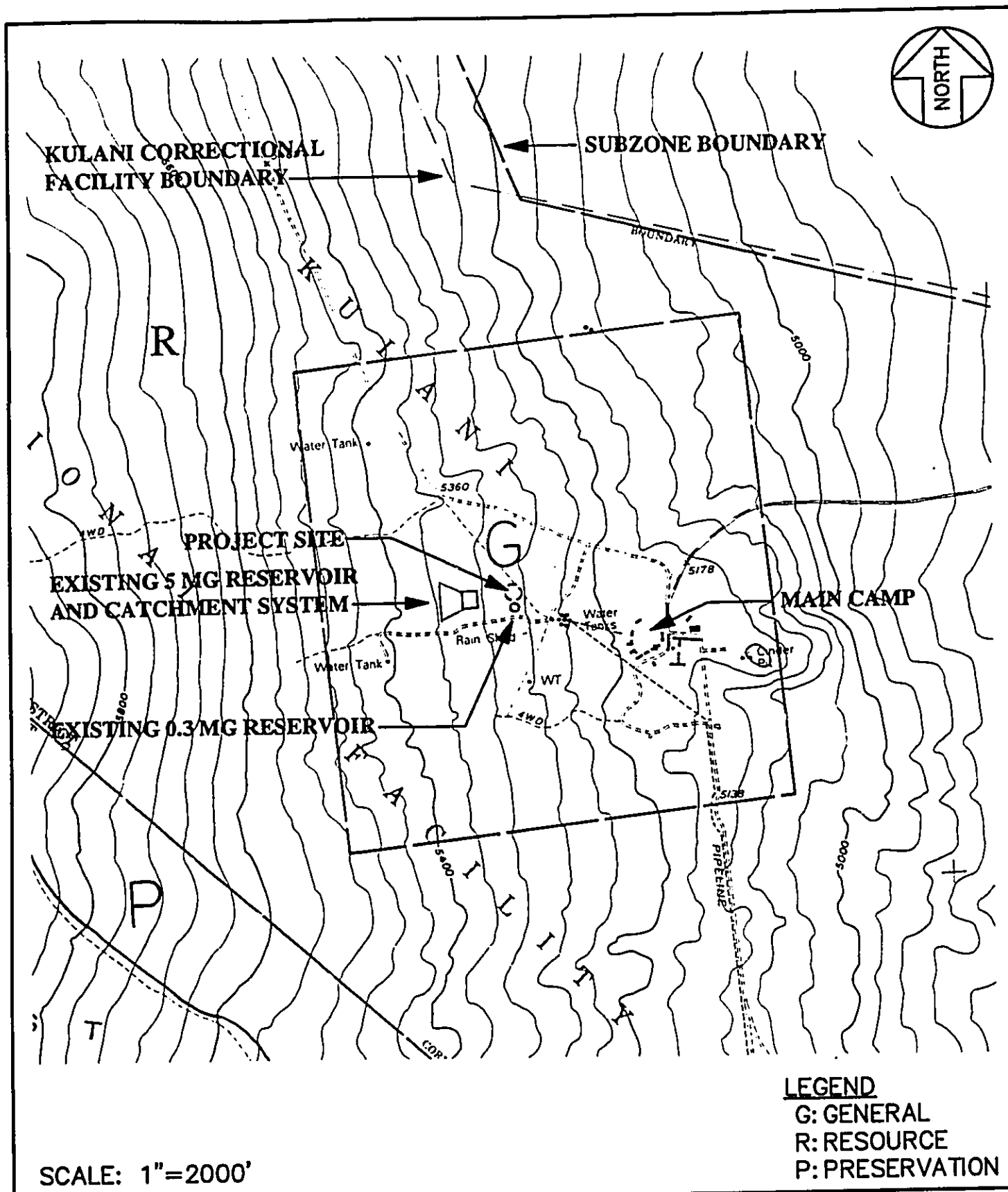
3.2 SURROUNDING LAND USE

The Upper Waiakea Forest Reserve is located to the north and east of KCF, while the O'laa Forest Reserve and the Hawaii Volcanoes National Park are located to the south. The area of Keauhou is located to the west of KCF. All of the surrounding land is within the State Conservation District which is regulated by HAR 13-5 Conservation District.

3.3 CLIMATE

Hawaii's climate can be described as having mild temperatures all year round, moderate humidity, a persistent north-easterly trade wind, differences in rainfall within short distances, and infrequent severe storms. This mild weather can be attributed to the fact that Hawaii is located well within the tropics.

The island of Hawaii is the most southeastern and largest of the Hawaiian archipelago, encompassing roughly 4,038 square miles, or nearly 2/3 of the land area of the State of Hawaii. Its highest peak is Mauna Kea, which rises 13,796 feet above mean sea level. The size of the island and the range of elevation, from sea level to more than 2-1/2 miles above sea level, contribute to a diverse climate.



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**FIGURE 3-1
 CONSERVATION DISTRICT
 SUBZONE MAP**

**KULANI CORRECTIONAL FACILITY
 WATER SYSTEM IMPROVEMENTS
 WAIAKEA, SOUTH HILO, HAWAII**

Temperatures on the island of Hawaii range from highs of 80°F along the coast, to lows in the 20's at the summit of Mauna Kea. At KCF, the highs are in the 60's and the lows in the 40's (Department of Geography, University of Hawaii, 1983).

Most of the island's rainfall is due to orographic or mountain-caused rains which form within the moist trade wind air as it moves up along the mountainside. Rainfall reaches a maximum at around 2,000 to 3,000 feet above sea level, and decreases rapidly with higher elevations, leaving the highest slopes fairly dry. The district of South Hilo has some of the wettest spots on the island with annual average rainfall of 300 inches. As shown in Figure 3-2, rainfall at the facility averages around 100 inches per year, and as the elevations increase toward Mauna Loa, annual rainfall decreases to less than 15 inches.

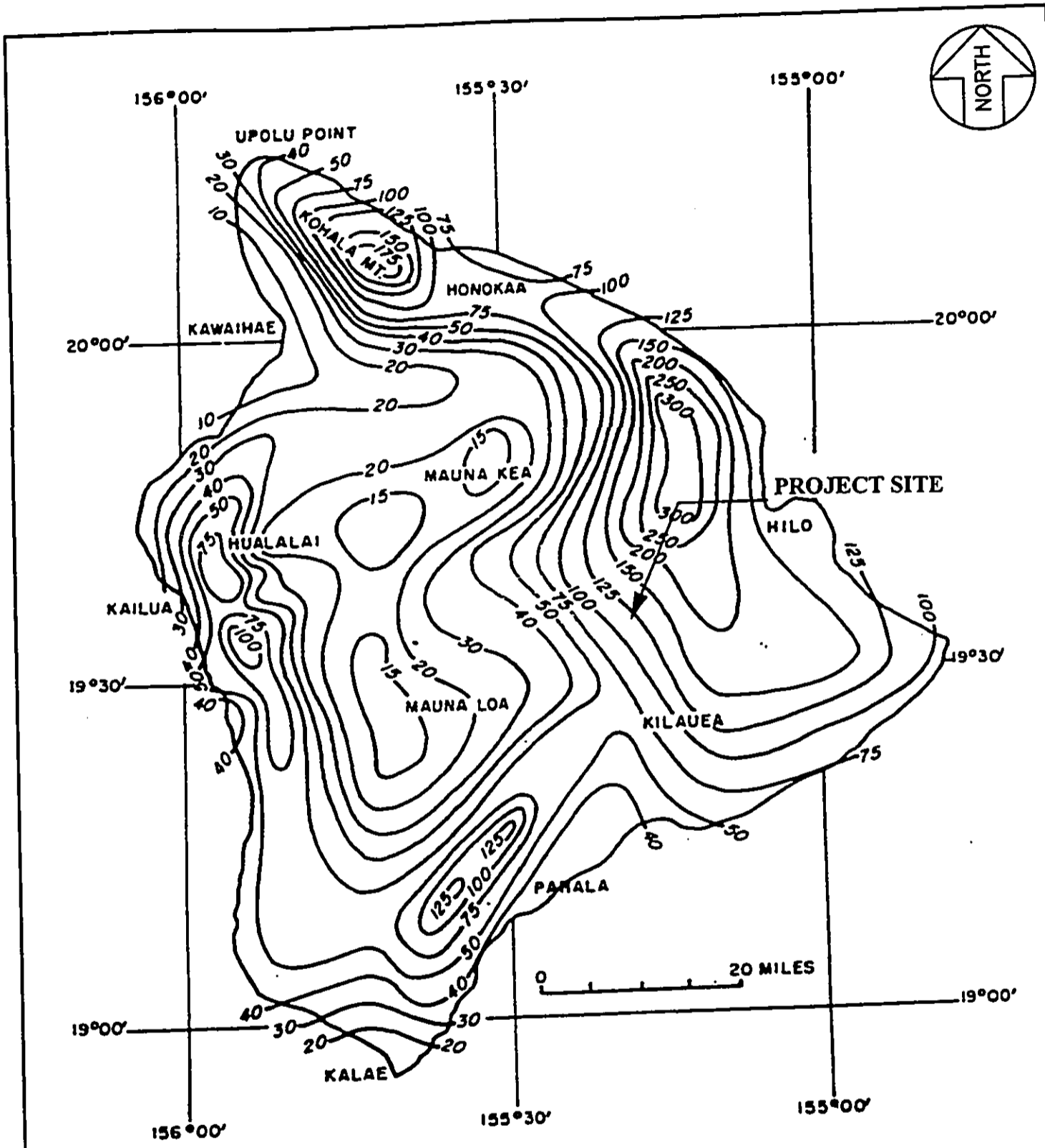
3.4 GEOLOGY AND TOPOGRAPHY

Geologically speaking, the island of Hawaii is the youngest of the Hawaiian islands. Rocks from its oldest volcano indicate that the island is about 700,000 years old, compared to Kauai which is over 3,000,000 years old (Commission on Water Resource Management, 1992). The following five large shield volcanoes make up the island of Hawaii, Kohala, Mauna Kea, Mauna Loa, Hualalai, and Kilauea. Kohala is considered extinct. Mauna Kea and Hualalai are considered to be dormant. Mauna Loa and Kilauea are active. Volcanic activity of the Hawaiian volcanoes is described as "gentle eruptions of very fluid lava containing little gas" (Department of Geography, University of Hawaii, 1983). The result is permeable, thin, basaltic lava flows, that yield topography which can be described as gently sloping.

Such is the topography at KCF, which has an average slope of seven percent. From one end of KCF to the other, the elevation ranges from 4,620 feet to 6,200 feet, with the main camp at an elevation of 5,180 feet. The site for the new reservoir is at an elevation of approximately 5,320 feet. Figure 3-1 shows the contours in the area of the project site.

3.5 SOILS

According to the *Soil Survey of Island of Hawaii, State of Hawaii*, the soil type found at the project site is that of rLLD, Lalaau extremely stony muck, 6 to 20 percent slopes. This soil series is found on the uplands of Mauna Loa at elevations ranging from 3,500 to 7,000 feet, and receives from 90 to 150 inches of rain annually. A representative profile shows that the surface layer is very dark brown, extremely stony muck and is underlain by fragmented Aa lava. Its permeability is rapid, runoff is slow, and the erosion hazard is slight. Lalaau soils are used for woodland, wildlife habitat, and watersheds.



Source: USGS Report R47

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FIGURE 3-2
 RAINFALL MAP

KULANI CORRECTIONAL FACILITY
 WATER SYSTEM IMPROVEMENTS
 WAIAKEA, SOUTH HILO, HAWAII

3.6 HYDROLOGY

There are no streams, perennial or intermittent, running through the facility's boundaries. The closest water features to the site are swamps which are located over two miles away at the northeast base of Kulani Cone and at 0.9 miles South 80° East of Kulani Cone (Na Lua Mahoe). These swamps are small areas of standing water which are principally fed by runoff. During periods of drought, most of the swampy areas go dry (Stearns and MacDonald, 1946).

In the South Hilo district of the island of Hawaii, groundwater occurs mostly as basal groundwater and as perched groundwater. The basal groundwater in this area is abundant, but over 5,000 feet below the project site. A large portion of the basal water is discharged through springs near the coast or slightly inland. Perched water in the eastern areas of South Hilo has been developed using a system of tunnels. However, hydrogeological studies by Stearns and MacDonald have indicated that there is no perched water near KCF.

3.7 FLOOD HAZARDS

According to the Flood Insurance Rate Map, which is generated by the Federal Emergency Management Agency, this area is outside of the 500-year flood plain.

3.8 FLORA AND FAUNA

The proposed project site is located within a native forest which is a habitat to several endangered flora and fauna species. According to the US Department of the Interior, Fish and Wildlife Service (FWS), within a two-kilometer radius of the project site, there have been sightings of six species of birds and three species of plants that are federally listed as threatened or endangered. There is also one plant species that is considered rare and a Federal Species of Concern. The following list summarizes the FWS list.

TABLE 3.1
RECENT RARE SPECIES OCCURRENCES WITHIN A 2 KM RADIUS OF THE
PROPOSED PROJECT SITE

SOURCE: US FISH AND WILDLIFE SERVICE, AUGUST 3, 1998

| <u>Scientific Name</u> | <u>Common Name</u> | <u>Last Observed</u> | <u>Federal Status</u> |
|-----------------------------------|--------------------|----------------------|-----------------------|
| <u>Animals</u> | | | |
| <i>Oreomystis mana</i> | Hawaii Creeper | 1987 | Endangered |
| <i>Loxops coccineus coccineus</i> | Hawaii 'Akepa | 1992 | Endangered |

| | | | |
|------------------------------|-------------------------|------|--------------------|
| <i>Hemignathus munroi</i> | 'Akiapola'au | 1987 | Endangered |
| <i>Puffinus newelli</i> | Newell Shearwater, 'A'o | 1986 | Threatened |
| <i>Corvus hawaiiensis</i> | Hawaiian Crow, 'Alala | 1971 | Endangered |
| <i>Branta sandvicensis</i> | Hawaiian Goose, Nene | 1987 | Endangered |
| <u>Plants</u> | | | |
| <i>Phyllostegia velutina</i> | | 1991 | Endangered |
| <i>Clermontia lindseyana</i> | | 1982 | Endangered |
| <i>Phyllostegia racemosa</i> | | 1982 | Endangered |
| <i>Stenogyne macrantha</i> | | 1984 | Species of Concern |

The FWS also stated that the federally endangered Hawaiian hawk (*Buteo solitarius*) and the federally endangered hoary bat (*Lasiurus cinereus semotus*) may occur intermittently as they transit through the area. However, both of these species were not listed on FWS's list of recent rare species occurrences within a 2 km radius which dates back to 1970.

Although the proposed project site is located within a native forest which is home to several endangered species, according to the Nature Conservancy's Hawaii Natural Heritage Program Database, there have been no recordings of rare or endangered species at the project site. Also, no rare ecosystems have been recorded in the same area as the project site. The *Puffinus newelli*, which is mentioned above, was found wounded outside of the main camp area. The bird was nurtured back to health and released. According to the Nature Conservancy's map, this was one of the closer animal sightings to the project site. A Koa Ohia Mixed Montane Mesic Forest, which is a rare forest type, is located to the west and northwest of the project site. Copies of the Nature Conservancy's letter and map, as well as FWS's letter, are included in Appendix A.

Dr. James Jacobi of the USGS, Biological Resources Division, Kilauea Field Station has completed a survey of the vascular plants in the vicinity of the project site. A total of 55 vascular plants were found within the study area, 19 of which are native species and 36 are introduced. None of the native species found are listed as endangered or threatened by either the State of Hawaii or the federal government. A copy of Dr. Jacobi's survey is included in Appendix C.

Dr. Jacobi also noted that the Hawaiian hawk and the Nene fly over this area and may occasionally use the site. However, this site is not a primary use area for either species.

3.9 ARCHAEOLOGY

The Department of Land and Natural Resources, State Historic Preservation Division has stated in a letter, dated July 24, 1998, that they "have no record of historic sites in the proposed project area and it is doubtful that any exist". The letter also went on to say that "the probability of finding pre-contact age Hawaiian sites in this area is low because of the inland location and relatively high elevation. Few activities took place in locales such as this and the ones that we know about, such as bird-catching, seem to have left little material evidence. The correctional facility itself is less than 50 years old and thus does not qualify as an historic property".

SECTION 4

SHORT-TERM IMPACTS AND MITIGATIVE
MEASURES

SECTION 4 SHORT-TERM IMPACTS AND MITIGATIVE MEASURES

Short-term impacts are impacts that occur during construction activities. Construction activities can affect air quality, water quality, noise level, traffic patterns, flora and fauna, and archaeological sites. Construction activities can also affect the local social and economic conditions. The following sections discuss the anticipated short-term impacts and their associated mitigative measures.

4.1 AIR QUALITY

Short-term impacts from dust and construction equipment emissions can be expected during construction activities. Site work, which includes clearing, excavating, filling, and grading, can create temporary dust clouds. A typical mitigative measure is to water down the site using a water truck. This may entail hauling water up to the site from Hilo since the contractor may not be able to use the stored water near the project site. Another method to reduce dust emissions is to line the graded areas with the polyethylene liner as soon as possible.

Emissions due to construction equipment can be reduced by keeping the equipment in good working condition and by using emission control devices.

Fortunately, the project site is remote and is not located near any residential or commercial areas. Prevailing winds from the northeast should blow emissions away from the facility and up toward Mauna Loa. Impacts to the air quality are not expected to be significant.

4.2 WATER QUALITY

Impacts to water quality are not expected to be significant. No surface water features are located near the project site. Appropriate silt containment devices shall be installed to reduce the amount of sediment leaving the project limits. Construction equipment shall be kept in good working condition to minimize the risk of fluid leaks which could be picked up by runoff. Significant leaks or spills shall be properly cleaned up and disposed of at an approved site. Due to the type of soil found at the site, any runoff generated is expected to infiltrate the soil rapidly. In addition, all earthwork and grading shall be in conformance with Chapter 10, Erosion and Sediment Control, of the Hawaii County Code.

Groundwater in the vicinity of the site will most likely occur as either basal or perched. Runoff that infiltrates the soil will percolate through many layers of rock and soil which actually clean the water before it reaches its final destination. Therefore, impacts to groundwater are negligible.

4.3 NOISE

According to HAR 11-46, Community Noise Control, noise is defined to mean any sound that may produce adverse physiological or psychological effects or interfere with individual or group activities, including but not limited to communication, work, rest, recreation, or sleep. Fortunately, KCF's main camp is located about a half a mile away from the site, and no other establishments are located within miles. It is impossible to eliminate construction noise, but it can be minimized through the use of mufflers on construction equipment and by limiting work to standard working hours. If the construction activity emits or may emit noise levels in excess of the maximum permissible levels as specified in HAR 11-46, a permit from the Department of Health is required.

4.4 TRAFFIC

Stainback Highway, a two-lane paved road, connects KCF with Highway 11 near the southern edge of Hilo town. This is the only access into and out of the facility except for some 4-wheel drive trails. Additional traffic along Stainback Highway due to the hauling of equipment and materials should not have a significant impact on the local community since Stainback Highway does not provide access to large residential or commercial areas. Commuters on Highway 11 may experience a slight inconvenience due to the slower moving vehicles. However, this inconvenience will be periodic and not continuous and can be timed to avoid any rush hour traffic. Traffic on either highway will not need to be rerouted. For these reasons, traffic impacts are expected to be minimal.

4.5 FLORA AND FAUNA

The cleared area consists mostly of native shrubs, ferns, and trees with a few alien plants and no threatened or endangered flora species. Although the project site may already contain a few alien plants, the project can increase the number of alien plants by bringing in construction equipment and materials that may be contaminated with seeds. The introduction of alien plants can be reduced by establishing vehicle and equipment cleaning stations well away from the project site and by using on-site soils and gravel for any embankment. In addition, it is recommended by the USGS that herbicides be used to control all individual plant species that are coded with a "2" in the Invasive column of Table 2 of Dr. Jacobi's survey in Appendix C. Specifically, these species are *Hypericum kouytchense*, *Pennisetum clandestinum*, *Rubus argutus*, and *Rubus niveus* and are considered to be extremely invasive. It was also recommended that if individuals of *Rubus ellipticus* are found at the site, they should be eliminated as soon as possible.

Construction related impacts such as noise and dust may displace animals which frequent the site, however once construction is complete, the animals should return. In addition, since the site is not a primary use area for any endangered or threatened fauna, impacts are considered to be minimal.

4.6 ARCHAEOLOGY

According to the Department of Land and Natural Resources, State Historic Preservation Division (Division), there is no record of historic sites in the proposed project area. Therefore, impacts to any archaeological sites are considered minimal. However, in the event that any evidence of historic sites is discovered during construction, all activities shall cease and the Division shall be notified immediately. The Division may recommend appropriate mitigative measures or even data recovery work, both of which shall be reviewed and approved by the Division or its approved representative.

4.7 SOCIO-ECONOMIC

Short-term socio-economic impacts include the use of local labor and materials. This is not expected to boost the local economy substantially, but it should have a positive impact. Inmate labor will be utilized for certain tasks, which reduces the overall cost of labor. Working outdoors on the water system improvements can also boost morale at the facility since it will be a change of pace from their normal routine. The project is expected to have a positive effect on the social and economic community.

SECTION 5

LONG-TERM IMPACTS AND MITIGATIVE
MEASURES

SECTION 5 LONG-TERM IMPACTS AND MITIGATIVE MEASURES

Long-term impacts are those impacts which both directly and indirectly affect the surrounding environment once construction is completed. Such impacts include water reliability for KCF, impacts to local flora and fauna, and impacts to the local economy, all of which are discussed in the following sections.

5.1 WATER RELIABILITY

The increase in reservoir storage capacity should provide KCF with a more reliable source of potable water. During periods of minimal rainfall, the additional finished water storage will be able to provide the facility with additional water until the next rain event. This should reduce the amount of water hauled to the facility and in turn reduce hauling expenses. The new reservoir will also provide additional storage to ensure that there is a sufficient amount of water for fire flow.

5.2 FLORA AND FAUNA

The introduction of alien plant species could be a long-term problem if not mitigated properly. Once construction is complete, inspections of the site will be conducted every four months for two years by KCF staff who have been educated on plant identification. The U.S.G.S. Kilauea Field Station is willing to collaborate with KCF on the inspection surveys. The inspections will be conducted to make sure that the population of invasive plants are not increasing at a rapid rate and to make sure that these plants are not spreading to otherwise pristine areas surrounding the project site. As with the short-term mitigative measures, herbicides shall be used on *Hypericum kouytchense*, *Pennisetum clandestinum*, *Rubus argutus*, and *Rubus niveus* which are considered to be extremely invasive. It was also recommended that if individuals of *Rubus ellipticus* are found that the site, they should be eliminated as soon as possible.

No long-term impacts are anticipated for any endangered or threatened species of flora or fauna.

5.3 SOCIO-ECONOMIC

Potable water has been the limiting factor for population growth at KCF. Providing more reservoir storage capacity will give KCF the opportunity to increase its inmate population. Transferring inmates to KCF will provide some relief to the overcrowding at other facilities throughout the State. An increase in inmate population will also mean an increase in staff population, thereby creating additional jobs for the local community. Therefore, impacts to the local economy are considered positive.

SECTION 6

AGENCIES/GROUPS CONSULTED FOR
PRE-CONSULTATION

**SECTION 6
AGENCIES/GROUPS CONSULTED FOR PRE-CONSULTATION**

The following agencies were consulted in the preparation of the Draft Environmental Assessment. Agencies that responded to the pre-assessment consultation are indicated by an "**". Copies of all correspondence received are included in Appendix A.

6.1 FEDERAL AGENCIES

- * Department of the Army, U.S. Army Engineer District, Honolulu
- National Park Service
- United States Department of Agriculture, Natural Resources Conservation Service
- United States Department of the Interior, U.S. Geological Survey
- * United States Department of the Interior, Fish and Wildlife Service

6.2 STATE AGENCIES

- Department of Land and Natural Resources, Aquatic Resources Division
- Department of Land and Natural Resources, Office of Conservation and Environmental Affairs
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Land and Natural Resources, Na Ala Hele (Trails) Program
- * Department of Land and Natural Resources, Division of Forestry and Wildlife
- * Department of Land and Natural Resources, Land Division, Engineering Branch
- * Department of Health, Safe Drinking Water Branch

6.3 COUNTY OF HAWAII AGENCIES

- * Planning Department
- * Department of Public Works, Engineering Division
- * Department of Water Supply

6.4 COMMUNITY GROUPS

- * University of Hawaii, Environmental Center
- * The Nature Conservancy
- The Outdoor Circle
- The Sierra Club Hawaii Chapter

SECTION 7

AGENCIES/GROUPS CONSULTED FOR
DRAFT ENVIRONMENTAL ASSESSMENT

**SECTION 7
AGENCIES/GROUPS CONSULTED FOR
DRAFT ENVIRONMENTAL ASSESSMENT**

The following agencies were consulted in the preparation of the Final Environmental Assessment. Agencies that responded during the Draft Environmental Assessment 30-day comment period are indicated by an "*". Copies of all correspondence received and transmitted are included in Appendix B.

7.1 FEDERAL AGENCIES

- * United States Department of the Interior, U.S. Geological Survey
- * United States Department of the Interior, Fish and Wildlife Service

7.2 STATE AGENCIES

Department of Land and Natural Resources, Office of Conservation and
Environmental Affairs
Department of Land and Natural Resources, State Historic Preservation Division
Department of Land and Natural Resources, Division of Forestry and Wildlife
Department of Health, Safe Drinking Water Branch

7.3 COUNTY OF HAWAII AGENCIES

- * Planning Department

7.4 COMMUNITY GROUPS

University of Hawaii, Environmental Center
The Nature Conservancy
Hilo Public Library
Olaa Kilauea Management Group

**SECTION 8
NOTICE OF DETERMINATION**

This Final Environmental Assessment constitutes a Finding of No Significant Impact (FONSI). An Environmental Impact Statement will not be required. Although there are a few impacts which have the potential to adversely affect the environment, most of these impacts are short-term and can be minimized by using the proposed mitigative measures. The benefits realized by the construction of the water system improvements outweigh the potentially adverse impacts.

SECTION 9

REFERENCES

**SECTION 9
REFERENCES**

1. Barrett Consulting Group. *Kulani Correctional Facility Water/Sewer Study*. April 1991.
2. Commission on Water Resource Management, Department of Land and Natural Resources. *Hawaii County Water Use and Development Plan*. Review Draft. February 1992.
3. Department of Geography, University of Hawaii. *Atlas of Hawaii, Second Edition*. 1983.
4. Federal Emergency Management Agency. *Flood Insurance Rate Map*. September 16, 1988.
5. Imata & Associates, Inc. *Kulani Correctional Facility Preliminary Engineering Report for New Potable Water Sources*. April 1984.
6. The Nature Conservancy of Hawaii. Letter dated July 28, 1998.
7. *Negative Declaration Kulani Correctional Facility (KCF) Water System Improvements*. May 14, 1984.
8. Stearns, Harold T. and MacDonald, Gordon A. *Geology and Ground-Water Resources of the Island of Hawaii*. USGS Division of Hydrography Bulletin 9, October 1946.
9. United States Department of Agriculture Soil Conservation Service in cooperation with University of Hawaii Agricultural Experiment Station. *Soil Survey of Island of Hawaii, State of Hawaii*. December 1973.
10. United States Department of the Interior Fish and Wildlife Service. Letter dated August 11, 1998.
11. United States Department of the Interior, U.S. Geological Survey, and State of Hawaii Department of Land and Natural Resources, *Water Resources Summary - Island of Hawaii Report R47*, April 1973.

APPENDIX A

COMMENTS RECEIVED DURING THE
PRE-ASSESSMENT CONSULTATION PERIOD

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Stephen K. Yamashiro
Mayor



Jiro A. Sumida
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 · Hilo, Hawaii 96720-4252
(808) 961-8321 · Fax (808) 961-8630

June 17, 1999

RECEIVED
JUN 18 1999

EDWIN H MARUYAMA PE
FUJITA & ASSOCIATES INC
765 AMANA STREET SUITE 201
HONOLULU HAWAII 96814

FUJITA & ASSOCIATES

SUBJECT: ENVIRONMENTAL ASSESSMENT
Kulani Correctional Facility, Water System Improvements
Waiakea, South Hilo, Hawaii

We acknowledge receipt of your letter concerning the subject matter, and provide you with our comments as follows:

1. Any building construction shall conform to all requirements of code and statutes of the County of Hawaii.
2. All earthwork and grading shall be in conformance with Chapter 10, Erosion and Sediment Control, of the Hawaii County Code.
3. We do not need to receive a copy of the environmental assessment when it is completed.

Should there be any questions concerning this matter, please feel free to contact Mr. Casey Yanagihara in our Engineering Division at (808)961-8327.

Galen M. Kuba, Division Chief
Engineering Division

CKY



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

25 AUPUNI STREET • HILO, HAWAII 96720
TELEPHONE (808) 961-8660 • FAX (808) 961-8657

June 23, 1999

RECEIVED
JUL 06 1999

Mr. Edwin H. Maruyama, P.E., Vice President
Fujita & Associates, Inc.
765 Amana Street, Suite 201
Honolulu, HI 96814

FUJITA & ASSOCIATES

100

ENVIRONMENTAL ASSESSMENT (EA) FOR
KULANI CORRECTIONAL FACILITY WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII
TAX MAP KEY: 2-4-008:009

This is in response to your letter of June 14, 1999 requesting comments for the subject EA.

Please be informed that the property is not within the service limits of the Department's existing water system facilities. The nearest Department of Water Supply's water system facility is at the end of an existing 8-inch waterline along the Stain Back Highway, approximately 18 miles from the property. The applicant should comply with all Federal, State, and County regulations concerning the use of catchment water.

Should there be any questions, please call our Water Resources and Planning Branch at 961-8660.

Milton D. Pavao, P.E.
Manager

WA:gms

... *Water brings progress...*

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



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

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

In reply, please refer to:
EMO / SDWB

June 21, 1999

RECEIVED
JUN 21 1999

FUJITA & ASSOCIATES *AW*

Mr. Edwin H. Maruyama, P.E.
Vice President
Fujita and Associates, Inc.
765 Amana Street, Suite 201
Honolulu, Hawaii 96814

Dear Mr. Maruyama:

SUBJECT: PWS 153, KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS

The Department of Health (DOH) acknowledges your submittal of the Kulani Correctional Facility Water System Improvements pre-assessment consultation request. We have reviewed the submitted information and provide the following comments.

1. Any improvements to the Kulani Correctional Facility water system requires approval by the Director of Health as covered under the Hawaii Administrative Rules, Title 11, Chapter 20, Rules Relating to Potable Water Systems. Section 11-20-30 addresses the requirements of a modified public water system.
2. The draft environmental assessment should address the alternative of developing a groundwater source.
3. DOH, Safe Drinking Water Branch, requests a copy of the Draft Environmental Assessment be submitted for review.

If you have any questions, please call Mark Yonamine of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Sincerely,

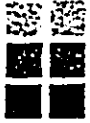
William Wong

WILLIAM WONG, P.E., Chief
Safe Drinking Water Branch
Environmental Management Division

MY:gm

c: Glenn Tomori, SDWB Registered Sanitarian

Fujita & Associates, Inc.



765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

July 16, 1999

Mr. William Wong, Chief
State of Hawaii
Safe Drinking Water Branch
919 Ala Moana Blvd., #308
Honolulu, Hawaii 96814

Attention: Mr. Mark Yonamine

Dear Mr. Wong:

SUBJECT: KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII

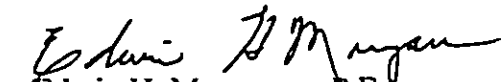
Thank you for your comments to our pre-assessment consultation request. We have the following responses to your comments:

1. Construction plans will be submitted to the Department of Health for approval under HAR 11-20, Rules Relating to Potable Water Systems.
2. The draft environmental assessment does not address the alternative of developing a groundwater source. The reason for this is that this project is not developing a new source of water. The proposed improvements only include a new finished water storage tank and a cover for the open raw water reservoir.
3. A copy of the draft environmental assessment will be sent to your office.

If you have any other comments about the proposed project, please call me at 944-9633.
Thank you for your time.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813
June 29, 1999

TIMOTHY E. JOHNS
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

JANET E. KAWELO
DEPUTY

AQUACULTURE DEVELOPMENT
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ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
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LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

Mr. Edwin H. Maruyama, P.E.
Vice President
Fujita and Associates, Inc.
765 Amana Street, Suite 201
Honolulu, Hawaii 96814

RECEIVED
JUL 02 1999

FUJITA & ASSOCIATES

Dear Mr. Maruyama:

RE: Kulani Correctional Facility Water System Improvements, Waiakea, South
Hilo, Hawaii, Pre-assessment Consultation

We have reviewed the information provided for the proposed referenced project and recommend the following considerations be noted when developing the project. Wildlife including nene and plover will be attracted to the new water sources. The "Hypalon" cover should be designed to prevent birds from being entrap or allowing them to drown in the reservoirs. The fog interception devices could be installed over the catchment area to increase water accumulation in the reservoirs. Thank you for allowing the Division of Forestry and Wildlife to comment on this project.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael G. Buck".

Michael G. Buck
Administrator

Copy: Hawaii DOFAW
Ed Henry, Land Division

Fujita & Associates, Inc.



765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

July 16, 1999

Mr. Timothy E. Johns, Chairperson
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street
Honolulu, Hawaii 96813

Attention: Mr. Michael G. Buck

Dear Mr. Johns:

SUBJECT: KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII

Thank you for your comments to our pre-assessment consultation request. We have the following responses to your comments:

1. The new water tank is for treated water and will be permanently covered. It should not attract birds such as the nene and the plover.
2. The "Hypalon cover will be installed in such a way that it will prevent birds from being entrapped and possibly drowning in the reservoir.
3. There are two reasons for the cover. The first is to reduce evaporation thereby increasing the available water supply. The second reason is to prevent animals and particulates from getting in the open reservoir. The fog interception device may be a good device to increase water accumulation, but it does not prevent animals and particulates from getting into the open reservoir.

If you have any other comments about the proposed project, please call me at 944-9633.
Thank you for your time.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Blvd, Rm 3-122
Box 50088
Honolulu, HI 96850

AUG 11 1998

In Reply Refer To: JMC

Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
765 Amana St., Suite 201
Honolulu, Hawaii 96814

RECEIVED
AUG 12 1998

FUJITA & ASSOCIATES *EM*

RE: Kulani Correctional Facility water system improvements, Waiakca, South Hilo, Hawaii.

Dear Mr. Maruyama:

The U.S. Fish and Wildlife Service (Service) has reviewed your request for pre-assessment consultation on proposed water system improvements to the Kulani Correctional Facility, Waiakca, South Hilo, Hawaii. The project sponsor is the State of Hawaii Department of Accounting and General Services (DAGS), and it is our understanding that your company is representing DAGS in the preparation of an Environmental Assessment (EA) for the proposed project. The proposed project is to construct a new 3.2 acre water catchment, a new 5 million gallon (mg) open reservoir, a new 0.6 mg glass clad steel reservoir, and appurtenances within a State Land Use Conservation District. The Service offers the following comments for your consideration in the preparation of the EA.

The Service has reviewed the provided information as well as other information contained in our files. The proposed project is located on a geologically young lava flow within native forest that is habitat to several endangered species. Our records show six species of birds and three species of plants federally listed as threatened or endangered to occur within a two-kilometer radius of the project site (see attached table). Furthermore, there are several additional species in the project area considered to be rare, including one plant species that is a Federal Species of Concern. In addition, the federally endangered Hawaiian hawk (*Buteo solitarius*) and the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) are known from the general area. These species may occur intermittently at the project site as they transit through the area. The Service is concerned that any additional construction activities in this ecologically sensitive native forest may catalyze significant long-term ecological effects and contribute to the permanent fragmentation of the habitat.

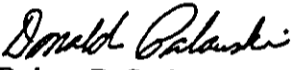
The Service recommends that potential project-related impacts to fish and wildlife resources, especially federally listed species and their habitats, be addressed in the draft EA. Potential direct and indirect impacts, including the introduction of alien species, habitat fragmentation and other forms of habitat degradation (through alteration of vegetative structure, noise, dust, and soil compaction), sediment runoff, and potential contamination by construction-related products, such as fuels, should be addressed.

We are aware that the U.S. Geological Survey, Biological Resource Division (BRD) will be conducting a biological survey of the preferred project site and immediately surrounding area prior to the preparation of the EA to identify fish and wildlife resources that may be directly and indirectly impacted by the proposed project. We support this effort and look forward to learning about BRD's findings, however, we recommend also conducting biological surveys of alternative project sites. Furthermore, we recommend that the EA include an analysis of this project's relation to the potential expansion of the Kulani Correctional Facility. If this site will become obsolete or require significant modification if Kulani is expanded, then we recommend that this project be postponed at this time until definitive expansion plans are developed.

The Service recommends that alternatives to this project site be considered. We recommend that minimization and mitigative measures be proposed in the EA for any anticipated impacts to fish and wildlife resources. Mitigation for anticipated impacts should include, but not be limited to: 1) measures to minimize the spread of alien species, such as vehicle and equipment cleaning stations established in sanctioned sites well away from the project site, and 2) measures to monitor alien species distributions near project areas several years following project initiation.

The Service appreciates the opportunity to comment and looks forward to receiving a copy of the draft EA, when completed. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Mick Castillo at (808) 541-3441.

Sincerely,


Robert P. Smith
Pacific Islands Manager

cc: Jim Jacobi, BRD
Tanya Rubenstein, Olaa-Kilauea Group

Kulani Correctional Facility water system improvements, Waiakea, South Hilo, Hawaii

Recent rare species occurrences within a 2 km radius of the proposed project site Date: 03 Aug

SCIENTIFIC NAME COMMON NAME LAST OBSERVED STATUS

Vertebrates

| | | | |
|----------------------------|-------------------------|------|---|
| OREOMYSTIS MANA | HAWAII CREEPER | 1977 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1977 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1977 | E |
| PUFFINUS NEWELLI | NEWELL SHEARWATER, 'A'O | 1986 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1977 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1977 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1970 | E |
| OREOMYSTIS MANA | HAWAII CREEPER | 1987 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1970 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1977 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1977 | E |
| CORVUS HAWAIIENSIS | HAWAIIAN CROW, 'ALALA | 1971 | E |
| BRANTA SANDVICENSIS | NENE, HAWAIIAN GOOSE | 1987 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1992 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1977 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1987 | E |
| HEMIGNATHUS MUNROI | 'AKIAPOLA'AU | 1977 | E |
| LOXOPS COCCINEUS COCCINEUS | HAWAII 'AKEPA | 1979 | E |
| OREOMYSTIS MANA | HAWAII CREEPER | 1977 | E |
| BRANTA SANDVICENSIS | NENE, HAWAIIAN GOOSE | 1977 | E |

Plants


| | | | |
|----------------------------|--|------|-----|
| PHYLLOSTEGIA VELUTINA | | 1991 | E |
| CLERMONTIA LINDSEYANA | | 1982 | E |
| PHYLLOSTEGIA RACEMOSA | | 1982 | E |
| PHYLLOSTEGIA VELUTINA | | 0 | E |
| PHYLLOSTEGIA VELUTINA | | 0 | E |
| PHYLLOSTEGIA RACEMOSA | | 0 | E |
| TREMATOLOBELIA GRANDIFLORA | | 0 | SOC |
| STENOGYNE MACRANTHA | | 1984 | SOC |

The Nature
Conservancy
of Hawai'i
1116 Smith Street
Honolulu, Hawaii 96817
Phone (808) 537-4508
Facsimile (808) 545-2019

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The
Nature
Conservancy

International
Headquarters
1815 North Lynn Street
Arlington, Virginia 22209
<http://www.tnc.org>

The Nature
Conservancy
of Hawai'i 

July 24, 1998

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JUL 28 1998

FUJITA & ASSOCIATES

Edwin Maruyama
Fujita & Associates, Inc.
765 Amana Street Suite 201
Honolulu, Hawaii 96814

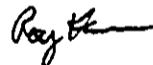
Dear Mr. Maruyama,

Enclosed is the information you requested for the Kulani Correctional Facility Water System Improvements. According to the Hawaii Natural Heritage Program Database, there have been no recordings of rare or endangered species in your project site. Also, no rare ecosystems have been recorded in the same area. I have included a photocopy of our Heritage quadrangle map for your reference.

Even though there are no recordings immediate to your project site, you probably should address the presence of the federally threatened *Puffinus newelli* (dot #117) that have been recorded on prison grounds. Also, you may need to address the numerous recordings of rare species and ecosystems adjacent to the prison property (see map).

Please take note that database information is not definite should not be used in place of on-site surveys. If you have any further questions, you may contact me at 537-4508.

Sincerely,



Roy Kam
Database Coordinator
Hawaii Natural Heritage Program

Notice

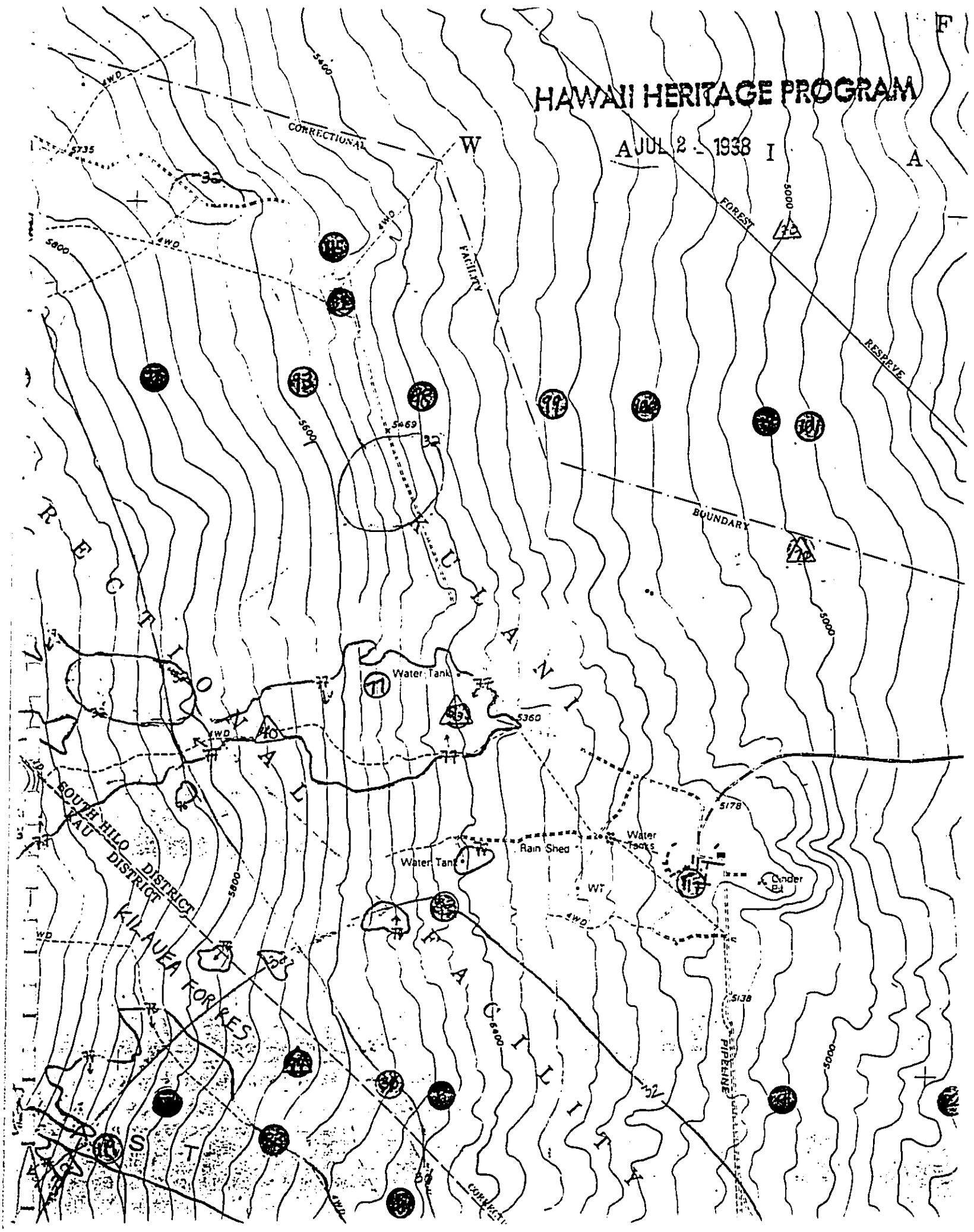
The Nature Conservancy's Hawaii Natural Heritage Program database is dependent on the research and observations of many scientists and individuals. In most cases this information is not the result of comprehensive site-specific field surveys, and is not confirmed by the Heritage staff. Many areas in Hawaii have never been thoroughly surveyed, and new plants and animals are still being discovered. Database information should never be regarded as final statements or substituted for on-site surveys required for environmental assessments. Data provided by the Heritage Program do not represent a position taken by The Nature Conservancy of Hawaii. Heritage information is only for the intended use of the individual or organization who requested it. It may not be distributed in any way without the consent of the Hawaii Natural Heritage Program.

Please cite the Heritage Program and primary sources in all documentation and reports.

Hawaii Natural Heritage Program, 1116 Smith St. Suite 201, Honolulu, HI 96817

HAWAII HERITAGE PROGRAM

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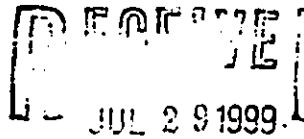


DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

July 27, 1999

Regulatory Branch



Mr. Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
765 Amana Street, Suite 201
Honolulu, Hawaii 96814

FUJITA & ASSOCIATES

AB

Dear Mr. Maruyama:

This letter responds to your request for a pre-assessment consultation for the Kulani Correctional Facility Water System Improvements, dated June 14, 1999. Based on the information you have provided I have determined that a Department of the Army permit will not be required for this project.

If you have any questions concerning this determination, please contact William Lennan of my staff at 438-9258, extension 13, and reference File No. 990000391.

Sincerely,

George P. Young
George P. Young, P.E.
Chief, Regulatory Branch



University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980
July 12, 1999

Mr. Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
763 Amana Street
Suite 201
Honolulu, Hawaii 96814

RECEIVED
JUL 22 1999

FUJITA & ASSOCIATES

Dear Mr. Maruyama:

Environmental Assessment, Preparation
Kulani Correctional Facility Water System Improvements
Waiakea, South Hilo, Hawaii

Thank you for your letter of June 14, 1999 regarding your preparation of an Environmental Assessment for the Kulani Water System Improvements. We would like to suggest that the EA address the following issues:

1. Please describe the Hypalon cover. It is unclear from the brief description of the project if this is a porous "fabric" or a solid cover. Since potential contamination of the reservoir is a concern, (Leptospirosis, Girardia, others?) the nature and "strength" of the proposed cover is of interest.
2. We note that the plan calls for an increase in the height of an existing .3mg reservoir by four feet. The EA should elaborate on what structural modifications will be taken to assure that the higher (significantly greater volume and weight) reservoir will be structurally sound.
3. What is the source of water to the reservoir? Is it primarily from catchment or wells?
4. Will the water be used for drinking or irrigation or both? Will any treatment be applied?
5. The cost of the project should include sufficient funds to permit landscaping of the reservoir so as to mitigate visual obtrusiveness in an otherwise quite rural area.

We appreciate the opportunity to offer these brief suggestions and look forward to reviewing the draft EA when it becomes available.

Sincerely,

Jacquelin N. Miller, Ph.D.
Associate Environmental Coordinator

Cc: John Harrison
Roger Fujioka
OEQC

Fujita & Associates, Inc.



765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

August 3, 1999

Ms. Jacquelin N. Miller, Ph.D.
Associate Environmental Coordinator
University of Hawaii
Environmental Center
2250 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Ms. Miller:

**SUBJECT: KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII**

Thank you for your comments to our pre-assessment consultation request. We have the following responses to your comments:

1. The Hypalon cover is a solid polyester fabric reinforced geomembrane. Hypalon is an excellent high performance material with a 30 year warranty. The new floating cover will help to reduce evaporation and improve water quality by preventing contamination by animals, airborne particulates, and other pollutants. The floating cover will also block off sunlight thereby preventing algae bloom.
2. Since the pre-assessment consultation letter was sent out, the scope of the project has changed. The increase in height of the existing 0.3 mg reservoir by four feet has been deleted from the project.
3. The reservoir's source of water is a five-acre polyethylene-lined raw water catchment area which includes a five-million gallon polyethylene-lined earthen raw water reservoir. The Hypalon cover is for this raw water reservoir. There are no wells in this area.
4. The water will be used for drinking only. The facility's irrigation system has its own catchment and diversion system.

Treatment of the catchment water consists of a gravity sand filter and chlorination which meet the requirements of the Surface Water Treatment Rule.

Ms. Miller
August 3, 1999
Page 2

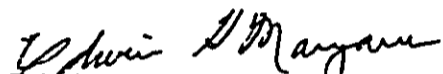
5. Landscaping was not included as part of this project since the area had been previously cleared and existing flora consists of native shrubs, ferns, and trees with a few alien plants mixed in. In addition, the existing five-acre catchment, the existing 0.3 mg reservoir, and the treatment facility have no landscaping associated with them.

You should be receiving a copy of the draft EA soon. If you have any other concerns, feel free to comment during the 30-day comment period which begins on August 8, 1999.

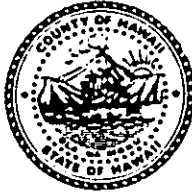
Thank you for your time.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President

Stephen K. Yamashiro
Mayor



Virginia Goldstein
Director

Russell Kokubun
Deputy Director

County of Hawaii

PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-8742

RECEIVED
JUL 6 1999

FUJITA & ASSOCIATES

June 30, 1999

Mr. Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
765 Amama Street, Suite 201
Honolulu, HI 96814

Dear Mr. Maruyama:

**Pre-Assessment Consultation regarding Preparation of Draft Environmental Assessment for Water System Improvements at Kulani Correctional Facility
TMK: 2-4-08: 9; Upper Waiakea Forest Reserve, South Hilo, Hawaii**

Thank you for your letter dated June 14, 1998, requesting our preliminary comments regarding the preparation of a draft environmental assessment for the Kulani Correctional Facility water system improvement project.

The project site is situated within the State Land Use Conservation District. The County of Hawaii does not have jurisdiction over uses of land within the Conservation District. We have no further comment to offer. We do note, however, that an identical request was submitted by your office at about the same time last year. Our current response has not changed from our response of last year.

Thank you for giving our office the opportunity to comment. We will not require the submittal of draft or final environmental assessments for this project for our review.

Sincerely,

A handwritten signature in cursive script, appearing to read "Virginia Goldstein".
VIRGINIA GOLDSTEIN
Planning Director

DSA:pak
f:\wp60\czm\Ch343\1999\LKulan01.dsa



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621
HONOLULU, HAWAII 96809

JUL 12 1999

AQUACULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

Ref:PS:EH

Mr. Edwin H. Maruyama, P.E.
Vice President
Fujita & Associates, Inc.
765 Amana Street, Suite 201
Honolulu, Hawaii 96814

RECEIVED
JUL 19 1999

FUJITA & ASSOCIATES *HA*

Dear Mr. Maruyama:

Subject: Kulani Correctional Facility Water System
Improvements, Waiakea, South Hilo, Hawaii

We have reviewed the subject project description and offer the attached comments from the Land Division Engineering Branch for your consideration.

Comments from the department's Division of Forestry and Wildlife were previously submitted to you.

Thank you for the opportunity to comment on the proposed project.

Should you have any question or require further assistance, particularly in addressing the requirements related to development in the State Conservation District, please contact staff planner Ed Henry at 587-0380.

Very truly yours,

Timothy E. Johns
TIMOTHY E. JOHNS,
Chairperson

Attachment

c.c. DOFAW
Engineering Branch
HDLO

ENGINEERING BRANCH

COMMENTS

To supplement the water catchment system and to provide water during periods of minimal rainfall we suggest investigation of groundwater sources on the facility site or as near as possible to the subject facility. The investigation may include the drilling of test bores, testing, etc. to determine possible groundwater source locations.

For your information the following reports may be helpful:

1. Water System Study for Kulani Correctional Facility, Imata and Associates, Inc., December 1993.
2. Kulani Correctional Facility Water/Sewer Study, Barrett Consulting Group, April 1991.
3. Kulani Correctional Facility Master Plan, DMJM Hawaii, December 1992.

For your information; the proposed project site, according to FEMA Community Panel Map No. 155166 1075 C, is located in Zone X. This is an area outside the 500-year flood plain.

APPENDIX B

COMMENTS RECEIVED DURING THE
30-DAY DRAFT ENVIRONMENTAL ASSESSMENT
COMMENT PERIOD



United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Blvd, Rm 3-122
Box 50088
Honolulu, HI 96850

In Reply Refer To: JMC

SEP 14 1999

Mr. Edwin H. Maruyama
Fujita and Associates
765 Amana Street, Suite 201
Honolulu, HI 96814

RECEIVED
SEP 16 1999

FUJITA & ASSOCIATES *fm*

RE: Draft Environmental Assessment for Kulani Correctional Facility Water System Improvements, Waiakea, South Hilo, Hawaii

Dear Mr. Maruyama:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Draft Environmental Assessment (DEA), which we received on July 22, 1999. The project sponsor is the State of Hawaii Department of Accounting and General Services (DAGS). The Service offers the following comments for your consideration.

The proposed project involves construction of a new 600,000-gallon steel reservoir with necessary appurtenances and installation of a "Hypalon" cover over the existing open reservoir. The new reservoir will be located on previously cleared lands adjacent to the existing 300,000-gallon reservoir and will decrease the amount of water that will need to be hauled to the facility. The Hypalon cover should conserve water by reducing evaporative losses and the potential for water contamination and faunal drowning in the existing reservoir.

The DEA accurately describes known observations of threatened and endangered species near the proposed project site. However, other important native species that occur in the area are not identified. Reference is made, however, to a recent biological survey of the area conducted by Dr. Jim Jacobi of the United States Geological Survey, Biological Resources Division (BRD). It would have been beneficial if the results of that survey were included in the DEA, and we recommend that the survey report be appended to the final EA.

Alternatives to the proposed action were considered in the DEA, and we support siting the proposed project on previously disturbed ground. We believe that impacts to fish and wildlife resources anticipated to result from the proposed project were adequately assessed, and we support the mitigation measures proposed in the DEA to minimize unavoidable project-related impacts. However, we do recommend a slight modification to the proposed alien species monitoring protocol.

It has been demonstrated that some alien species may remain dormant for years before the right environmental conditions allow those species to become established. Due to the unpredictable temporal pattern of alien species invasions in Hawaii, the proposed post-construction monitoring would be more effective if it occurred at a lower frequency over a longer period of time. Thus, we recommend that the six monthly site inspections proposed in the DEA be used more effectively to recognize the establishment of a new alien species by scheduling them to occur at four-month intervals over a two-year period. Because alien species are such a serious threat to Hawaii's native plants and animals, we recommend that consideration be given to extending the monitoring period as much as possible beyond two years.

The Service believes that incorporation of these recommendations into the project will greatly reduce the potential for project-related actions to adversely impact native Hawaiian fish and wildlife resources. Based on the incorporation of the forgoing recommendations, the Service would support a Finding of No Significant Impact for the proposed project.

We appreciate the concern you have expressed for endangered and threatened species and their habitats and thank you for the opportunity to comment on the DEA. We look forward to receiving a copy of the final EA when it is available. If you have any questions regarding our comments or if we can be of further assistance, please contact Fish and Wildlife Biologist Mick Castillo at (808)541-3441.

Sincerely,



Robert P. Smith
Pacific Islands Manager

cc: DOFAW, Hawaii
CZMP, Hawaii

Fujita & Associates, Inc.



765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

November 4, 1999

Mr. Robert P. Smith
Pacific Islands Manager
U.S. Department of the Interior, Fish and Wildlife Service
Pacific Islands Ecoregion
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, Hawaii 96850

Dear Mr. Smith:

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR
KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII**


Thank you for your comments on the Draft Environmental Assessment (EA) for this project. We have the following responses to your concerns:

1. A copy of Dr. Jim Jacobi's biological survey will be appended to the Final EA.
2. The post-construction monitoring program will be extended to a period of two years with surveys occurring at four-month intervals. If possible, the program may be extended beyond two years. Dr. Jim Jacobi has offered the services of his office to collaborate on the surveys as part of their participation in the Olaa-Kilauea Management Group. With their expertise in identifying the spread and/or introduction of alien species, the monitoring program will be very successful.

We hope that your concerns were adequately addressed. If you have any questions, please call Ms. Suzette Hokama at 944-9633.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President

cc: Dr. James Jacobi, USGS Biological Resources Division



U. S. Department of the Interior
U. S. GEOLOGICAL SURVEY
BIOLOGICAL RESOURCES DIVISION
PACIFIC ISLAND ECOSYSTEMS RESEARCH CENTER



Kilauea Field Station
PO BOX 44, Building 344
Hawaii National Park, Hawaii 96718
(808) 957-7396 FAX (808) 967-3566

September 15, 1999

Suzette Hokama
Fujita and Associates, Inc.
785 Amana St., Suite 201
Honolulu, Hawaii 96814

Dear Ms. Hokama,

RE: Kulani Correctional Facility Water System Improvements

Thank you for the opportunity to review the draft Environmental Assessment (DEA) for the Kulani water system improvements. I feel that this document adequately addresses the major concerns that may arise with the planned improvements. The proposed actions (construction of a new 600,000 gallon tank and installation of a cover on the existing catchment reservoir) will not have any significant impact on native species found naturally in the area since both actions will be conducted in areas that have been previously disturbed. As indicated in the DEA, the endangered Nene goose is occasionally seen at the edge of the existing reservoir. Covering this reservoir will keep Nene from using this area, but we do not consider the use of this area to be essential for this species' survival.

I appreciate the concern shown in the DEA regarding alien species issues that may result from the proposed actions. Monitoring the potential spread of invasive alien plants, as indicated on page 5-1, is extremely important. The monitoring program needs to be formalized and conducted by field experts who are capable of identifying the spread of species already established in these areas as well as new invasive species that may become established as a result of the proposed actions. Our office would be willing to collaborate on these surveys as part of our participation in the 'Ola'a-Kilauea Management Group.

Two concerns that are not covered in the DEA are as follows:

1. Any gravel needed for the construction or leveling of the site of the new water tank should not be brought in from outside the Kulani complex. Gravel from off-site areas may contain new species of weeds that are not currently found in this area.
2. As indicated on page 3-6, native seabirds occasionally fly over this area to nesting areas at higher elevations on Mauna Loa. Bright lights are a well-documented hazard for young birds that are attracted to the lights. We recommend not having bright lights around the site at night. If lights are necessary, they should be shielded to direct the lights only to the ground.

OPTIONAL FORM NO. 10 (7-98)

FAX TRANSMITTAL # of pages **2**

| | |
|---------------------------------|--------------------------------|
| To Suzette Hokama | From Jim Jacobi |
| Organization USGS-RRD | Phone (808) 967-7396 |
| Fax (808) 951-8309 | Fax |

FOR FORMS 1-317-7888 5010-107 GENERAL SERVICES ADMINISTRATION

Ms. Suzette Hokama - page 2

Thank you again for the opportunity to review this document. If you need any further information or clarification of my comments, please contact me at (808) 967-7396 ext. 229.

Sincerely,



James D. Jacobi, Ph.D.
Botanist

| | |
|--|--|
| OPTIONAL FORM 99 (7-99) PAGE 2 of 2 | |
| FAX TRANSMITTAL | |
| # of pages = 2 | |
| To Suzette Hokama | From Jim Jacobi |
| Dept./Agency USGS-BRP | Phone # (808) 967-7396 |
| Fax # (808) 951-8309 | Fax # |
| NSN 7540-01-517-7308 | 5099-101 GENERAL SERVICES ADMINISTRATION |

Fujita & Associates, Inc.



765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

September 29, 1999

Mr. James D. Jacobi, Ph.D.
U.S. Department of the Interior
U.S. Geological Survey
Biological Resources Division
Pacific Island Ecosystems Research Center
Kilauea Field Station
P.O. Box 44, Building 344
Hawaii National Park, Hawaii 96718

Dear Mr. Jacobi:

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR
KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WALAKEA, SOUTH HILO, HAWAII**

Thank you for your comments on the Draft Environmental Assessment (EA) for this project. We agree that monitoring the potential spread of invasive alien plants is important, which is why your offer to collaborate on the monitoring surveys is greatly appreciated. Field experts such as yourself and possibly others in the Oloa-Kilauea Management Group will be needed to identify the spread and/or introduction of invasive species.

We have the following responses to your two concerns that were not covered in the Draft EA:

1. Grading at the new water tank site is expected to be minimal. If any grading is done, it will most likely be excavation. However, if gravel is required for the new water tank site, it will be from within the Kulani complex.
2. Lights are not being installed as part of this project.

We hope that your concerns were adequately addressed. If you have any questions, please call Ms. Suzette Hokama at 944-9633.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President

Stephen K. Yamashiro
Mayor



Virginia Goldstein
Director

Russell Kokubun
Deputy Director

County of Hawaii

PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-8742

September 1, 1999

Mr. Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
765 Amana Street, Suite 201
Honolulu, HI 96814

RECEIVED
SEP 03 1999

FUJITA & ASSOCIATES

Dear Mr. Maruyama:

Draft Environmental Assessment for the Proposed Kulani Correctional Facility
Water System Improvements
TMK: 2-4-08: 9: Waiakea, South Hilo, Hawaii

Thank you for your letter dated July 21, 1999, transmitting a copy of the above-described draft environmental assessment (DEA) for our review and comment. We have completed our review and have the following comments to offer for your consideration.

1. The project site is situated within an area designated as Conservation by the State Land Use Commission. The County of Hawaii does not have land use jurisdiction upon lands designated as Conservation by the State Land Use Commission. Therefore, the proposed project will not require any land use reviews or approvals from the County of Hawaii.
2. The project site is not situated within the County's Special Management Area (SMA).
3. We have no objections to the information contained within the DEA nor the anticipated Finding of No Significant Impact (FONSI).

Thank you for allowing our office the opportunity to review the DEA. We will not require a copy of the Final Environmental Assessment.

Mr. Edwin H. Maruyama, P.E.
Fujita & Associates, Inc.
Page 2
September 1, 1999

Please contact Daryn Arai of this office should you have any questions.

Sincerely,



For VIRGINIA GOLDSTEIN
Planning Director

DSA:gp
f:\wp60\Ch343\1999\LMaruy01.dsa

c: State DAGS-Hilo
OEQC



Fujita & Associates, Inc.

765 Amana Street
Suite 201
Honolulu, Hawaii 96814
Ph. 808-944-9633
Fax. 808-951-8309

September 22, 1999

Ms. Virginia Goldstein
Planning Director
Hawaii County Planning Department
25 Aupuni Street, Room 109
Hilo, Hawaii 96720

Dear Ms. Goldstein:

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR
KULANI CORRECTIONAL FACILITY
WATER SYSTEM IMPROVEMENTS
WAIAKEA, SOUTH HILO, HAWAII**

Thank you for your comments on the Draft Environmental Assessment (EA) for this project. We agree with your comments that the project site is located within State Conservation land and that the site is not within the County's Special Management Area.

Thank you for taking the time to review this document. If you have any questions, please call Ms. Suzette Hokama at 944-9633.

Sincerely yours,

FUJITA & ASSOCIATES, INC.


Edwin H. Maruyama, P.E.
Vice President

APPENDIX C

RESULTS OF A SURVEY OF VASCULAR PLANTS
BY DR. JAMES JACOBI



**Results of a Survey of Vascular Plants in the Area of the
Proposed Construction of a 600,000 Gallon Water Tank
on the Kulani Correctional Facility**

James D. Jacobi, Ph.D.
Keali'i Bio
Michelle Clapper

U.S. Geological Survey
Biological Resources Division
Pacific Island Ecosystems Research Center
Kilauea Field Station
Hawai'i National Park, HI 96718

October 20, 1999

INTRODUCTION

In June 1999 we conducted a survey of vascular plant species found in the immediate vicinity of the site of the proposed construction of a 600,000 gallon water tank located on the grounds of the Kulani Correctional Facility on the island of Hawai'i. The objectives of this survey were to 1) identify all species of vascular plants found within and immediately adjacent to the construction site, and 2) assess the impacts of the construction activities on the native and introduced plant species found in this area. Field work was conducted by all three authors of this report.

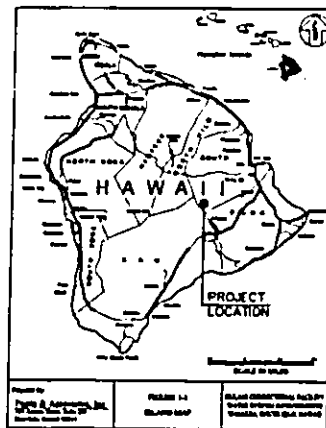


Figure 1. Location of the study area on the island of Hawai'i.

STUDY AREA

The Kulani Correctional Facility is located approximately 32 kilometers (20 miles) southwest of Hilo on the island of Hawai'i (Figure 1). The proposed construction site for the water tank is at 1,600 meters (5,250 feet) elevation in an area that receives approximately 2,700 mm (105 inches) of annual rainfall (Giambelluca, *et al.* 1986). This site is on a relatively young lava flow that erupted less than 500 years ago (Wolfe and Morris 1996). The natural vegetation of the area is a moderate-stature (generally less than 10 meters tall) forest dominated by ohia-lehua (*Metrosideros polymorpha*) with a mixed tree, shrub, and fern understory (Jacobi 1990).

All of the area to be used for the proposed water tank construction was disturbed in 1987 during construction of the existing water facilities that include a 5 million gallon lined earthen water reservoir, a 300,000 gallon holding tank, a water treatment facility, service roads, pipeline corridors, and perimeter fencing. The new water tank is planned to be built approximately 40 meters north of the existing 300,000 gallon tank (Figures 2 and 3).

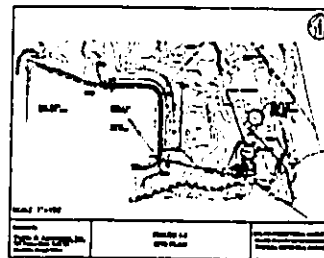


Figure 2. Detailed map of proposed construction site.

SURVEY METHODS

The plants in the proposed construction site were initially surveyed on June 20, 1999. A follow-up visit to the site was made on October 19, 1999 to verify some species identifications and to take photographs of the site. During these surveys we recorded the names of all species of vascular plants encountered in the study area. We did not attempt to subsample the area or quantify the abundance of any of the plant species for this survey. Species nomenclature follows Wagner, *et al.* 1998.

RESULTS

A total of 55 species of vascular plants were found within the study area. Of these, 19 species are native (either endemic or indigenous

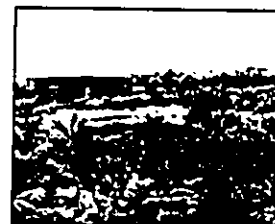


Figure 3. View of proposed site of new water tank.

species) and the remaining 36 species are introduced species (Tables 1 and 2). Additionally, many of the sites with exposed rock were found to be covered with the gray-white lichen in the genus *Stereocaulon*, a typical pioneer of recent lava flows or disturbed sites in this area.

None of the native species found in the study area are listed as endangered or threatened by either the state or federal government. Most of the native plants found in this area are typical colonizers of either recent lava flows or disturbed sites in habitats that receive more than 1,900 mm (75 inches) of annual rainfall. The most common woody species was *Metrosideros polymorpha* (Figure 4), which is the dominant tree species in the surrounding undisturbed native forest community.



Figure 4. Flowers of *Metrosideros polymorpha*.

Most of the introduced plants found within the study area are species that are usually found in disturbed sites. Several species, however, can be quite invasive in this habitat and may become very dominant and spread into the less disturbed native forest adjacent to the proposed construction site (Table 2). While many of these invasive species, like *Rubus argutus*, *Ehrharta stipoides*, *Anthoxanthum odoratum*, and *Holcus lanatus* have already invaded the adjacent plant communities, there is real concern that populations of *Rubus niveus* (Figure 5), *Rubus argutus*, *Pennisetum clandestinum*, and *Hypericum kouytchense* (Figure 6) may become well established after construction and



Figure 5. *Rubus niveus*.

pose a new and serious threat to the surrounding *Metrosideros* forest community. One other highly invasive species, *Rubus ellipticus*, not located on the proposed construction site during this survey but known from other nearby disturbed sites, may soon invade this site and also pose a serious threat to the adjacent native plant communities.



Figure 6. *Hypericum kouytchense*.

DISCUSSION AND RECOMMENDATIONS

We foresee no serious consequences to the native species that are found directly on the site planned to be cleared if the proposed construction is permitted. All of these species are relatively common throughout this habitat zone and are well represented in the adjacent native forests that have not been disturbed.

However, care must be taken that several invasive species that are currently found on the site do not proliferate and become more established in the adjacent native *Metrosideros* communities. Unless these invasive species are eliminated from the site and kept from reestablishing on the disturbed lava substrate, they may become serious problems to the remaining native-dominated communities in this area in the future. We recommend herbicide control of all individuals of the plant species indicated with the code "2" in the "Invasive?" column of Table 2. Additionally, the disturbed areas around the proposed construction site and the areas previously disturbed for construction of the existing water catchment system should be monitored annually and the invasive species controlled. If individuals of *Rubus ellipticus* are found in any of these sites, these plants should also be eliminated as soon as possible.

Finally, any gravel needed for the construction or leveling of the site of the new water tank should not be brought in from outside the Kulani complex. Gravel from off-site may contain new species of invasive weeds that are not currently found in the area.

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Table 1. List of native species of vascular plants found during this survey of the proposed area for expansion of the Kulani Correctional Facility water catchment system. Species with "E" in the Status column are endemic to Hawaii; species with "I" are indigenous to Hawaii -- i.e., naturally found in Hawaii but also known from elsewhere in the world.

| Genus | Species | Family | Common Name | Life Form | Status |
|---------------------|---------------------|---------------|-----------------|-----------|--------|
| <i>Carex</i> | <i>alligata</i> | CYPERACEAE | | Sedge | E |
| <i>Cibotium</i> | <i>glaucum</i> | DICKSONIACEAE | hapu'u treefern | Fern | E |
| <i>Coprosma</i> | <i>ernodeoides</i> | RUBIACEAE | Kukaenene | Shrub | E |
| <i>Coprosma</i> | <i>ochracea</i> | RUBIACEAE | pilo | Tree | E |
| <i>Deschampsia</i> | <i>nubigena</i> | POACEAE | pili kuahiwi | Grass | E |
| <i>Gahnia</i> | <i>gahniiformis</i> | CYPERACEAE | | Sedge | I |
| <i>Geranium</i> | <i>cuneatum</i> | GERANIACEAE | nohoanu | Shrub | E |
| <i>Luzula</i> | <i>hawaiiensis</i> | JUNCACEAE | | Rush | E |
| <i>Machaerina</i> | <i>angustifolia</i> | CYPERACEAE | 'uki | Sedge | I |
| <i>Metrosideros</i> | <i>polymorpha</i> | MYRTACEAE | 'ohia | Tree | E |
| <i>Pipturus</i> | <i>albidus</i> | URTICACEAE | mamaki | Shrub | E |
| <i>Polypodium</i> | <i>pellucidum</i> | POLYPODIACEAE | 'ae | Fern | I |
| <i>Pycneus</i> | <i>polystachyos</i> | CYPERACEAE | | Sedge | I |
| <i>Rubus</i> | <i>hawaiiensis</i> | ROSACEAE | 'akala | Shrub | E |
| <i>Sadleria</i> | <i>pallida</i> | BLECHNACEAE | ama'u treefern | Fern | E |
| <i>Styphelia</i> | <i>tameiameiae</i> | EPACRIDACEAE | pukiawe | Shrub | E |
| <i>Unicnia</i> | <i>uncinata</i> | CYPERACEAE | | Sedge | I |
| <i>Vaccinium</i> | <i>calycinum</i> | ERICACEAE | 'ohelo | Shrub | E |
| <i>Vaccinium</i> | <i>reticulatum</i> | ERICACEAE | 'ohelo 'ai | Shrub | E |

Table 2. List of introduced species of vascular plants found during this survey within the proposed area for expansion of the Kulani Correctional Facility water catchment system. Species marked with "2" in the column labeled "Invasive?" are considered to be extremely invasive in this habitat and are not currently established in the adjacent native forest. Species marked with "1" in the "Invasive?" column are also considered to be invasive but are already established in portions of the adjacent native forest.

| Genus | Species | Family | Common Name | Life Form | Invasive? |
|----------------------|-------------------------|-----------------|-----------------------------|-----------|-----------|
| <i>Agrostis</i> | <i>stolonifera</i> | POACEAE | redtop, creeping bentgrass | Grass | |
| <i>Andropogon</i> | <i>virginicus</i> | POACEAE | broomsedge | Grass | 1 |
| <i>Anemone</i> | <i>hupehensis</i> | RANUNCULACEAE | Japanese anemone | Herb | 1 |
| <i>Anthoxanthum</i> | <i>odoratum</i> | POACEAE | sweet vernalgrass | Grass | 1 |
| <i>Axonopus</i> | <i>fissifolius</i> | POACEAE | narrow-leaved carpetgrass | Grass | 1 |
| <i>Buddleia</i> | <i>asiatica</i> | BUDDLEJACEAE | dogtail, butterflybush | Shrub | |
| <i>Chrysanthemum</i> | <i>leucanthemum</i> | ASTERACEAE | ox-eye, field daisy | Herb | |
| <i>Cirsium</i> | <i>vulgare</i> | ASTERACEAE | bull thistle | Herb | |
| <i>Conyza</i> | <i>bonariensis</i> | ASTERACEAE | hairy horseweed | Herb | |
| <i>Ehrharta</i> | <i>stipoides</i> | POACEAE | meadow ricegrass | Grass | 1 |
| <i>Epilobium</i> | <i>biflaidierianum</i> | ONAGRACEAE | | Herb | |
| <i>Eragrostis</i> | <i>brownei</i> | POACEAE | sheepgrass | Grass | |
| <i>Fragaria</i> | <i>vesca</i> | ROSACEAE | European strawberry | Herb | |
| <i>Gnaphalium</i> | <i>japonicum</i> | ASTERACEAE | cudweed | Herb | |
| <i>Holcus</i> | <i>lanatus</i> | POACEAE | velvet grass, yorkshire fog | Grass | 1 |
| <i>Hypericum</i> | <i>kouytchense</i> | CLUSIACEAE | | Shrub | 2 |
| <i>Hypericum</i> | <i>parvulum</i> | CLUSIACEAE | | Herb | |
| <i>Hypochoeris</i> | <i>radicata</i> | ASTERACEAE | St John's Wort | Herb | |
| <i>Kyllinga</i> | <i>brevifolia</i> | CYPERACEAE | hairy cat's ear | Herb | |
| <i>Lotus</i> | <i>subbiflorus</i> | FABACEAE | | Sedge | |
| <i>Lotus</i> | <i>uliginosus</i> | FABACEAE | | Herb | |
| <i>Paspalum</i> | <i>urvillei</i> | POACEAE | vasey grass | Grass | 1 |
| <i>Pennisetum</i> | <i>clandestinum</i> | POACEAE | kikuyu grass | Grass | 2 |
| <i>Physalis</i> | <i>peruviana</i> | SOLANACEAE | poha | Shrub | |
| <i>Pityrogramma</i> | <i>austroamericanum</i> | HEMIONITIDACEAE | goldback fern | fern | |
| <i>Pluchea</i> | <i>indica</i> | ASTERACEAE | fleabane | shrub | |
| <i>Polygonum</i> | <i>capitatum</i> | POLYGONACEAE | | herb | |
| <i>Rubus</i> | <i>argutus</i> | ROSACEAE | Florida blackberry | shrub | 2 |

Table 2. (continued)

| Genus | Species | Family | Common Name | Life Form | Invasive? |
|--------------------|-------------------|------------------|-----------------------------|-----------|-----------|
| <i>Rubus</i> | <i>niveus</i> | ROSACEAE | hill or myosore raspberry | shrub | 2 |
| <i>Rubus</i> | <i>rosifolius</i> | ROSACEAE | thimbleberry | shrub | |
| <i>Rumex</i> | <i>acetosella</i> | POLYGONACEAE | sheep sorrel | herb | |
| <i>Sacciolepis</i> | <i>indica</i> | POACEAE | Glenwood grass | grass | |
| <i>Setaria</i> | <i>gracilis</i> | POACEAE | yellow foxtail | grass | |
| <i>Sonchus</i> | <i>oleraceus</i> | ASTERACEAE | sow thistle | herb | |
| <i>Sporobolus</i> | <i>africanus</i> | POACEAE | smutgrass, African dropseed | grass | |
| <i>Verbascum</i> | <i>thapsus</i> | SCROPHULARIACEAE | mullein | herb | |
| <i>Vulpia</i> | <i>bromoides</i> | POACEAE | brome fescue | grass | |