

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843



October 25, 2002

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Deputy Manager and Chief Engineer

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

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact for the Board of Water Supply's
Proposed Kalaniana'ole Highway 36-Inch Water Main Project, Waimanalo,
Hawaii, TMK: 4-01-08, 09, 13, 15, 18, 22-24, 26, 28 and 32

The Board of Water Supply has reviewed the comments received during the public comment period which began on July 8, 2001. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the Final Environmental Assessment (EA) and therefore, are issuing a Finding of No Significant Impact. We request that the proposed project be published as a Finding of No Significant Impact in the next Office of Environmental Quality Control (OEQC) Bulletin.

We have enclosed the following:

- Completed OEQC Bulletin Publication Form;
- Four (4) copies of the Final EA;
- Project summary (for publication in the Environmental Notice) and diskette.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL
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Enclosures

cc: Kimura International, Inc.

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**FINAL
ENVIRONMENTAL ASSESSMENT**

(Kalaniana'ole Highway
36-Inch Transmission Main)

Waimanalo to Olomana Golf Links
Phases I & 2



BOARD OF WATER SUPPLY
City and County of Honolulu

October 2002

**FINAL
ENVIRONMENTAL ASSESSMENT**

Kalaniana'ole Highway
36-Inch Transmission Main

Waimanalo to Olomana Golf Links
Phases 1 & 2

Prepared for:



BOARD OF WATER SUPPLY
City and County of Honolulu

Prepared by:



KIMURA INTERNATIONAL INC.

October 2002

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- A: Environmental Noise Assessment Study by D.L. Adams Associates, Ltd., dated September 28, 2000
- B: KALANIANA'OLE Highway: 36-inch Main, Waimanalo to Olomana, Botanical Resources Assessment by Char and Associates, Letter report dated August 16, 2000
- C: Wildlife Survey, Kalaniana'ole Highway: 36-inch Main, Waimanalo to Olomana, Phase 1 and 2 by Tim J. Ohashi, dated July 17, 2000
- D: Letter from the State Historic Preservation Division, dated December 8, 1999

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PREFACE

Preface

The Final Environmental Assessment incorporates comments received during the public review period. Substantive revisions to the Draft Environmental Assessment are shown with italicized text for additions and a line through the text for deletions.

1 INTRODUCTION

1.1 PROPOSING AGENCY AND ACTION

The Board of Water Supply (BWS), City and County of Honolulu, proposes to install a water transmission main that is 36 inches in diameter or smaller in the public right-of-way through portions of Waimanalo. The proposed route extends from the entrance of Olomana Golf Links along Kalanianaʻole Highway to its intersection with Poalima Street. The route then continues from Poalima Street onto Hihimanu Street where it terminates at about the Nonokio Street intersection. The proposed pipeline measures approximately 10,400 lineal feet or two miles.

This project provides a segment of pipeline that will connect two similarly sized, 36-inch transmission mains that were previously installed in Kalanianaʻole Highway and Hihimanu Street. The new main will provide reliability of service until such time as an existing 20-inch water main is taken out of service. In addition to the new main, the project includes valve vaults for connections to existing mains and other interconnections, installation of new fire hydrants and laterals, relocation of some water meters, and drainage and stream crossings.

1.2 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

Under Chapter 343, Hawaii Revised Statutes (HRS), Act 241, Session Laws of Hawaii (SLH) 1992, and Chapter 200 of Title 11, Department of Health (DOH) Administrative rules, "Environmental Impact Statement Rules," the proposed project involves the use of public funds and is therefore subject to the environmental review process. The BWS is a semi-autonomous agency of the City and County of Honolulu and will fund the project through its Capital Improvement Program. This environmental assessment (EA) has been prepared to address potential impacts that may occur during construction and/or operation of the proposed 36-inch transmission main. Findings of the assessment are used to determine the project's significance.

1.3 PERMITS REQUIRED OR POTENTIALLY REQUIRED

Governmental permits needed to implement the proposed action are listed in Table 1.

For the stream crossings, a stream channel alteration permit must be obtained from the State Dept. of Land and Natural Resources and a Section 10 or Nationwide permit is needed from the Army Corps of Engineers. The federal permit will trigger a coastal zone management consistency review by the State Office of Planning, *and possibly a National Historic Preservation Act, Section 106 Review.*

If the stream crossing extends beyond the public right-of-way, a Special Management Area (SMA) permit will be needed from the City and County of Honolulu Department of Planning and Permitting.

Table 1: Government Permits and Approvals

Type	Agency
Department of the Army Permit	Dept. of Army with concurrence from State Department of Health
<i>Endangered Species Act, Section 7 Consultation</i>	<i>U.S. Fish and Wildlife Service</i>
<i>National Historic Preservation Act, Section 106 Review</i>	<i>State Historic Preservation Division, Dept. of Land and Natural Resources</i>
Coastal Zone Management Consistency Review	State Office of Planning
Stream Channel Alteration Permit	State Dept. of Land and Natural Resources
Section 401 Water Quality Certification	State Department of Health Clean Water Branch
National Pollutant Discharge Elimination System (NPDES) Notice of Intent for storm water related to construction activity (Form C), hydrotesting (Form F), and construction activity dewatering effluent (Form G)	State Department of Health Clean Water Branch

SECTION 1

INTRODUCTION

Type	Agency
Noise permit	State Department of Health, Noise, Radiation, and Indoor Air Quality Branch
Review of construction drawings and request for right-of-entry for portions of proposed project within State highway right-of-way Review and approval of a traffic control plan Lane closure permits, as needed	State Department of Transportation
Special Management Area (SMA) Permit	City and County of Honolulu, Department of Planning and Permitting
Construction permit/trenching permit Dewatering permit	City and County of Honolulu, Department of Planning and Permitting, Civil Engineering Branch
Review of construction drawings and request for right-of-entry for portions of proposed project within City highway right-of-way Review and approval of a traffic control plan Street usage permits, as needed	City and County of Honolulu Department of Planning and Permitting

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2. PROPOSED ACTION

2.1 PROJECT DESCRIPTION AND LOCATION

The BWS proposes to install a 36-inch or smaller water transmission main in Waimanalo, on the eastern shore of Oahu. Approximately 10,400 lineal feet of pipeline will be laid within portions of Kalaniana'ole Highway, Poalima Street, and Hihimanu Street (see Figure 1). Construction will occur in the public right-of-way, except at the stream crossings where the alignment may extend outside the right-of-way. In this event, easements must be obtained from the State of Hawaii and/or private landowners.

Jurisdiction of the roadways that are directly affected by the proposed project:

State (DOT)	City
Kalaniana'ole Highway	Poalima Street Hihimanu Street

Jurisdiction of roadways adjacent to the proposed project:

State (DOT)	City	Private*
Saddle City Road	Kumuhau Street Humuniki Street Mekia Street Kakaina Street Lukanela Street Mokulama Street Ahiki Street Nonokio Street	Flamingo Street Poalima Place

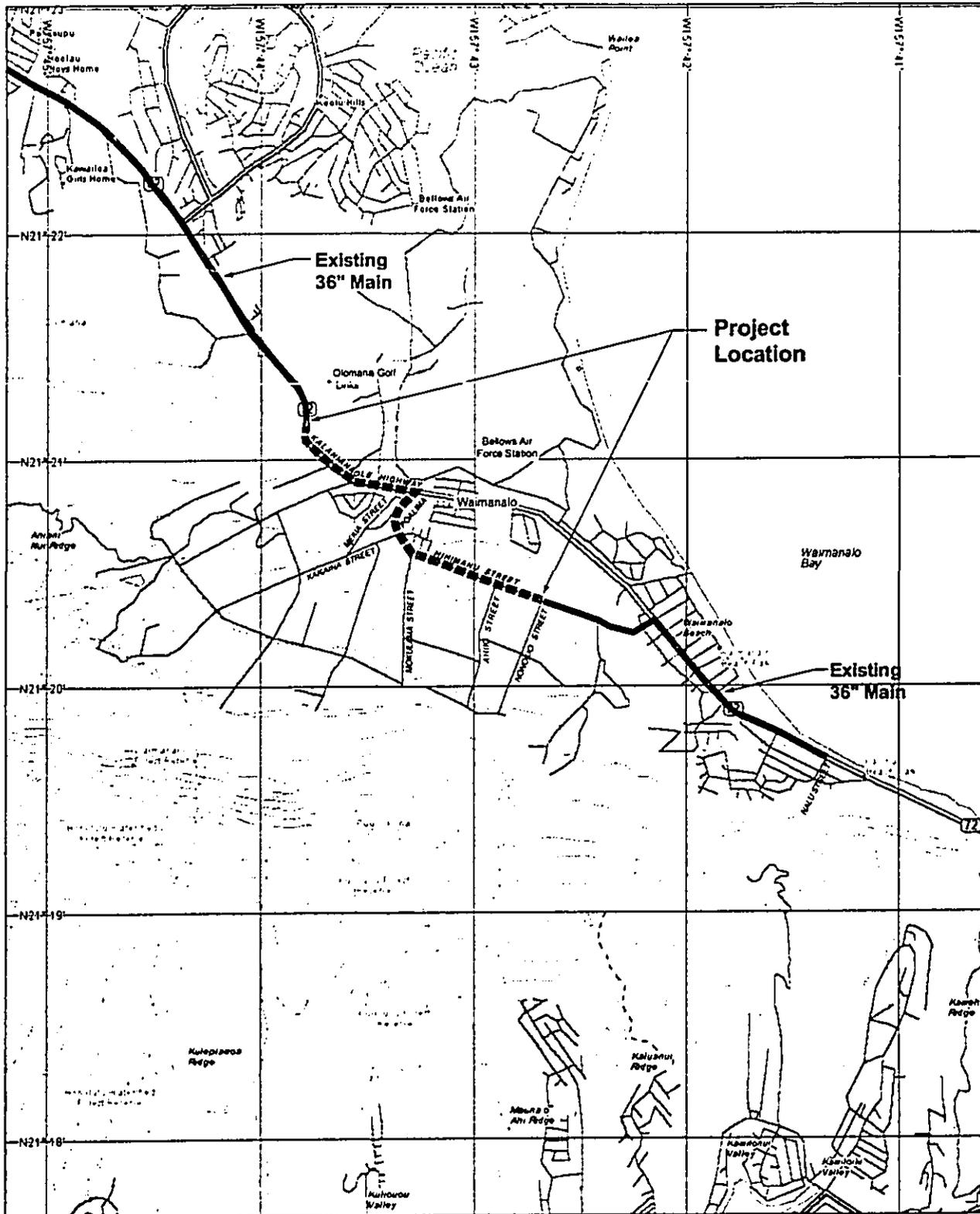
* Private street maintained by the City on a first-aid basis only and not fully maintained as City roads.

The proposed action is located in an area surrounded by a variety of land uses, including a golf course and undeveloped land, single-family residences, small-scale commercial developments that make up Waimanalo Town, agricultural farm lots, the Job Corps Center, and the Waimanalo District Park.

2.2 PROJECT PURPOSE

At present, there is a 36-inch water main that extends south from Pohakupu to the entrance to Olomana Golf Links. There is also a 36-inch water main extending north from Makapuu and ending at the intersection of Hihimanu Street and Nonokio Street (see Figure 1). Between these two points, the existing network consists of a 20-inch water main and distribution lines of varying diameters. The purpose of the proposed transmission main is to connect the two existing 36-inch transmission main sections on either side of the project boundaries. It is needed to provide reliability of service until such time as the existing 20-inch main is taken out of service.

The 20-inch main is a concrete cylinder pipe. While it remains active, the new main would provide insured reliability to local customers with potable water in the event of a water main break or servicing to the existing 20-inch main. The existing 20-inch main is 40 years old and has experienced four breaks within the project area, one occurring on December 18, 2000. The repair of a broken main may take a day or even longer to complete, during which customers may experience significant inconvenience.



Source: USGS Topographic Map



Figure 1

Location Map

Board of Water Supply
 Kalaniana'ole Highway 36-inch Main
 Waimanalo to Olomana

June 2002

2.3 TECHNICAL DESCRIPTION OF THE PROJECT

The project is planned in two phases. Phase 1, along Kalanianaʻole Highway will start from the entrance drive to Olomana Golf Links and extend approximately 4,500 feet to the intersection of Poalima Street. Phase 2 continues along Poalima Street for approximately 900 feet, curves along Hihimanu Street then extends another 5,000 feet to the intersection with Nonokio Street where the Pohakapu Line Booster is located (see Figure 2). *The proposed water main will be located as close as possible to the edge of the State right-of-way.*

The project scope includes the installation of a 36-inch or smaller transmission main, valve vaults for connections to existing mains and other interconnections, installation of new fire hydrants and laterals, relocation of some water meters, and drainage and stream crossings. Air relief valves will also be installed along the new transmission main. For the majority of Phases 1 and 2, the transmission main will be installed on the makai side of the proposed alignment.

Installation of the water main will follow commonly used construction methods including saw-cutting and trenching of the roadways. Trench work will be done in increments, typically 150-400 feet at a time. When completed, the water main will be buried in the roadways with a minimum cover of three feet throughout its length. A typical cross-section view of the trench for the water main is shown in Figure 3.

Two streams must be crossed in the Kalanianaʻole Highway phase of the project: Waimanalo Stream and Kahawai Stream. According to the *Hawaii Stream Assessment* (1990), Waimanalo Stream is identified as a perennial stream. Kahawai Stream is a tributary of Waimanalo Stream and is not listed as a perennial stream. Both streams have been channelized for flood control and are lined with concrete in the project area. An open-cut installation method will be used to lay the pipeline beneath the stream channels. *The project stream crossing alignment and design will be coordinated with the State DOT, Highways Division, Bridge Design Section as to not interfere with future rehabilitation of existing bridges.*

After each increment is completed, the main must undergo hydrostatic testing and chlorination to disinfect the line. These procedures will be conducted according to the BWS's specifications (*Water System Standards*, BWS, 2002) and applicable Federal, State, and County requirements. Prior to construction, the contractor will prepare a plan indicating the locations and amounts of effluents to be discharged and submit it to the State Department of Health for review and approval.

The contractor will schedule work activity between the hours of 8:30 a.m. and 3:00 p.m., Monday through Friday, excluding State holidays. Any construction outside these hours will require approval by the State Department of Transportation. At least one through-lane of traffic will be open during periods of construction in accordance with an approved traffic

control plan. Trenches will be covered during non-working hours with safe, non-skid bridging material to accommodate all types of vehicular traffic. Safety of the bridging material will be met by ensuring that no more than the maximum permissible trenching width and length required for structural support will be exposed at any one time. In addition, the contractor will provide adequate access to and from driveways and public streets. Off-duty police officers and/or contractor personnel will be used to control the flow of traffic around the construction area.

The contractor will perform all applicable construction work in accordance with the Board of Water Supply System Standards and the Standard Specifications for Public Works Construction (September, 1986) of the City and County of Honolulu, and the Revised Ordinances of Honolulu (ROH), 1978 as amended.

Construction and restoration of the existing roadway will be performed in accordance with all applicable sections of the "Standard Specifications for Road and Bridge Construction" (1994) and "Standard Specifications for Public Works Construction" (1986). All work will also conform with the "Administrative Rules of Hawaii Governing the Use of Traffic Control Devices at Work Sites On or Adjacent to Public Streets and Highways" and the Manual of Uniform Traffic Control Devices for Street Maintenance Operation."

2.4 PROJECT SCHEDULE AND COST

The construction period is expected to last approximately twelve to eighteen months for each of the two phases. ~~Construction phases may overlap and Phase 2 may start before Phase 1. Construction work is tentatively scheduled for fiscal year 2002.~~ Construction work for Phase 1 is tentatively scheduled for fiscal year 2004 to coincide with a Department of Transportation project to improve Kalaniana'ole Highway. Phase 2 of the project, along Hihimanu Street from Kalaniana'ole Highway to Nonokio Street, has not been scheduled for construction. A 36-inch main is estimated to cost approximately \$4.8 million for Phase 1 and \$6.3 million for Phase 2. Costs would be lower if the final design calls for a smaller diameter pipeline, possibly 30, 24, or 20 inches. Funds will be budgeted through the BWS's Capital Improvement Program.

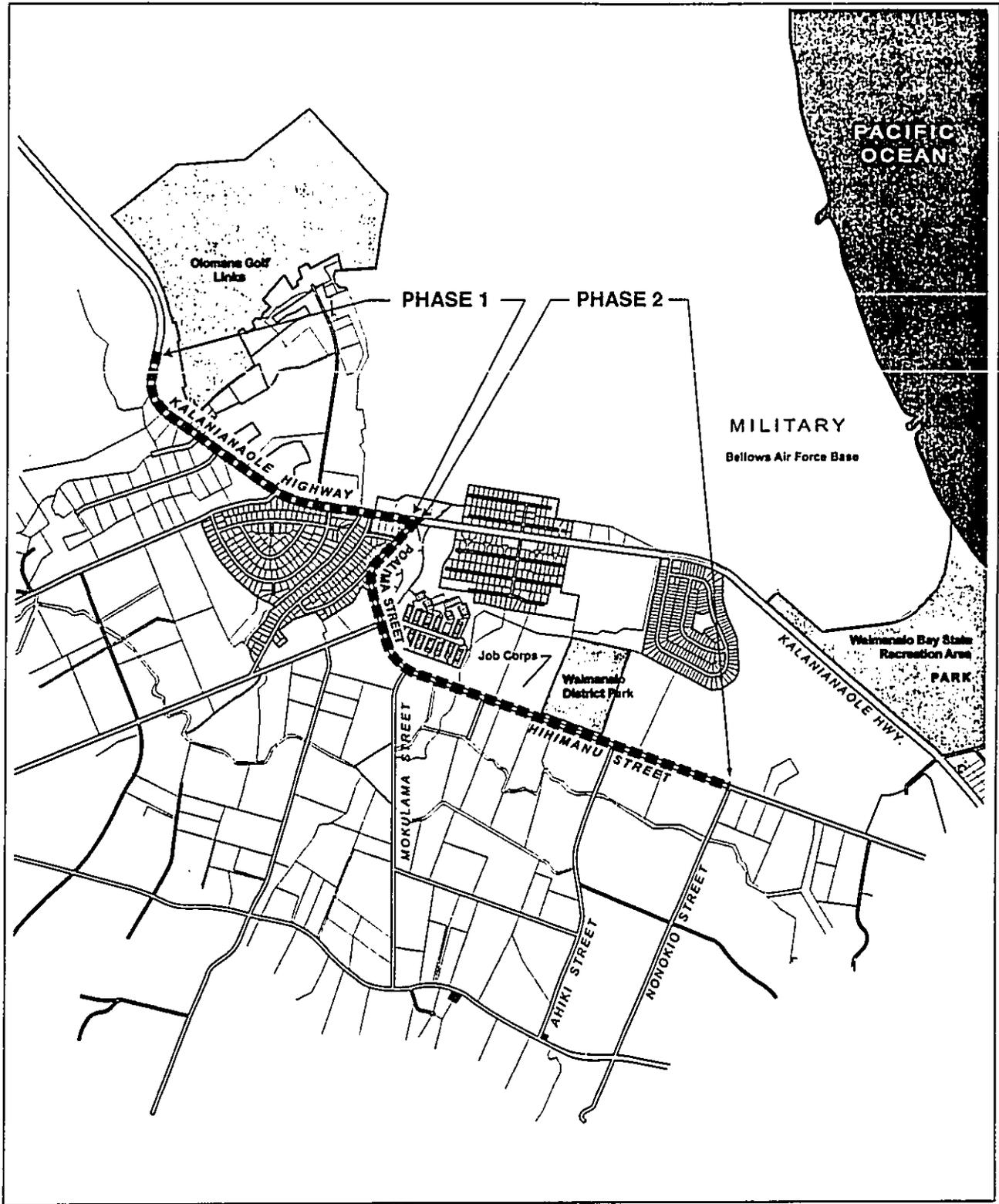


Figure 2
Project Alignment Map

Board of Water Supply
 Kalaniana'ole Highway 36-inch Main
 Waimanalo to Olomana

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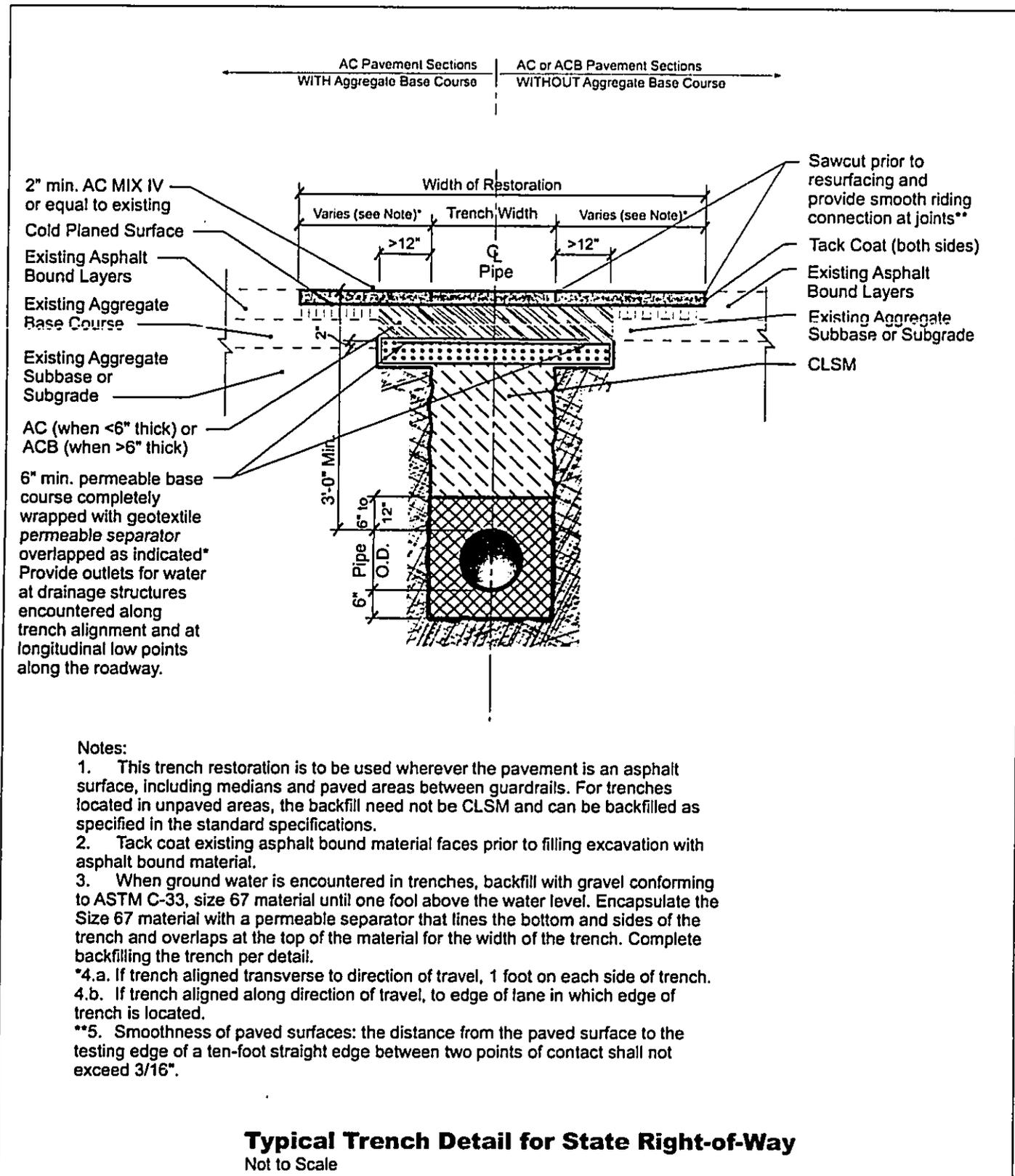
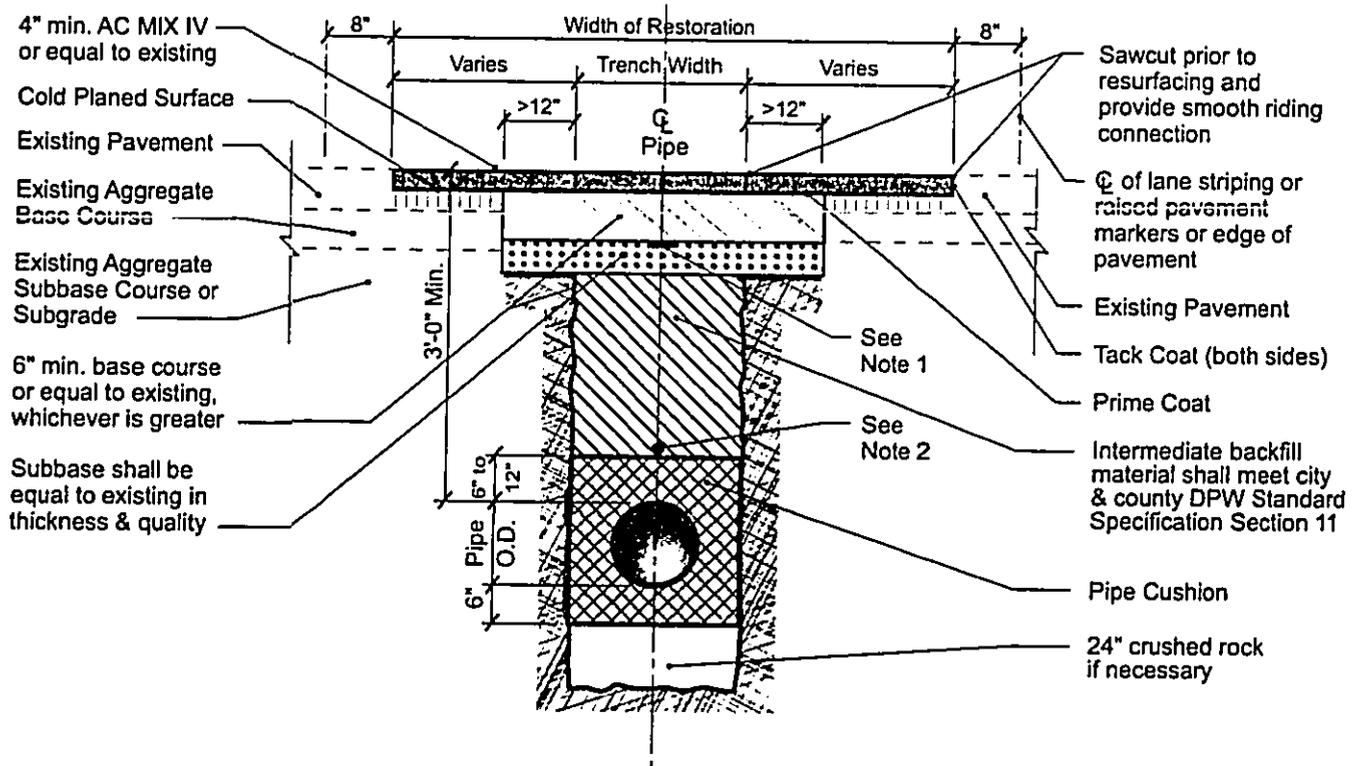


Figure 3A

Typical Trench Cross Sections - State ROW

Board of Water Supply
Kalaniana'ole Highway 36-inch Main
Waimanalo to Olomana



Notes:

1. Install 4 mil thick, non-metallic, blue colored, 6" wide warning tape over centerline of pipe and below the base course along the entire length of trench. Tape should be marked with "caution water line buried below." Payment for the furnishing and installation of the warning tape shall be incidental to the unit price bid for the pipe.
2. Install No. 8 GA copper toning wire over centerline of PVC pipes at 2'-6" max. from finish grade.

Typical Trench Detail for City Right-of-Way
Not to Scale

Figure 3B
Typical Trench Cross Sections - City ROW

Board of Water Supply
Kalaniana'ole Highway 36-inch Main
Waimanalo to Olomana

2.5 PROJECT SUMMARY

Table 2 contains a description of the project and applicable land-use restrictions.

Table 2: Project Summary

Item	Data
Tax Map Keys	4-1-08, 09, 13, 15, 18, 22, 23, 24, 26, 28, 32
State Land Use Designations	Urban
Development Plan Land Use Designations	Agriculture, Residential, Commercial, Public Facility, Park
Zoning Designations	AG-1 Restricted, AG-2 General, C Country, R-5 Residential, B-1 Neighborhood Business
Flood Insurance Rate Map	Zone X, Zone XS, Zone AE
Length and Diameter of Water Line	10,400 feet long; 36 inches or less in diameter
Landowners	State of Hawaii, City and County of Honolulu (Note: easements from the State of Hawaii and/or private landowners may be needed for the stream crossings)

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3 AFFECTED ENVIRONMENT

3.1 PHYSICAL ENVIRONMENT

3.1.1 Geology

The geology of Waimanalo is generally characterized by three types of landforms: basaltic bedrock, alluvium, and coralline deposits. Basaltic bedrock defines the western, southern, and eastern boundaries of the Waimanalo area, and generally consists of basaltic flows and dikes of the Koolau dike complex (Harding Lawson Associates, 1992). Alluvium generally lies at the foot of the basalt and primarily consists of highly weathered basaltic sand, gravel, cobbles, and boulders in a matrix of non-calcareous clays and silts. Marine calcareous deposits are expected to occur seaward of the alluvium and generally consist of recent beach and dune sand and other coralline deposits, including older lithified dunes. The alluvium is typically interlaid with coralline deposits in the area. Along the coastline, in the extreme eastern part of the Waimanalo area, the lithified coralline deposits are overlain by lavas and pyroclastic material from ancient volcanic eruptions.

The geology of the proposed alignment primarily consists of non-calcareous sediments, chiefly comprised of clayey alluvium including marine sediments and talus. A portion of the project contains calcareous sediments consisting of beach sand, dune sand, coral and coral rubble, and outcrops of dune and coral limestone.

3.1.2 Soils

There are six soil types within the project area, as identified by the U.S. Department of Agriculture Soil Conservation Service. Figure 4 shows the general locations of various soils along the route of the proposed transmission main. Soil types in the area of the proposed alignment include:

Papaa clay, 6 to 20 percent slopes (PYD)

The Papaa series consists of well-drained soils on uplands. These soils formed in colluvium and residuum derived from basalt. They are moderately sloping to very steep, and occur on elevations ranging from nearly sea level to 500 feet. On this soil, runoff is slow to medium and the erosion hazard is slight to moderate.

Kaloko clay, noncalcareous variant (K1B)

The Kaloko series consists of poorly drained soils. These soils developed in alluvium derived from basic igneous rock. They are nearly level, with elevations ranging from sea level to 20 feet. This soil occurs in slight depressions on the coastal plains of Oahu. It is more acid and grayer than is typical of the Kaloko series, and it is

underlain by noncalcareous material. Permeability is slow, runoff is ponded to very slow, and the erosion hazard is none to slight.

Hanalei silty clay, 0 to 2 percent slopes (HnA)

The Hanalei series consists of somewhat poorly drained to poorly drained soils on bottom lands. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping and elevations range from nearly sea level to 300 feet. This soil is on stream bottoms and flood plains. Permeability is moderate. Runoff is slow, and erosion hazard is no more than slight.

Pohakupu silty clay loam, 0 to 8 percent slopes (PkB)

The Pohakupu series consists of well-drained soils on terraces and alluvial fans. These soils formed in old alluvium derived from basic igneous material. This soil has smooth slopes and occurs on terraces and alluvial fans and slopes are mainly 3 to 8 percent. Permeability is moderately rapid, runoff is slow, and erosion hazard is slight.

Waialua clay, 2 to 6 percent slopes (WnB)

The Waialua series consists of moderately well drained soils on alluvial fans. These soils developed in alluvium weathered from basic igneous rock. They are nearly level to steep, with elevations ranging from 10 to 100 feet. On this soil, runoff is slow and the erosion hazard is slight.

Haleiwa silty clay, 2 to 6 percent slopes (HeB)

The Haleiwa series consists of well-drained soils on fans and in drainage ways along the coastal plains. These soils developed in alluvium derived from basic igneous material and are nearly level to strongly sloping. Elevations range from sea level to 250 feet. On this soil, runoff is slow and the erosion hazard is slight.

Subsurface Conditions

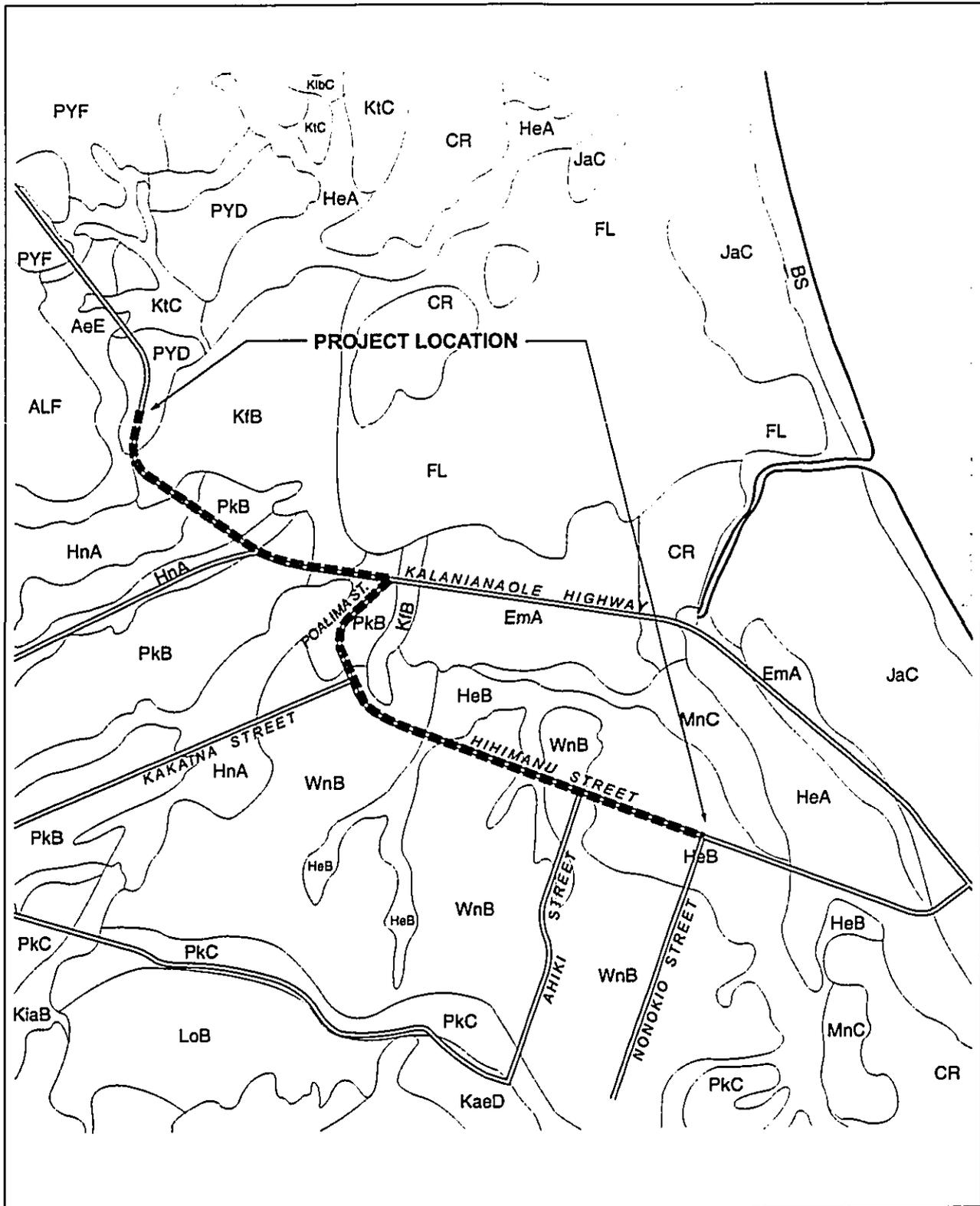
Borings were drilled in seven locations to determine surface and subsurface conditions along the alignment.¹ Boring Nos. 1 through 4 were located on either side of Waimanalo Stream and Kahawai Stream. Boring No. 5 was located at the intersection of Kalaniana'ole Highway and Poalima Street. Boring No. 6 was located on Hihimanu Street near Mokulama Street and Boring No. 7 was located at the intersection of Hihimanu Street and Nonokio Street. Borings 5 through 7 were located at the approximate sites of proposed valve vaults.

¹ Geotechnical engineering exploration performed by Geolabs, Inc. Report dated December 5, 2000.

The borings indicate that Waimanalo Stream is generally underlain by medium dense fill to depths of about 4 feet below the existing ground surface. Below this and extending to depths of 40-50 feet is a thick layer of soft to medium stiff silty clay. Below the silty clay layer to about 76.5 feet below the surface is a deposit of stiff to very stiff alluvium, consisting of silty and sandy soils. Groundwater was encountered in the borings at depths of about 10 feet below the existing ground surface.

The Kahawai Stream site is generally underlain by a thin, stiff crust over a layer of soft to medium stiff clay to depths of about 40 feet below the existing ground surface. This softer clay layer is underlain by stiff to very stiff silty clay interspersed by thin gravel layers extending to 76.5 feet below the existing surface. Groundwater was encountered in the borings at depths of about 10 feet below the surface.

Three borings were also taken in the vicinity of proposed valve vaults. The samples indicate a layer of medium stiff to stiff silty clay to depths of about 8-9 feet below the existing ground surface. The silty clay layer is generally underlain by alluvium consisting of very soft to medium stiff clayey silt, or hard sandy silt and dense silty gravel, extending to the maximum 21.5-foot depth explored. The boring near the intersection of Kalaniana'ole Highway and Paolima Street, relatively near Kahawai Stream, encountered groundwater at a depth of 15 feet. A 21.5-foot boring on Hihimanu Street, east of Mokulama Street, found no groundwater. The easternmost boring, near the intersection of Hihimanu Street and Nonokio Street, encountered groundwater at 0.5 foot below the existing ground surface. The geotechnical engineers note that water levels at the project site are influenced by seasonal precipitation, storm surge conditions, and other factors.



Source: Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii



Figure 4
Soils Map

Board of Water Supply
Kalaniana'ole Highway 36-inch Main
Waimanalo to Olomana

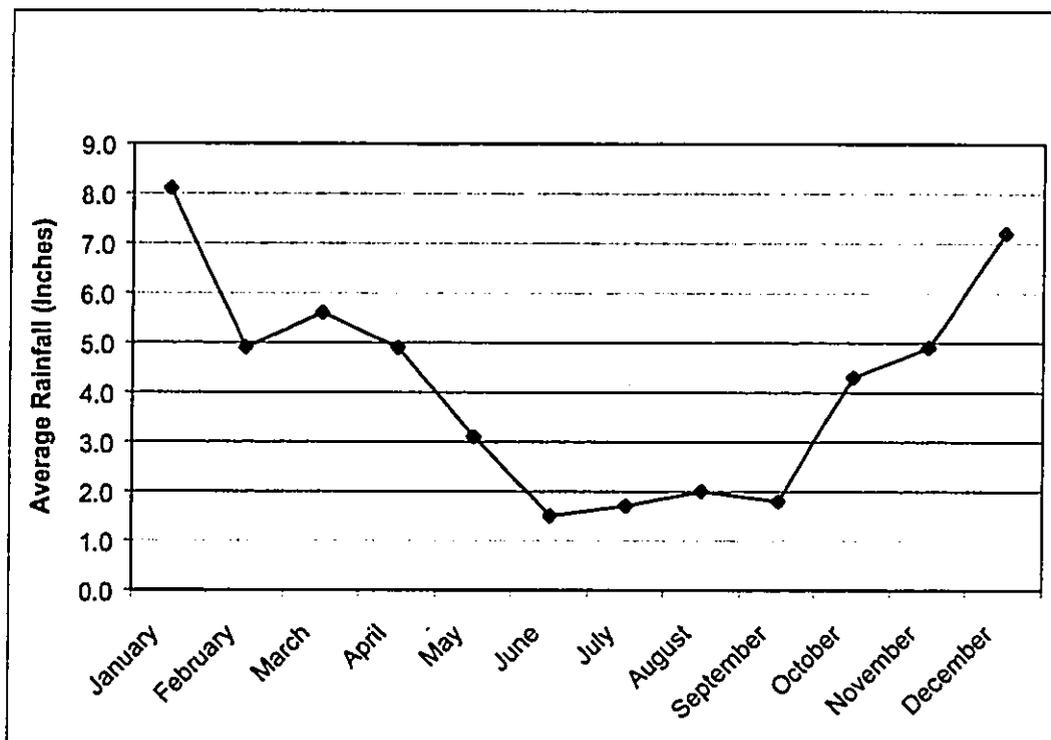
June 2002

3.1.3 Climate and Air Quality

Weather conditions at the project area are typical of the mild subtropical climate of Oahu. Temperatures in the area are generally mild and uniform, with monthly average temperatures ranging from 70 degrees Fahrenheit in January to 78 degrees Fahrenheit in August.

Average annual rainfall in the Waimanalo watershed varies with elevation and ranges from approximately 40 inches at sea level to approximately 100 inches in the Koolau Mountain Range. The project area is near sea level and has an average rainfall of approximately 50 inches per year. There is also seasonal variation in rainfall. The wet season generally extends from November 1 through April 30 and averages 6 inches per month. During the dry season, from May 1 through October 31, rainfall averages 2 inches per month (see Figure 5).

Figure 5: Rainfall in Waimanalo



Source: National Weather Service, Honolulu Forecast Office

Prevailing winds are northeasterly trade winds, which occur approximately 70 percent of the time. Trade wind frequency ranges from about 45 percent in January to more than 90 percent in July. High winds can occur during the winter months.

According to the State Department of Health, Waimanalo is not situated within an air quality maintenance or non-attainment area. Vehicular traffic is the major source of air pollutants; however, the impact is not considered to be significant given the rural character of the area. Prevailing northeast trade winds also help to keep pollution levels low.

3.1.4 Natural Hazards

Flood Zone

The State of Hawaii Civil Defense Tsunami Evacuation Zone Map and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicate that portions of the project site are vulnerable to inundation².

The Tsunami Evacuation Zone Map indicates that a portion of the Kalaniana'ole Highway right-of-way, between Saddle City Road and Poalima Street, borders the Tsunami Evacuation Zone.

According to the Federal Emergency Management Agency (FEMA)–Flood Insurance Rate Map (FIRM), portions of the alignment along Kalaniana'ole Highway and Hihimanu Street fall within Zones A and AE, which are identified as special flood areas subject to inundation by a 100-year flood. Other areas along the proposed alignment are less vulnerable as they are located within areas designated Zone X (other flood areas determined to be outside the 500-year flood plain) and Zone XS (other flood areas of the 500-year flood; areas of 100-year flood with average depth of <1 foot) (Figure 6).

Seismic Activity

The Uniform Building Code (UBC) provides minimum design criteria to address potential for damages due to seismic disturbances. The UBC scale is rated from Seismic Zone 1 through Zone 4, with 1 the lowest level for potential seismic induced ground movement. Oahu has a Seismic Zone 2A designation. In the interest of public health and safety, the BWS has adopted UBC Seismic Zone 3 standards for all its structures and projects, including this project.

² Flood Insurance Rate Map No. 15003C0380 E, effective November 20, 2000.

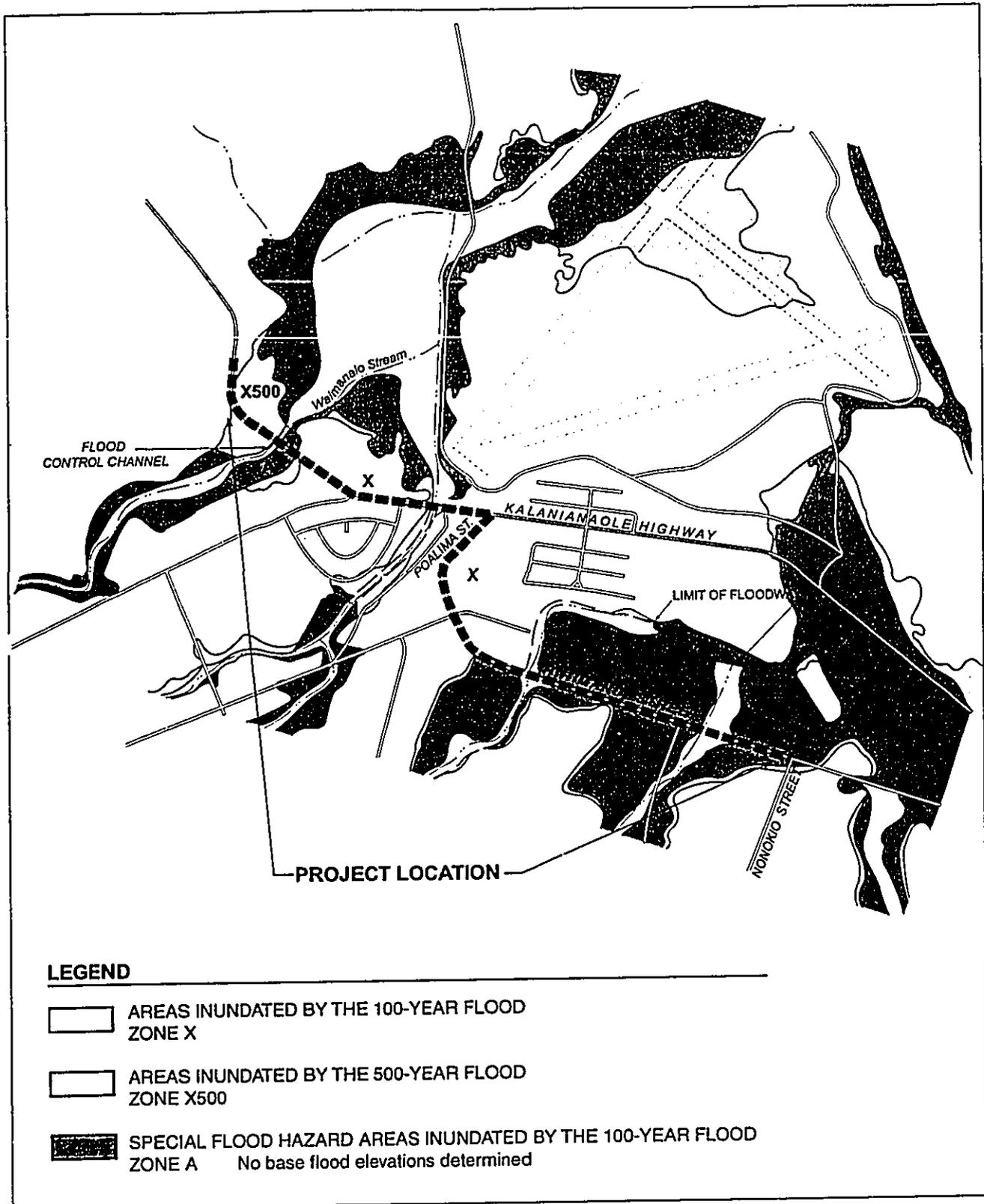


Figure 6

FEMA Flood Insurance Map

Board of Water Supply
 Kalaniana'ole Highway 36-inch Main
 Waimanalo to Olomana

June 2002

3.1.5 Hydrology

Surface Water

Two streams are located along the proposed alignment: Waimanalo Stream and Kahawai Stream. The Waimanalo Stream system is bound by the Koolau Range and Aniani Nui Ridge, with drainage into Waimanalo Bay. The system encompasses approximately 4.9 square miles and consists of a network of streams and branches. Kahawai Stream is a tributary of Waimanalo Stream. Additional forks occur upstream on both waterways.

According to *Hawaii Stream Assessment (HSA)* (1990), Waimanalo Stream is a perennial stream. The bottom of the Waimanalo Stream channel measures 52 feet wide at the Kalaniana'ole Highway bridge. Kahawai Stream is not *listed as a perennial stream in the HSA; however, the form and function of the stream channel and its vegetation characteristics indicate that it is a perennial stream.* The bottom of this stream channel measures 40 feet wide at Kalaniana'ole Highway. Except for rainy periods, both streams are characterized as having low stream flows due, in part, to the wide channels that cause water to spread out into a thin sheet.

Waimanalo and Kahawai Streams are lined with concrete in the project area (on both the mauka and makai sides of their respective bridges). Vegetation along the stream banks is cut periodically to provide an open channel. However, a field visit in September 2000 found dense vegetation growth in the unlined streambed, including California grass and wild sugar cane (see photos).

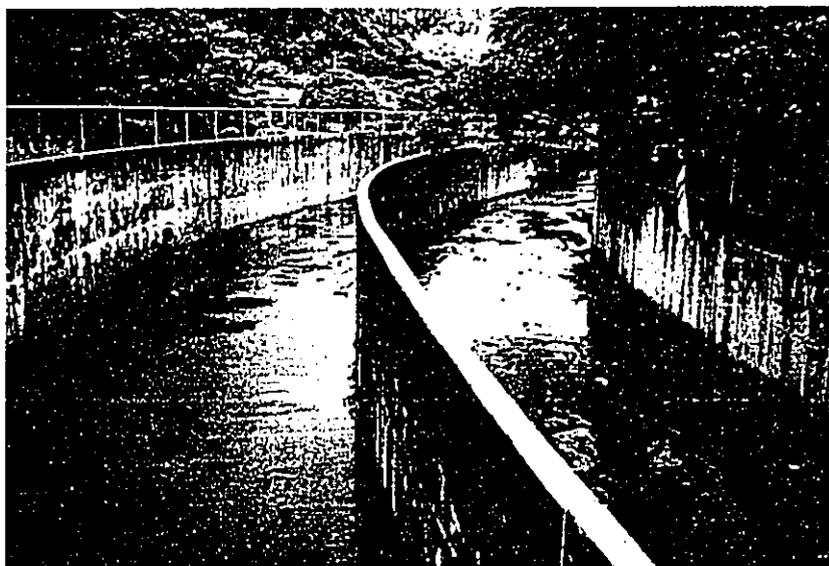


Photo 1, Mauka side of Waimanalo Stream Bridge, at Kalaniana'ole Highway with concrete wall dividing stream channel.

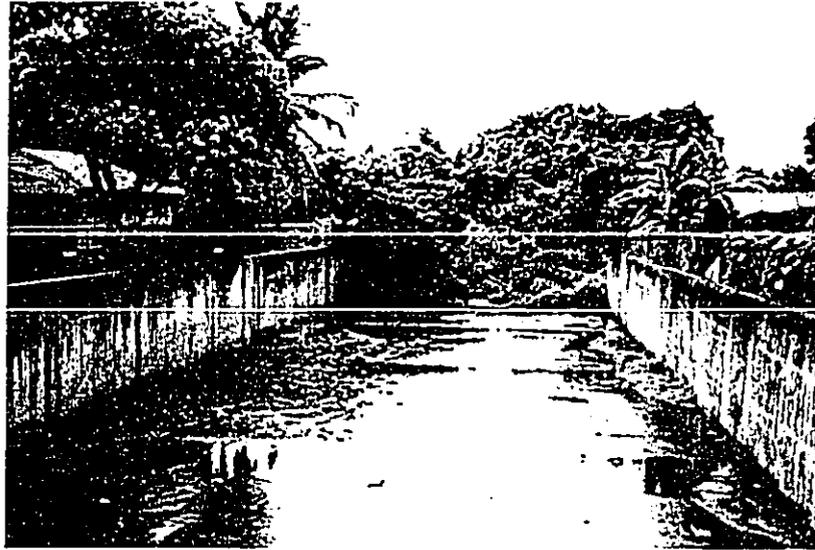


Photo 2, Makai side of Waimanalo Stream Bridge, at Kalaniana'ole Highway with vegetation intruding into the stream bed downstream.

Waimanalo Stream is categorized as Class 2 waters by the State Department of Health for purposes of establishing water quality-based controls. Designated uses for Class 2 streams include recreation, propagation of fish, shellfish, and other aquatic life, and agricultural and industrial water supply.

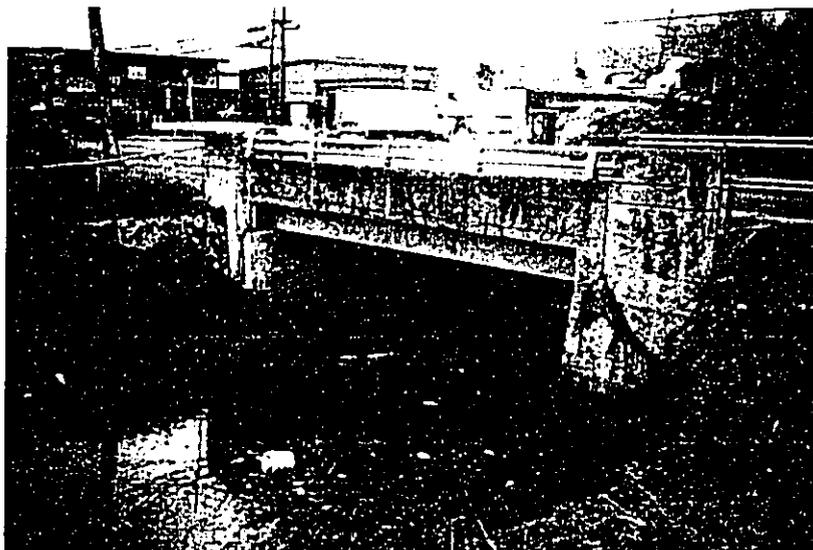


Photo 3, Kalaniana'ole Highway bridge crossing at Kahawai Stream (makai side).

Groundwater

Three major hydrologic units occur in the Waimanalo area:

- Higher-level water in dike-intruded lava flows in the upper mountain regions
- Basal water in dike complexes in the coastal plains
- Basal water in coastal plain sediments

Dikes are dense, poorly permeable remnant conduits through which lava extruded from the Koolau volcanic shield. Rainfall infiltrating in the mountain regions is retained within these dikes that cut across the lava flows. The permeable compartments behind the dikes form natural reservoirs for groundwater. This groundwater is not in contact with seawater and is commonly described as high-level water.

In the coastal regions, the dike complex underlies alluvium and coastal plain deposits. These deposits form a cap over the dike complex that confines the groundwater under artesian pressure. This groundwater is commonly described as basal water.

Basal groundwater also occurs at shallow depth in the sedimentary deposits underlying the coastal plain in the Waimanalo area. The groundwater floats on the heavier seawater due to the density difference between fresh water and saline water. The fresh water characteristically forms a lens-shaped body floating over the saline water. The fresh water lens is dynamic due to variations in water discharge from pumpage, tidal action, and recharge.

Small amounts of groundwater may occur as seeps through joints in the bedrock and at contacts between soil and rock or between dissimilar soils. It is possible that some of this groundwater may be encountered during construction trenching. Such groundwater would need to be removed during pipeline installation to ensure dry working conditions.

3.1.6 Noise Quality³

Twenty-four hour noise level measurements were conducted to assess the existing acoustical environment along the roadways of the project. The measurements were taken at three locations:

- 1) Kalaniana'ole Highway near Waimanalo Stream crossing
- 2) Kalaniana'ole Highway near Kahawai Stream crossing
- 3) Hihimanu Street near the "Y" intersection with Poalima Street

Results of the noise readings are shown in Table 3. Traffic was the dominant contributor to the noise measurements.

³ Environmental noise impact study prepared by D.L.Adams Associates, Ltd. Report dated Sept. 28, 2000 (see Appendix A).

Table 3: Day-Night Ambient Noise Levels at Three Sampling Locations, Waimanalo

Measurement Location	Date of Measurement	Minimum Nighttime Hourly L_{eq} (in dBA)	Minimum Daytime Hourly L_{eq} (in dBA)
1	6/26-6/27	51.0	60.0
2	6/27-6/28	54.0	60.5
3	7/6-7/7	46.0	51.0

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Flora⁴

In the Phase I portion of the proposed water main corridor, from the Olomana Golf Links towards the Waimanalo Stream Bridge crossing, the vegetation along the highway consists of a mowed grassy strip bordered by an area with low clumps of Guinea grass (*Panicum amaximum*), and scattered shrubs of koa haole (*Leucaena Leucocephala*), 3-7 feet tall, and young trees of 'opiuma (*Pithcellobium dulce*). Scarlet-fruited gourd or coccinia (*Coccinia grandis*), a fast-growing weedy vine, is also common to abundant.

From about Waimanalo Bridge, past Kahawai Stream, and onto Poalima Street, the corridor is bordered by a residential area. Homes border both sides of Waimanalo Stream and the stream banks are concrete lined. Homes also border Kahawai Stream. On the makai, Olomana side of the stream, there is a dirt road that is bordered by plantings of native plants which include naio (*Myoporum sandwicense*), hala (*Pandanus tectorius*), and 'a'ali'i (*Dodonaea viscosa*), and ma'o (*Gossypium tomentosum*).

Subsequent to the biological survey in August 2000, the stream restoration project at Kahawai Stream has expanded with native plants now lining both banks and the adjacent service road for a distance of more than 500 feet.

⁴ Botanical resources assessment, analysis of potential impacts, and recommended mitigation measures prepared by Char & Associates. Letter report dated August 16, 2000 (see Appendix B).

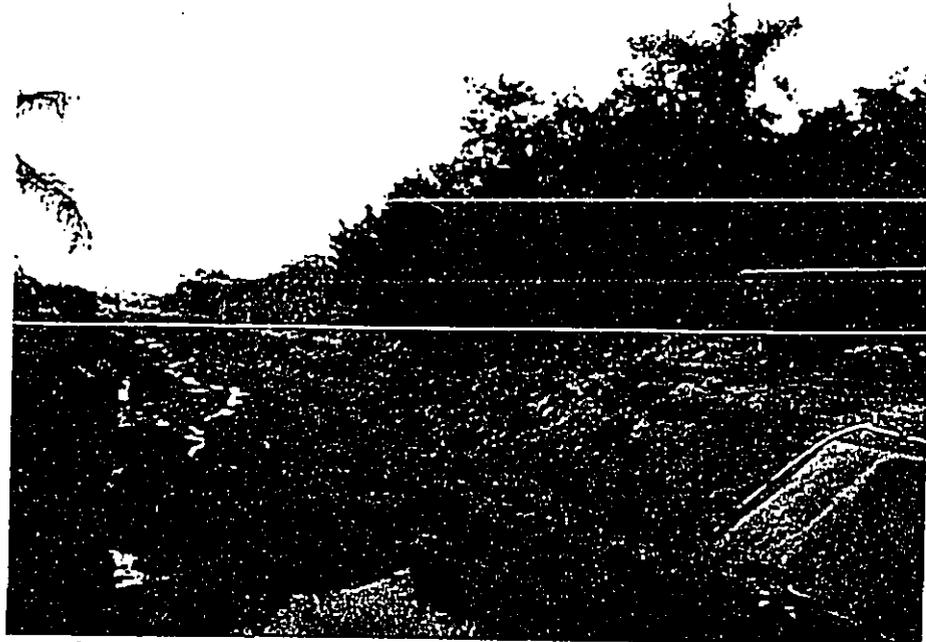


Photo A: Kahawai Stream restoration project with native plants (July 2001).

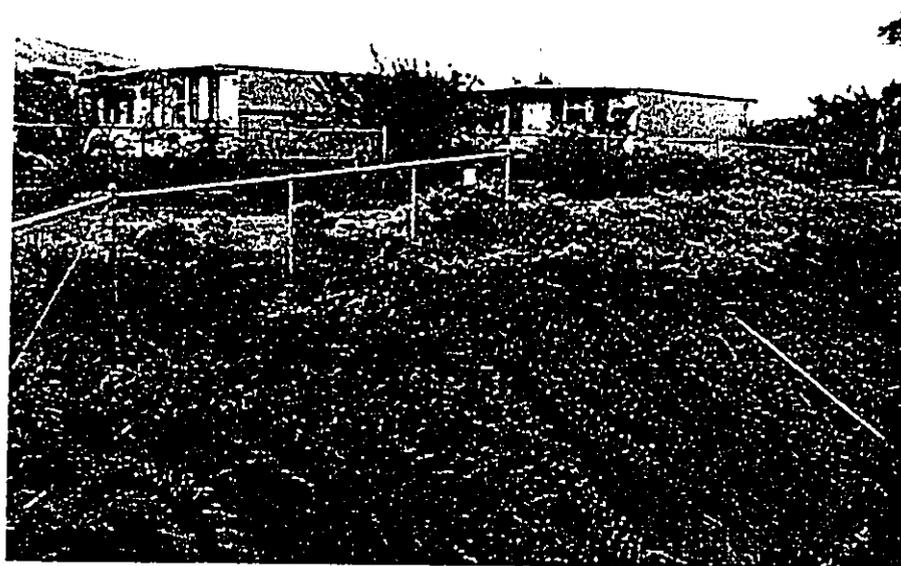


Photo B: Plantings along the stream bank (July 2001).

In the Phase 2 portion of the corridor, from Poalima Street to the intersection of Hihimanu with Mokulama Street, the proposed water main passes through a residential area. The corridor then passes over a small drainageway. The bottom of this dry drainageway contains low clumps of Guinea grass and exposed soil. Koa haole scrub lines both sides of the banks. On the mauka side of the drainageway, the koa haole scrub contains a few plants of castor bean (*Ficinus communis*) and *Syngonium auritum* vines.

From about the drainageway to its terminus at Nonokio Street, the Hihimanu Street corridor is bordered by a number of farm and plant nursery lots. The roadside is occasionally mowed or bladed and supports low mats of plants among bare soil areas. Bermuda grass or maniekie (*Cynodon dactylon*) is abundant to common. Weedy species found here occasionally include Guinea grass, scarlet-fruited gourd, field bindweed (*Ipomoea obscura*), spiny amaranth (*Amaranthus spinosus*), swollen fingergrass (*Chloris barbata*), wiregrass (*Eleusine indica*), and *Boerhavia coccinea*. Behind this strip of mowed grass and weeds is a band of koa haole scrub, 12-20 feet tall. Scattered here and there in between the koa haole shrubs are trees of fiddlewood (*Citharexylum caudatum*), Java plum (*Syzygium cuminii*), and Chinese banyan (*Ficus microcarpa*). Dense clumps of Guinea grass occur between the woody elements. In many places, a thick shroud of scarlet-fruited gourd vines drapes over the koa haole shrubs.

3.2.2 Fauna⁵

A wildlife survey was conducted at the project area on May 13, 2000⁶. The survey recorded wildlife along the proposed construction route. Seven count stations were established; one every 0.3 mile (528 yards). The count began at 5:47 a.m. and ended at 7:09 a.m. All birds seen and heard within eight minutes were recorded for each station. Incidental observations were made between stations.

The survey found the usual complement of introduced birds common to the lowlands of Oahu. The most abundant species recorded was the chestnut mannikin, although it occurred as a large flock feeding on seeds of grasses within a public park. The second most abundant species was another seedeater, the Java sparrow. It occurred at five locations but the largest number occurred in the park in association with the chestnut mannikins, nutmeg manikins, and common waxbills. The red-vented bulbul, spotted dove, common myna, and cattle egret were present at seven locations. One peafowl was heard as were many domestic chickens. The following is a list of introduced birds encountered during the field survey. They are listed in order of numbers observed.

Chestnut mannikin (*Lonchura malacca*)
Java sparrow (*Padda oryzivora*)
Red vented bulbul (*Pnycnonotus cafer*)
Spotted dove (*Streptopelia chinensis*)

⁵ Wildlife survey, impact analysis, and recommended mitigation measures prepared by Tim J. Ohashi, Certified Wildlife Biologist. Report dated July 17, 2000 (see Appendix C).

⁶ According to Tim Ohashi, May is a prime observation period because it comes in the midst of the March through August nesting season for native waterbirds.

Common myna (*Acridotheres tristis*)
Cattle egret (*Bubulcus ibis*)
Zebra dove (*Geopelia striata*)
House finch (*Carpodacus mexicanus*)
English sparrow (*Passer domesticus*)
Common waxbills (*Estrilda astrild*)
Japanese white eye (*Zosterops japonicus*)
Red crested cardinal (*Paroaria coronata*)
Northern cardinal (*Cardinalis cardinalis*)
Nutmeg mannikin (*Lonchura punctulata*)
Peafowl (*Pavo critata*)

The federally listed endangered koloa (*Anas wyvilliana*) duck was observed in Kahawai Stream. A pair was seen foraging along the concrete portion of the stream mauka of the Highway (Photo 3). One other was seen in the stream channel on the makai side (Photo 4). A native black-crowned night heron (*Nycticorax nycticorax hoactli*) was near the third koloa.

On other occasions, U.S. Fish and Wildlife and Waimanalo Water Quality Project personnel have observed Hawaiian moorhen (*Gallinula chloropus sandvicensis*) and Hawaiian gallinule ('*alae 'ula*) in the area. The streams are also known to provide habitat for the Hawaiian coot (*Fulicia alai*).

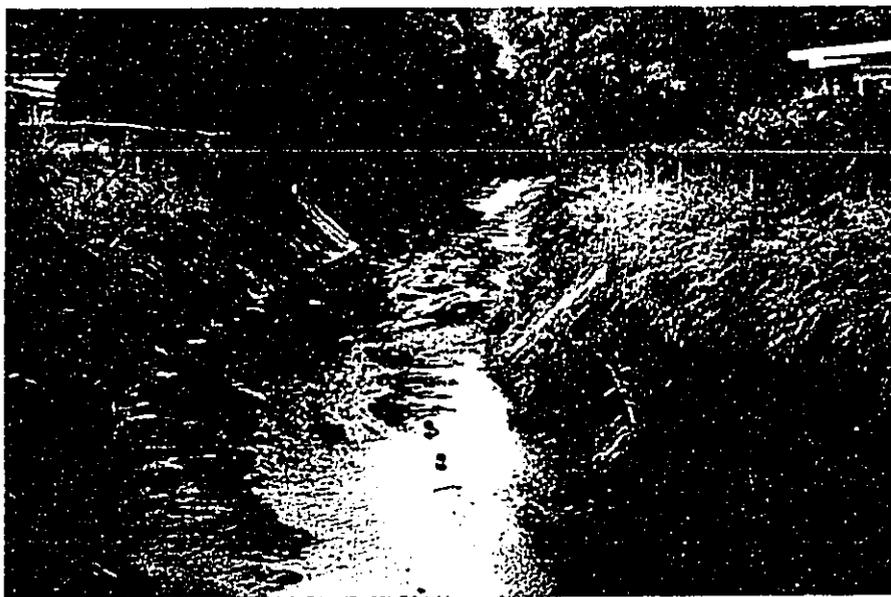


Photo 4. Pair of koloa ducks in Kahawai Stream, facing mauka



Photo 5. Koloa duck and black-crowned night heron in Kahawai Stream, facing makai

One mongoose (*Herpestes auropunctatus*) was observed along Hihimanu Street. No other mammals were seen, although there are probably feral cats (*Felis catus*), rats (*Rattus* spp), and mice (*Mus musculus*) in the area.

3.2.3 Stream Fauna

A biological assessment conducted by the Environmental Planning Office of the Hawaii Department of Health reported on habitat characteristics at 3 sites along Waimanalo Stream.⁷ None of the surveyed sites were in the BWS project area; however, the study examined the biological community in locations both above and below the Kalaniana'ole Highway bridge (which is in the project area). Site 1 was located 200 meters from the bridge on Saddle City Road (i.e., downstream from the Kalaniana'ole Highway bridge) and Site 2 was located 20 meters below the board bridge near 41-665 Kumuhau Road (i.e., upstream from the Kalaniana'ole Highway bridge). A quantitative rating method was used to evaluate nine habitat attributes. Overall scores at both Site 1 and Site 2 found the habitat "non-supporting" for aquatic life use. Reasons for the degraded conditions were fine sediment and siltation of the substrate, bank erosion, and removal of riparian vegetation.

The investigators also identified and counted fish and shellfish. Ten species were found at Site 1, including four native and six introduced. Diversity was lower at Site 2 with eight species found, of which three were native. In terms of numbers, introduced species appeared to flourish, especially more common herbivorous species such as tilapia and Poecilids. The

⁷ Stream Assessment Program, Environmental Planning Office, Hawaii Department of Health, "Biological Assessment and Habitat Characterization of Waimanalo Stream: Establishing Environmental Goals and a TMDL for Watershed Management" March 1998.

researchers concluded that Waimanalo Stream has an impaired to moderately-impaired biological community.

Another description of stream life was provided by a team of researchers from the University of Hawaii who participated in a year-long study of the Waimanalo Stream watershed in conjunction with the Department of Health (see [http:// imina.soest.Hawaii.edu/~edecarlo/waiman.html](http://imina.soest.Hawaii.edu/~edecarlo/waiman.html)). They characterized Waimanalo Stream as a hypereutrophic ecosystem with algae and ferns along the stream, a variety of small fishes and gastropods, and mats of aezolla covering parts of the stream that are stagnant.

Overall, the stream environment is relatively inhospitable to stream fauna and there are several contributing factors. First, stream flow tends to be low for much of the year. The DOH Biological Assessment reports median flow of approximately 3-5 cubic feet per second.⁸ Although Waimanalo is located on the windward side of Oahu, it receives far less precipitation than the areas of Kailua and Kaneohe. Second, the concrete-lined portions of the stream absorb heat which, combined with the lack of shade trees along the stream banks, raises the water temperature, as well as oxygen levels.⁹ Third, where the channel is not concrete-lined, vegetation grows quickly in the wet, nutrient rich environment. The resulting growth often chokes the streams, trapping sediment and causing water to back up. When vegetation is cut (or treated with herbicides), it is typically left to decompose in the streambed. All of these factors combine to increase biological stress on the Waimanalo stream system.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 Population and Employment

The study area is located within the City and County of Honolulu's Koolaupoko district and the community of Waimanalo on the Island of Oahu. According to just-released census data, 117,138 people lived in the Koolaupoko district in 2000¹⁰, compared to 117,242 in 1990. In other words, the district as a whole contracted slightly, losing approximately 100 residents over the decade. Two of the district's largest neighborhoods also experienced the largest declines: Kailua (-305) and Kaneohe (-478). In comparison, Waimanalo grew from 7,693 persons in 1990 to 7,935 in 2000.

Waimanalo has a relatively small employment base. Agriculture-related business, including dairy farms, truck farms, nurseries, and stables, make up the largest industrial sector. In

⁸ Hawaii Department of Health, *ibid.*, p. 7

⁹ Edward Laws, Professor and Chair, Department of Oceanography, University of Hawaii at Manoa, Lecture titled "Waimanalo Stream: How Over-Engineering Created a Storm Sewer/Sediment Trap" September 21, 2000.

¹⁰ Data from the U.S. Census Bureau website at www.census.gov.

addition, there are local-serving retail and service businesses in the commercial area along Kalaniana'ole Highway.

3.3.2 Surrounding Land Uses

The project area extends along Kalaniana'ole Highway from the Olomana Golf Links to the Poalima Street intersection and along Poalima Street and Hihimanu Street to the Nonokio Street intersection. A variety of land uses line both sides of these roadways. Land uses fronting Kalaniana'ole Highway include the golf course, undeveloped open areas, small-scale strip commercial developments, and single-family residences. Land uses fronting Poalima Street include a gas station and store, church, and single-family residences. Hihimanu Street is lined with single-family residences, the Job Corps Center, Waimanalo District Park, and larger agricultural lots.

3.3.3 Scenic and Visual Resources

The Waimanalo area offers a rural and agricultural setting characterized by country roads, small-scale commercial and low-density residential development, open spaces, and a variety of agricultural operations. In the project area, Kalaniana'ole Highway, Poalima Street, and Hihimanu Street provide limited amounts of open view planes. Views along the proposed corridor are of commercial enterprises and residential housing, interspersed with views of the Koolau Mountain Range, surrounding recreational areas, and limited views of the ocean.

3.3.4 Archaeological, Historic, and Cultural Resources

Seven historic and archaeological sites in the Waimanalo area are on the Hawaii and/or National Registers of Historic Places; however, none of the identified sites are located along or within close proximity to the proposed water main installation route. The pipeline corridor itself will fall within the public right-of-way which has been disturbed for roadway construction and installation of various utility lines.

3.3.5 Recreational Resources

Waimanalo District Park is a City and County facility on Hihimanu Street and located in the Phase 2 project area. The park supports a wide array of recreational activity and can draw a large number of users, especially for team athletic events. Olomana Golf Links, a privately owned golf course, is also located adjacent to the proposed alignment. A number of shoreline recreational facilities including the Waimanalo Beach Park, Waimanalo Bay Beach Park, and Bellows Field Beach Park are located to the east of the project area.

3.4 TRAFFIC AND CIRCULATION¹¹

Existing Roadway System

The proposed project will be constructed within the rights-of-way of Kalanianaʻole Highway (State Route 72) which is under the State's jurisdiction and Poalima Street and Hihimanu Street which are under the City's jurisdiction.

The proposed project, which begins near the access road to Olomana Golf Links, would construct a new water line under the makai shoulder of the existing two-lane highway. The new water line will continue under the makai shoulder for a distance of approximately 0.9 mile to the intersection of Kalanianaʻole Highway and Poalima Street. The highway provides the only public road connection into Waimanalo from the north and provides access to adjoining properties. In addition to the golf course access road, several driveways are located off the makai side of the highway.

Kalanianaʻole Highway has a posted speed limit of 25 miles per hour; actual traffic flow, however, has been reported to be closer to 35 miles per hour¹². The typical cross section includes two 12-foot lanes and unpaved shoulders varying in width from two to eight feet. In the 0.3-mile portion nearest Poalima Street, the mauka side of the roadway has been improved to include curbs and sidewalks.

The new water line will continue in the mauka direction under Poalima Street and Hihimanu Street, terminating at the intersection of Hihimanu Street and Nonokio Street, which is located approximately 1.05 miles from the intersection of Kalanianaʻole Highway and Poalima Street.

The intersection of Kalanianaʻole Highway and Poalima Street is controlled by a traffic signal. All other intersections along the roadways within the project limits are unsignalized, typically with stop sign controls for the streets intersecting with Kalanianaʻole Highway, Poalima Street, or Hihimanu Street. Hihimanu Street generally runs parallel to Kalanianaʻole Highway. Approximately 0.5 mile east of its intersection with Nonokio Street beyond the end of the proposed project, Hihimanu Street bends, becomes perpendicular to the highway, and intersects with Oluolu Street, where traffic on Hihimanu Street is controlled by stop signs. Hihimanu Street continues another 0.1 mile and is stopped again at an unsignalized cross-intersection with Kalanianaʻole Highway.

In the vicinity of the project, two local streets provide an alternative route to the use of the signalized intersection of Kalanianaʻole Highway and Poalima Street. Mekia Street is a two-lane street that begins at an unsignalized T-intersection with Kalanianaʻole Highway and proceeds south (mauka) to Lukanela Street, which is parallel to the highway and connects Poalima Street to Mekia Street. Mekia Street continues into a residential area. Concerns

¹¹ Traffic study prepared by Julian Ng, PE, PTOE, September 2000.

¹² City and County of Honolulu, Department of Transportation Services. *Waimanalo Traffic Calming Charrette, Final Report*. (R.M. Towill Corporation and Walkable Communities Inc., March 2000), p. 9.

have been raised about speeding on the residential portion of Mekia Street and several traffic calming measures have been suggested, including a redesign of the intersection of Mekia Street and Lukanela Street.

Traffic Conditions

The State Highways Division collects traffic count data at various locations on an annual or biennial basis. These traffic counts are used to estimate traffic volumes on segments of highway. Table 4 shows recent estimates of daily and peak hour volumes for the segment of Kalaniana'ole Highway between Keolu Drive and the Bellows main entrance.

Table 4: Kalaniana'ole Highway Traffic Estimates

	24-hour, two way Volume (vpd)	AM Peak Hour (vph)		PM Peak Hour (vph)	
		SEBound	NWBound	SEBound	NWBound
1996	19,095	840	688	840	688
1997	18,816	828	677	828	677

Notes: vpd = vehicles per day; vph = vehicles per hour

SEBound = Southeast Bound; NWBound = Northwest Bound

Daily volumes from State Highways Division, *Traffic Summary, Island of Oahu*. (various years of the annual reports).

Peak hour volumes estimated from daily volumes and factors from the State Highways Division, as reported in the *Traffic Summary* reports.

SECTION 3

AFFECTED ENVIRONMENT

Twenty-four hour counts were taken at Waimanalo Stream Bridge, which is within the project area. Table 5 shows the weekday and peak hour data from the four most recent counts. Peak hours from the 1998 count were 7:15 to 8:15 am and 4:30 to 5:30 pm.

Table 5: Traffic Counts, Kalaniana'ole Highway at Waimanalo Stream Bridge

	24-hour Count (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
	SEBound	NWBound	SEBound	NWBound	SEBound	NWBound
June 1991	10,565	11,211	593	632	787	872
July 1993	10,292	11,366	582	672	741	805
May 1995	12,254	11,218	884	744	1,326	866
June 1998	9,910	10,983	569	620	723	835

Source: State Highways Division, *Traffic Survey Data*, Island of Oahu. Station C-42-F.

Two-way hourly volumes recorded in 1998 between 6:30 am and 7:45 pm exceeded 1,000 vehicles per hour. Between 10:00 am and 7:00 pm, hourly two-way volumes were 1,250 vehicles per hour or greater. The 1998 counts included a vehicle-type classification; trucks made up 2.6% of the 24-hour volume, 3.9% of the volume in the AM Peak Hour, and 2.1% of the volume in the PM Peak Hour. Table 6 provides additional detail from the vehicle classification counts.

Table 6: Vehicle Type Classification, Kalaniana'ole Highway at Waimanalo Bridge

	24-hour Count (vpd)		10:30-11:30 am		4:30-5:30 pm	
	2-way	%	2-way	%	2-way	%
Passenger Cars	20,357	97.4	1,298	96.1	1,526	98.0
Bus & 2-axle Trucks	371	1.8	40	3.0	15	1.0
Other Single Unit Trucks	64	0.3	6	0.4	7	0.4
Semis & Larger Trucks	101	0.5	7	0.5	10	0.7
Total Vehicles	20,893	100	1,351	100	1,558	100

Source: State Highways Division, *Traffic Survey Data*, Island of Oahu, 1998. Station C-42-F.

SECTION 3

AFFECTED ENVIRONMENT

Traffic count data for other streets in the area that are affected by the proposed project are not available. However, estimates of volumes on Poalima Street and on Hihimanu Street were made using counts taken by the State Highways Division along Kalaniana'ole Highway and on Oluolu Street; these estimates are shown in Table 7.

Table 7: Traffic Estimates, Poalima Street and Hihimanu Street

	24-hour Volume (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
	SBound	NBound	SBound	NBound	SBound	NBound
Poalima Street	1,300	1,300	100	175	135	115
Hihimanu Street	900	900	40	75	75	60

Total traffic volumes on Mekia Street are estimated to be about half of those shown for Hihimanu Street; Lukenela Street traffic is estimated to be less than on Mekia Street.

The intersection of Kalaniana'ole Highway and Poalima Street is controlled by a traffic signal that operates in two phases, assigning the use of the intersection alternatively to highway traffic and to traffic approaching on Poalima Street. Vehicles exiting from a shopping center driveway opposite Poalima Street also use the intersection during the Poalima Street phase. Left turns from the highway are made when there are gaps in the oncoming highway traffic. For a signalized intersection, non-conflicting movements such as opposing through traffic could be accommodated at the same time. Conflicting movements cause delays and increase demands on the intersection; the critical volumes, or volumes which impose a demand on the intersection, are often used to determine the adequacy of a signalized intersection. At this intersection, a vehicle spacing of one vehicle per lane every 2.5 seconds, or a capacity of 1,440 vehicles per lane per hour was used to estimate capacity. For the estimated peak hourly volumes at the intersection of Kalaniana'ole Highway, the critical per lane volumes are as shown in Table 8.

The critical volume sums for times other than peak hours would be less than the PM Peak Hour, since highway volumes, which account for over 75% of the critical volumes, are less than those of PM Peak Hour.

The *Highway Capacity Manual*¹³ defines criteria for status at signalized intersections: under capacity ($X_{cm} \leq 0.85$), near capacity ($0.85 < X_{cm} \leq 0.95$), at capacity ($0.95 < X_{cm} \leq$

¹³ *Highway Capacity Manual, Third Edition, Updated 1997 (published 1998), Table 9-15.*

1.0), and over capacity ($X_{cm} > 1.00$). For the parameters described above, the intersection of Kalaniana'ole Highway and Poalima Street operates at desirable under-capacity conditions during each peak hour and during other hours of the day.

Table 8: Existing Conditions, Kalaniana'ole Highway and Poalima Street

Peak Hour:	AM	PM
Highway traffic, southeast bound	570	725
10% of northwest bound traffic making left turns	60	85
Poalima Street and shopping center traffic	250	240
Total critical volumes	880	1,050
volume/capacity ratio, X_{cm} , for capacity = 1,440	0.61	0.73

The *Highway Capacity Manual*¹⁴ describes a "Level of Service" rating of traffic conditions. Levels of service are based on densities in roadway segments and average delays at intersections. Conditions on the local two-lane streets, where flows are generally uninterrupted and speed limits of 25 miles per hour are posted, are best described by vehicular densities. For a volume of 300 vehicles per hour, the average density would be 12 vehicles per mile, which would be within the range for Level of Service A. Estimated peak hour volumes on all streets within the project area are well below 300 vehicles per hour.

At the unsignalized intersections, delays to traffic approaching the intersection from side streets controlled by a stop sign determine the levels of service. Stopped traffic must wait for a gap in the other traffic in order to cross or enter the intersection. Analyses of unsignalized intersections indicate that the maximum average delays would be between 10 and 20 seconds, or Level of Service C. (Roadway conditions are considered acceptable to Level of Service D, for which average delays are up to 30 seconds.)

3.5 UTILITIES

Existing utility systems along the project include electric power facilities, CATV underground cables, telephone facilities, gas pipelines, and sewer lines. In addition, a U.S. Army signal cable line is located within the project corridor. Prior to the start of excavation, all agencies and utility companies will be contacted to verify locations.

¹⁴ *Highway Capacity Manual, Third Edition*, Updated October 1994, Table 10-3.

4 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 PHYSICAL ENVIRONMENT

4.1.1 Geology

There will be no significant impact to the geology of the project area. The installation of a transmission main that is 36 inches in diameter will typically involve excavation to depths of 8-12 feet; a smaller diameter pipe would require less excavation. Valve vaults are underground structures measuring approximately 11 feet by 10 feet with the bottom of the vault located approximately 9 feet below the existing ground surface. When installation is completed, ground surface will be returned to pre-construction condition.

4.1.2 Soils

Significant adverse impact on soils in the project area is not anticipated. Construction within paved areas will involve appropriate fill material and restoration to preexisting conditions. Construction on roadway shoulders without pavement may temporarily expose soil to erosion. However, soil types found in the project area, and described in Section 3.1.2 above, generally pose a slight erosion hazard. Any impact of construction activities on soils will be mitigated by several measures, as outlined in the following regulations:

- Chapter 14, Articles 13-16, Revised Ordinances of Honolulu, as amended, related to grading, grubbing, sediment control, and stockpiling;
- Department of Planning and Permitting, Rules relating to Soil Erosion Standards and Guidelines, (1999);
- USDA Soil Conservation Services Erosion and Sediment Control Guide for Hawaii, (1968).

Soil erosion control measures may include, but are not limited to, use of cut-off ditches, temporary ground cover, and detention ponds.

Because soil conditions can vary significantly with depth, seven borings were taken at key locations along the alignment for the water main. The borings ranged in depth from 16.5 to 76.5 feet below the existing ground surface. Findings from subsequent laboratory analyses have been used to assist the engineering and design of the proposed water line. Given the foundation loads anticipated and the presence of soft and/or loose soils in the project area, deep foundations consisting of drilled shafts or piles extending a minimum of 50 feet below the bottom of footings have been recommended to support the proposed 36-inch water main

at the stream crossings.¹⁵ At the location of the proposed valve vaults, a stabilization layer consisting of 24 inches of clean granular fill material is recommended.

4.1.3 Climate and Air Quality

Climatic conditions are not expected to have a significant impact on the project. To the extent possible, construction work, particularly in and around the streams will be scheduled to avoid the protracted rains and storms that are more likely to occur during the rainy season.

Temporary and localized negative impacts on air quality will occur in areas adjacent to the construction site. Equipment used during the construction phase will emit exhaust and airborne particulates, and construction work will produce dust. Due to the close proximity of existing residences and commercial establishments along the project corridor, appropriate mitigation measures will be employed to reduce the potential for fugitive dust during construction activities. These mitigation measures include the following:

- Construction will be phased to minimize the amount of excavation and exposed time of excavated/trench areas.
- Clearing and excavation/trenching will be held to the minimum necessary for site access and equipment.
- Stockpiles will be covered with appropriate materials. Construction debris and excavated materials that will not be used for construction will be disposed of at permitted facilities.
- Water trucks will visit the sites routinely to sprinkle water on the ground to control dust. If necessary, the contractor will provide additional watering of sites.
- Exposed trench areas will be covered with steel plates during weekends and after hours.
- The contractor will use vehicles that are properly maintained.

Construction activities will employ fugitive dust emission control measures in compliance with provisions of the State DOH Rules and Regulations (Chapter 43, Section 10), and Hawaii Administrative Rules (HAR), Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33 on Fugitive Dust.

¹⁵ Summary of Findings and Recommendations in "Geotechnical Engineering Exploration, 36-inch Water Main, Waimanalo to Olomana, Phases 1 and 2" Prepared by Geolabs, Inc., December 5, 2000.

4.1.4 Natural Hazards

Flooding is not anticipated to affect the proposed project. During construction, the potential for impacts due to storm runoff will be addressed by use of erosion control measures in accordance with City and County of Honolulu, Rules relating to Soil Erosion Standards and Guidelines, 1999, and Erosion and Sediment Control Guide for Hawaii, Soil conservation Service, 1968. Following construction, the water main will have a minimum cover of 3 feet. Fill over the water main will be properly compacted and restored to preexisting conditions.

Although seismic risk is minimal for Oahu, the water main will be installed in accordance with higher UBC Seismic Zone 3 standards.

4.1.5 Hydrology and Water Quality

Surface Water

Burial of the water main beneath the Waimanalo and Kahawai Streams will require additional measures to minimize impacts on stream flow and stream biota. Each of the streams would be temporarily diverted to one side of the streambed through the use of sheet piles and/or steel plate coffer dams. After the first half of the segment is completed, the stream will be diverted to the other side to complete the installation. In the case of Waimanalo Stream, there is already a concrete wall that divides the stream on the mauka side of the bridge. Stream flow will not be blocked completely at any time during construction. Temporary diversions at Waimanalo Stream and Kahawai Stream are estimated to last approximately 2-4 weeks for each stream channel. Construction work would be scheduled during the dry period of the year to the extent possible.

Water pumps will be used to discharge water from the construction area into settling tanks. The dewatering discharge will go through a dewatering treatment and filtration system that will remove silt, dirt, oil, grease, and suspended solids to acceptable levels.

Best Management Practices (BMPs) and a water quality monitoring plan will be developed for the stream crossing work. A water quality monitoring plan will be established to verify the adequacy of the dewatering filtration system and to ensure that the proposed construction activities will not result in long-term adverse impacts to State waters. Water sampling will be performed before construction commences to define the water quality baseline, during construction activities, and after construction is completed. The water quality parameters to be measured include total suspended solids, dissolved oxygen, temperature, pH, turbidity, salinity, and oil and grease. This effort will be coordinated with the Total Maximum Daily Load (TMDL) program.

BMPs that will be incorporated into the project to minimize impacts to aquatic and riparian resources include the following:

- *All project-related materials should be placed or stored in ways to avoid or minimize disturbance to the aquatic environment;*
- *All project-related material should be free of pollutants*
- *No contamination of the aquatic environment (trash, debris, disposal, etc.) should result from project activities;*
- *A contingency plan to control accidental spills of petroleum products should be developed. Absorbent and containment booms should be stored on-site to facilitate the clean-up of petroleum spills;*
- *Turbidity and siltation from excavation activities should be minimized and contained to the immediate vicinity of excavation through the use of silt containment devices and the curtailment of excavation during adverse weather conditions; and*
- *Removal of riparian vegetation should be avoided or minimized.*

Groundwater

Groundwater was encountered at depths ranging from about 0.5 to 10 feet below the existing ground surface in the borings drilled during field explorations. Based on the relatively shallow groundwater anticipated, and the nature of the soils to be encountered during the excavations, dewatering will be required for this project and a National Pollutant Discharge Elimination System (NPDES) permit will be necessary. Pumping of groundwater from dewatering areas into the existing storm drain system would occur over short periods of time and is not expected to significantly affect the chemical profile of receiving waters.

The dewatering system is needed to provide safe and dry working conditions in excavated areas. At the same time, there is the potential of depressing the natural groundwater table. To reduce the amount of dewatering within the excavations and to reduce the potential for ground subsidence, cut-off walls, such as inter-locking sheet piles, will be used, as necessary. Additionally, sumps will be used to collect water that percolates up into the base of the excavation or infiltrates through the sheet piles. If driven to sufficient depth, the sheet pile shoring support system, combined with tremie concrete plugs is relatively water tight, which should allow the groundwater levels outside the excavations to be maintained at close to the original pre-construction levels. As a further safeguard, the contractor will put in place precautionary or remedial measures including, but not limited to, stopping or slowing down the dewatering operations.

Hydrotesting Discharge

The water main will be disinfected with a chlorine solution after being hydrostatically tested and checked for leaks. The chlorinated water will be retained in the pipeline long enough to allow disinfection. Disposal of the effluent will be in accordance with applicable Federal, State, and City requirements. All hydrotesting, preflushing, and chlorination will be undertaken using potable source water. Prior to construction, the contractor will submit a plan indicating the locations and amounts of chlorinated water to be discharged for review and approval by the appropriate authorities. Hydrotesting and disinfection of the water main will be coordinated following installation of each phase as determined appropriate by the

contractor. The State Department of Health, NPDES Permit, Notice of Intent (NOI) for Discharges and Hydrotesting Waters, and City and County of Honolulu permit to discharge effluent into the municipal storm sewer system, are required for this project. Best management practices will be followed in monitoring, treating, and disposing of hydrotesting effluents.

4.1.6 Noise Impacts

Project Construction Noise

Project construction will involve excavation, grading, pile-driving, paving, and movement of construction vehicles. The various construction activities may generate significant noise that impacts nearby residential areas. The actual noise levels produced will be a function of the methods employed during each stage of the construction process. Pile drivers and earthmoving equipment, e.g., backhoes, front loaders, bulldozers, and diesel-powered trucks, will probably be the loudest equipment used during construction. The Department of Health's (DOH) maximum permissible noise levels for construction equipment during nighttime hours in residential areas is 45 dBA and 55 dBA during daytime hours or the ambient noise level—whichever is higher. Ambient noise levels in the project area are slightly higher than the DOH standard. Based on the ambient noise readings, noise levels during the nighttime hours must be below 51 dBA in the residential area along Kalaniana'ole Highway and below 46 dBA in the residential area along Poalima Street and Hihimanu Street.

Along Kalaniana'ole Highway, earthmoving equipment within 4,000 feet of residential areas and in a direct line of sight will produce noise levels that exceed the maximum permissible nighttime sound levels. Along Poalima and Hihimanu Streets, earthmoving equipment within 8,000 feet of residential areas and in a direct line of sight will produce noise levels in excess of the maximum permissible nighttime sound levels. Daytime noise levels along these streets will also exceed DOH noise regulations if they are conducted within 1,600 feet of residences along Kalaniana'ole Highway and within 4,000 feet of residences along Poalima and Hihimanu Streets.

In cases where construction noise exceeds, or is expected to exceed the DOH's "maximum permissible" property line noise levels, a permit must be obtained from the DOH to operate vehicles, construction equipment, power tools, etc. that emit noise levels in excess of "maximum permissible" levels. To reduce the noise impact of construction activities, all work should be conducted during the daytime hours.

Project Generated Traffic Noise

During some portions of the project, vehicles may be detoured from Kalanianaʻole Highway onto Mekia Street, Lukanela Street, and Poalima Street. Detoured vehicles will increase the traffic volume and, therefore, traffic noise on these streets. It is expected that the detours will only be in place during construction hours, e.g., 7 am to 6 pm. The duration of these detours, the times of the detours, and the number of detoured vehicles have not been determined. Noise levels along the detour streets may exceed FHWA and State DOT highway noise goals (67 dBA) during peak traffic periods. However, the elevated noise levels will be short term and occur only during detour periods. Following the completion of the project, noise levels are expected to return to existing levels.

Residents will be informed of plans and the timing of the water system upgrades prior to construction. Residents and other roadway users will also be informed of any lane closures and detours when construction is imminent. To minimize traffic impacts and cost, Phase 1 of the project, along Kalanianaʻole Highway from Olomana Golf Links to Poalima Street, will be combined with the State DOT's highway widening project.

4.2 BIOLOGICAL ENVIRONMENT**4.2.1 Flora**

The proposed water line corridor passes through urbanized areas and agricultural lands. Vegetation along the corridor is dominated by introduced or alien plants, such as koa haole, Guinea grass, Bermuda grass, and scarlet-fruited gourd. Introduced species are plants that were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact in 1778. None of the plants occurring naturally on the project site is a threatened or endangered species (U.S. Fish and Wildlife Service 1999).

The native plants found alongside Kahawai Stream were planted at this site as part of a project by the Waimanalo Community Health Center and is not a naturally occurring population. *The BWS will inform the Waimanalo Health Center and the Waimanalo Watershed Project of the contractor's schedule so that salvageable plants can be temporarily removed. The irrigation line will also require temporary repiping. A revegetation plan will be developed to ensure that impacts to the restoration project are minimized and the banks are restored close to their original condition.*

4.2.2 Fauna

The proposed project is not expected to have long-term adverse impacts on wildlife. The proposed project will affect existing transportation corridors and residential and commercial properties that are already highly disturbed. Pipeline installation will not permanently affect the stream channel; therefore, there it is not expected to have a long-term effect on water

birds. Construction activities may temporarily disturb foraging opportunities immediately adjacent to Kalanianaʻole Highway, causing water birds to go elsewhere during construction. However, wildlife should return to the site upon completion of the project.

Further consultation regarding habitat for threatened and endangered water birds, including the 'alae 'ula and koloa, will occur during the Army Corps of Engineers' permit application review process for dredge and fill activities as regulated under Section 404 of the Clean Water Act. Potential mitigation measures, such as phasing the project to avoid prime nesting season and monitoring for nesting activities prior to construction, will be examined further during the Section 7 consultation.

4.2.3 Stream Fauna

The project is being planned and designed to avoid or minimize impacts to stream fauna and the stream environment to the extent practicable. The two stream crossing will be phased so that at any given time, no more than half the stream will be blocked, allowing the free movement of existing aquatic species. During in-stream work, the construction area will be protected by sheet piles and/or steel plate coffer dams to isolate the aquatic ecosystem from the construction area. Because the construction area will have to be dewatered to provide a safe, workable environment, a filtration system will be put in place to remove pollutants from these waters before being discharged into the streams (see Section 4.1.5 Surface Water Quality). Finally, to minimize disturbance to stream biota, construction in or near the stream channels will be scheduled for completion in the shortest possible time. The stream crossing permits will specify the construction method, pollution control measures, and project scheduling. Additional mitigation measures are discussed in Section 4.1.5, related to surface water quality.

4.3 SOCIO-ECONOMIC ENVIRONMENT

4.3.1 Population and Employment

The proposed project, in itself, will not affect population levels. The region's population, along with water demand, is anticipated to grow even without the project. The proposed water main is intended to provide expanded capacity for future needs along with improved reliability for long-term service of potable water.

As standard procedure, the construction contract will be bid by BWS to a contractor who will be responsible for all aspects of the project, including supplying a construction crew. The contractor and construction crew will most likely come from all areas of Oahu, including some workers who may reside in Koolaupoko district.

4.3.2 Surrounding Land Uses

Motorists who customarily travel on Kalanianaʻole Highway, and the residents, employees, and customers of properties fronting the highway will face inconveniences during Phase 1 of the project. Disruptions will be temporary and will last only as long as it takes to install each section of the transmission main. A traffic control plan will be prepared to mitigate project impacts to surrounding land uses and owners. Phase 2 of the project, along Hihimanu Street, will also involve construction-related inconveniences; however, they are expected to be less significant given the availability of alternate routes and access ways to most points along this portion of the alignment.

4.3.3 Visual and Scenic Resources

The underground transmission main will have no adverse impacts on existing views, view planes, or aesthetic resources along its length. Short-term visual impact of the excavated roadside corridor is anticipated during the construction period. However, this project will not add significant permanent structures, such as pumping stations. Therefore, long-term impacts to scenic and visual resources are not expected.

4.3.4 Archaeological, Historic, and Cultural Resources

Although Waimanalo has seven registered historic and archaeological sites, none of the identified sites are located along or within close proximity to the proposed water main installation route. The State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources was asked to review preliminary environmental and project design information. Based on this review, SHPD concluded that the combination of soil types in the project area and former road development made it unlikely that significant historic sites are present (see Appendix D). One exception is the possibility of historic sites related to taro cultivation that may be present in undeveloped areas of the streams. *SHPD has expressed concern about the stream crossings and will be given an opportunity to review construction plans.* Should any unidentified cultural remains be uncovered at any time during excavation operations in the roadways or stream channels, work in the immediate area will cease and the ~~appropriate government agencies~~ *SHPD, Oahu Island Burial Council, and Office of Hawaiian Affairs* will be contacted for further instructions, *including possible procurement of a qualified cultural monitor.*

Act 50 requires that a proposed action's impact(s) on the cultural practices of a community be disclosed in the environmental review process. In this case, the project area is confined to existing public roadways that are periodically subjected to construction and repair activities. The proposed action itself will not impede or obstruct public access or use of the corridor in which the pipeline will be installed.

4.3.5 Recreational Resources

The proposed project will require temporary traffic diversions to and from the Waimanalo District Park during part of Phase 2 construction. No impacts on the other recreational resources in Waimanalo are anticipated.

4.3.6 Public Health and Safety

Necessary measures to assure public health and safety will be provided throughout all phases of construction. The contractor will provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, and other safety facilities. These safety precautions will conform with the "Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways," as adopted by the Highway Safety Coordinator and the U.S. Federal Highway Administration. *The contractor will also contact District 4 police personnel to coordinate adequate police coverage and response.*

During construction, the contractor will maintain fire apparatus access throughout the construction site and notify the Fire Communication Center of any interruption in the existing fire hydrant system. Upon completion of this project, the immediate area will benefit from new fire hydrants that will supplement the existing hydrants, thus increasing firefighting resources along Kalaniana'ole Highway and Hihimanu Street.

4.4 LAND USE PLANS, POLICIES, AND CONTROLS

4.4.1 Hawaii State Plan

The Hawaii State Plan, Chapter 226, HRS, serves as a written guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities and by providing a basis for determining priorities and allocating limited resources, such as public funds, services, manpower, land, energy, water, and other resources. Relevant State Plan goals, objectives, policies and priority guidelines are noted below.

The proposed project would be in conformance with State Plan objectives and policies for facility systems – in general,

"(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives."

"(b) To achieve the general facility systems objective, it shall be the policy of this State to: (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and

county plans...: and "(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user." (Section 22-14, HRS).

The project also conforms to Section 22-6-16, Water, HRS,

"(a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities" (Section 22-6-16, HRS).

4.4.2 State Land Use Classification

The State Land Use Commission, pursuant to Chapter 205 and 205A, HRS and Chapter 15-15, Hawaii Administrative Rules, is empowered to classify all lands in the State into one of four land use districts: urban, rural, agricultural and conservation. The corridor in which the transmission will be installed falls within the "Urban" classification. Activities or uses that fall within the Urban classification are regulated by the County.

4.4.3 City and County of Honolulu Land Use Regulations

Koolaupoko Sustainable Communities Plan

Development Plans, a mandate of the City Charter, have been adopted by ordinance for eight geographic regions of the island since 1985. Development Plans provide general guidelines and policies for development by identifying permissible land uses on the Development Plan Land Use Map, and various public facilities and improvements on the Development Plan Public Facilities Map.

The proposed project falls within the Koolaupoko planning area. A revised plan, called the Koolaupoko Sustainable Communities Plan, was adopted by the City Council in August 2000. The overarching goal of the plan is to protect community resources and the residential character of the district and to adopt public improvement programs and development regulations that reflect a stable population. The emphasis on sustainability is balanced by a recognition that the community will continue to evolve and public policies must respond and adapt to changing community needs. With respect to the proposed action, the following excerpt from the Koolaupoko Sustainable Communities Plan is particularly applicable:

Although Koolaupoko is nearly built-out, it will be essential to improve and replace, as necessary, the district's aging infrastructure systems to increase capacity, improve operational performance or extend the useful life of facilities. Infrastructure

modifications may also be made to enhance the quality of the urban, rural, neighborhood, or natural environment.¹⁶

According to the Land Use Map, land uses in the project corridor include Agriculture, Residential, Commercial, Public Facility, and Park. The proposed water main is a permitted use in all of these land use categories (See Figure 7).

Development Plan Public Facilities Map

The Development Plan Public Facilities Map is a planning tool that identifies all major publicly funded facilities and the general time frame for construction, whether short-term (within 6 years) or long-term (beyond 6 years). It is amended regularly to show a composite picture of upcoming capital improvement projects. The current map shows the BWS's near-term intent to construct a water main along Kalaniana'ole Highway in Waimanalo.

County Zoning

As shown in Figure 8, zoning districts along the proposed project corridor include:

- AG-1 Restricted Agriculture
- AG-2 General Agriculture
- Country
- R-5 Residential, and
- B-1 Neighborhood Business

Water transmission mains are classified as Utility Installation, Type A, defined as those utility installations with minor impact on adjacent land uses. Utility installations, Type A, are a permitted use without conditions for each of the zoning districts listed above and is, therefore, consistent with the land use ordinance.

4.4.4 Special Management Area

As shown in Figure 9, the Kalaniana'ole Highway portion of the project (Phase 1) falls along the boundaries of the Special Management Area (SMA). Coastal zone management objectives and policies (Section 205A-2, HRS) and the SMA guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, restore the natural resources of the coastal zone of Hawaii.

If the project alignment is within a public right-of-way, it is exempt under Sec. 25-1.3, because the action does not fall under the definition of "Development." Under this definition, "installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors" do not require a SMA permit. (Sec. 25-1.3, (2)(M)). However, if the alignment extends outside the right-of-way (possibly at the stream crossings), an SMA permit would be required.

¹⁶ *Koolau-poko Sustainable Communities Plan*, Ordinance No. 00-47, effective August 25, 2000, page 2-2.

modifications may also be made to enhance the quality of the urban, rural, neighborhood, or natural environment.¹⁶

According to the Land Use Map, land uses in the project corridor include Agriculture, Residential, Commercial, Public Facility, and Park. The proposed water main is a permitted use in all of these land use categories (See Figure 7).

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County Zoning

As shown in Figure 8, zoning districts along the proposed project corridor include:

- AG-1 Restricted Agriculture
- AG-2 General Agriculture
- Country
- R-5 Residential, and
- B-1 Neighborhood Business

Water transmission mains are classified as Utility Installation, Type A, defined as those utility installations with minor impact on adjacent land uses. Utility installations, Type A, are a permitted use without conditions for each of the zoning districts listed above and is, therefore, consistent with the land use ordinance.

4.4.4 Special Management Area

As shown in Figure 9, the Kalaniana'ole Highway portion of the project (Phase 1) falls along the boundaries of the Special Management Area (SMA). Coastal zone management objectives and policies (Section 205A-2, HRS) and the SMA guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, restore the natural resources of the coastal zone of Hawaii.

If the project alignment is within a public right-of-way, it is exempt under Sec. 25-1.3, because the action does not fall under the definition of "Development." Under this definition, "installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors" do not require a SMA permit. (Sec. 25-1.3, (2)(M)). However, if the alignment extends outside the right-of-way (possibly at the stream crossings), an SMA permit would be required.

¹⁶ *Koolaupoko Sustainable Communities Plan*, Ordinance No. 00-47, effective August 25, 2000, page 2-2.

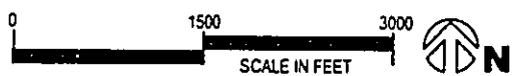
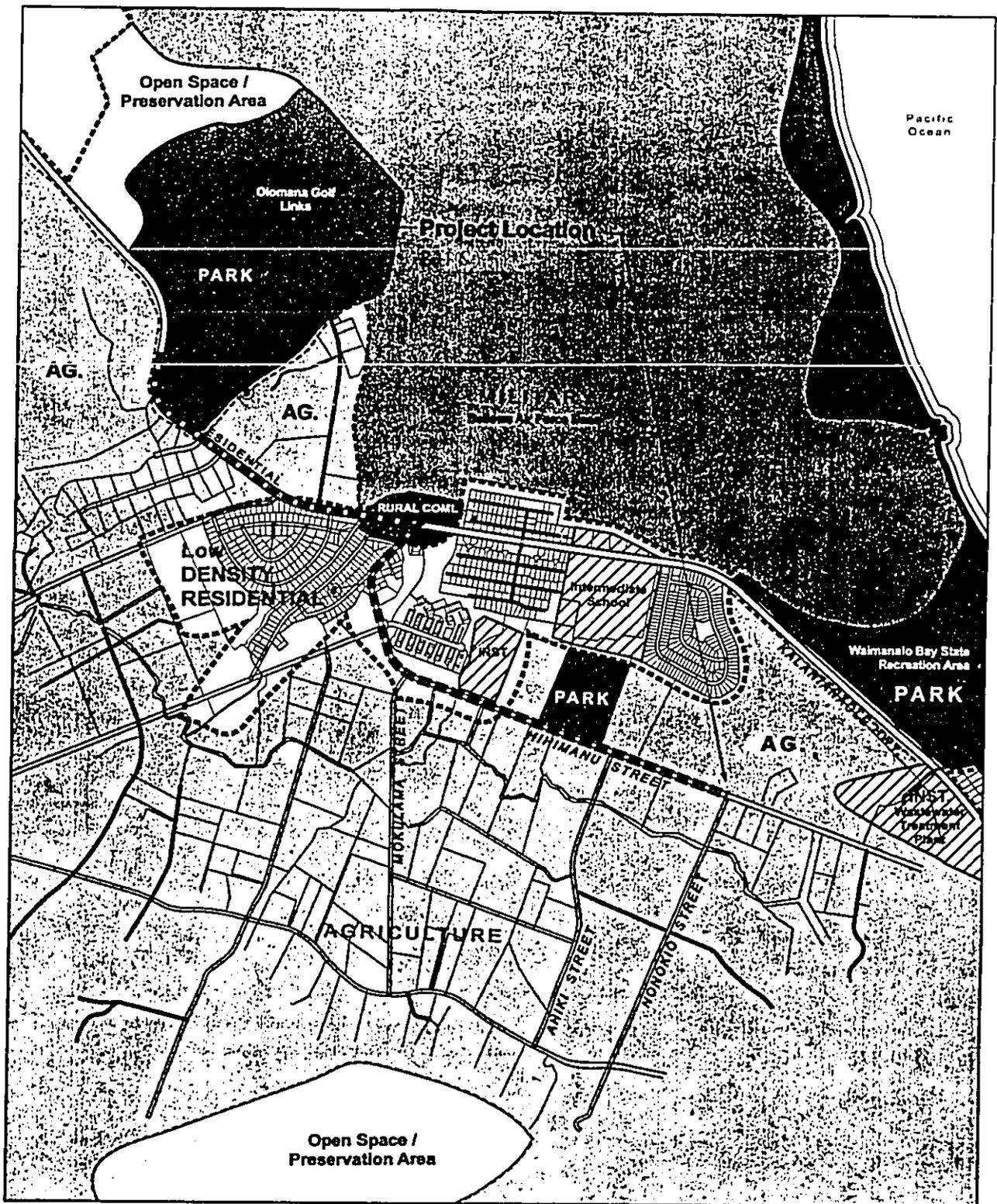


Figure 7
Koolaupoko Sustainable Communities Plan Map

Board of Water Supply
Kalaniana'ole Highway 36-inch Main
Waimanalo to Olomana

June 2002

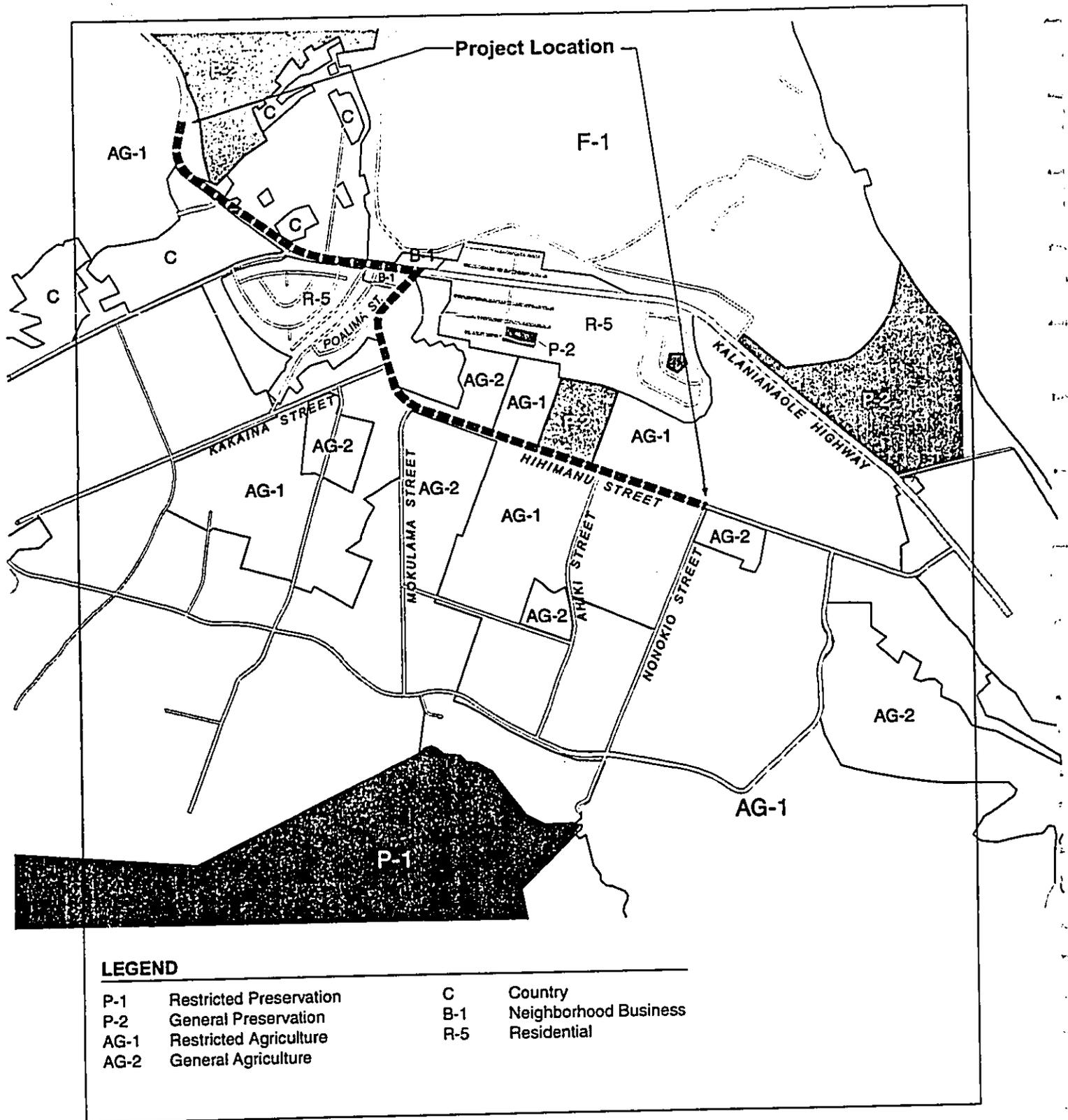


Figure 8
County Zoning Map

Board of Water Supply
Kalaniana'ole Highway 36-inch Main
Waimanalo to Olomana

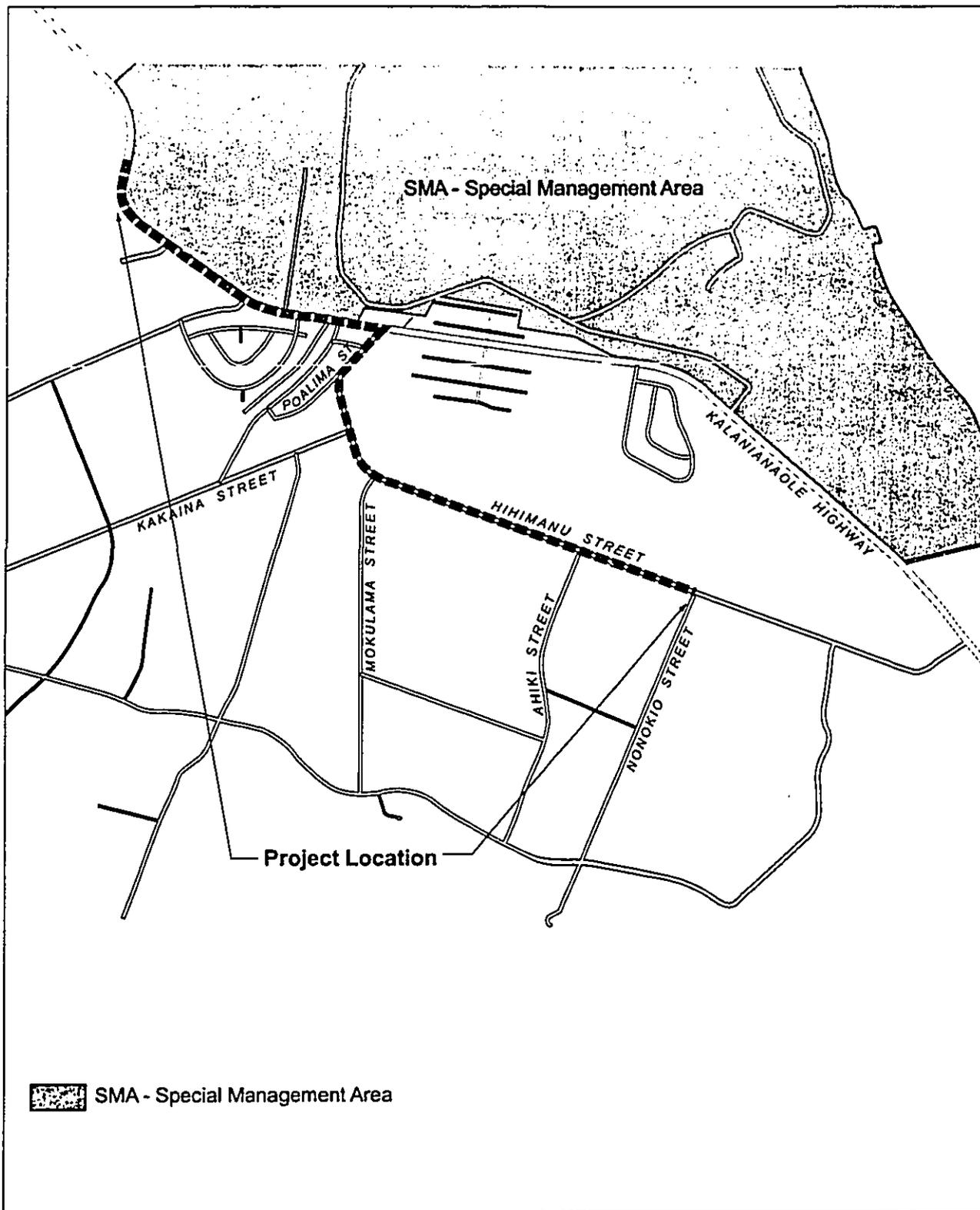


Figure 9
SMA Boundary

Board of Water Supply
 Kalaniana'ole Highway 36-inch Main
 Waimanalo to Olomana

June 2002

4.5 TRAFFIC AND CIRCULATION IMPACTS

The proposed project will not affect traffic volumes upon completion. However, since the water line is located within portions of Kalaniana'ole Highway, Poalima Street, and Hihimanu Street, the ability of the streets to carry traffic will be affected during construction. Trenching and other excavation will affect pavement areas normally used by traffic. The effects could include actual excavation and backfill, construction operations on or near the roadway, or other related activities. As water line construction proceeds along the shoulder of the roadway, traffic movements on cross streets and across driveways may be affected. Access to adjoining properties will be maintained. Construction will be staged so that only a limited length of roadway will be affected at any one time. Any excavation within the roadway areas would be covered with non-skid plates during non-working hours.

Impacts of Construction Activities

Construction of the water line is anticipated to be done under two separate construction contracts, basically one along Kalaniana'ole Highway and the other along Poalima Street and Hihimanu Street. *A traffic control plan will be submitted to the State Department of Transportation and City Department of Transportation Services for review and approval. Anticipated traffic impacts and proposed mitigating actions include the following: If construction occurs simultaneously, coordination between the two projects would be necessary to minimize conflicts.*

Near Olomana Golf Links, portions of the northbound lane of Kalaniana'ole Highway will be closed while the new pipeline is being laid and the connection to the existing water line is made. Northbound traffic will be detoured through the site by using the existing roadway shoulder or by detouring the southbound traffic onto the mauka shoulder and using a portion of the southbound lane. The entrance to the golf course may be reduced to a single lane for short periods of time, during which a flagman will direct traffic. The existing separate left turn lane for southbound traffic entering the golf course may also be used to implement detours on the highway.

Between Olomana Golf Links and Mekia Street, the new water line will be located under the makai shoulder of the highway. Construction will affect portions of the northbound lane. Both lanes of the highway will be narrowed and shifted mauka, using the mauka shoulder where possible. Access across the makai shoulder will be temporarily closed as trenching and pipeline construction proceeds across driveways. Pedestrian and bicycle use of the makai shoulder will be restricted during construction.

Two lanes of traffic on Kalaniana'ole Highway will be maintained at all times north of Mekia Street, except for very short periods when construction equipment is moved across the highway. If one lane needs to be closed, the single lane that remains would need to be used alternately by southbound and northbound traffic. Flagmen would direct traffic, permitting traffic in one direction to flow while the other direction is stopped. Traffic counts indicate

that any lane closure on the highway would create long delays during the morning peak period (7:00-9:00 am) and during most of the day (11:00-6:30 pm).

Lukanela Street and a portion of Mekia Street (between Lukanela Street and Kalaniana'ole Highway) will be used to detour traffic around construction activities near the intersection of Kalaniana'ole Highway and Poalima Street. During times when the northbound flow is detoured, a flagman will be used to assist in the movement of traffic from Mekia Street onto the highway.

Construction of a lateral and manhole on Mekia Street will be expedited if Mekia Street is closed to all traffic between Lukanela Street and Kalaniana'ole Highway; if this were done, traffic that would otherwise use Mekia Street could be rerouted onto Lukanela Street and Poalima Street. This work will be coordinated with the work near the intersection of Kalaniana'ole Highway and Poalima Street so that construction activities at both locations do not occur simultaneously.

The water line will be located under the pavement or under the makai shoulder of Poalima Street and a portion of Hihimanu Street to the end of the project at Nonokio Street. During construction, traffic may be limited to one lane; flagmen will be used to alternate the use of the single lane by southbound and northbound traffic. Delays of up to five minutes could occur when traffic is stopped to allow flow in the other direction or to clear the construction area of traffic.

Construction-related inconvenience and delays to traffic can be expected. While some drivers may seek to avoid the areas affected by construction by driving through neighborhoods, no detours will be designated on residential streets. The dissemination of public information on the locations of construction activities, any lane closures or detours, and other related news will warn drivers and other users of the potential for delays and any alternatives that may be available.

Construction and restoration of the existing roadway will be performed in accordance with all applicable sections of the "Standard Specifications for Road and Bridge Construction" (1994). All work will also conform with the "Administrative Rules of Hawaii Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" and the Manual of Uniform Traffic Control Devices for Street Maintenance Operation." Plans for construction and traffic control will be submitted for review and approval by the City and County of Honolulu, Department of Planning and Permitting and the State Department of Transportation, Highways Division.

4.6 UTILITIES

All existing utilities in the project area will remain in service and in place. The water main alignment and grade may be changed if there are conflicts with or insufficient spacing

between existing underground utilities. Should relocation of existing lines, cables, or pipes be necessary, the contractor will obtain approval from the relevant agencies and utilities.

Aboveground electric poles and suspended powerlines are located on the mauka side of both Kalaniana'ole Highway and Hihimanu Street. The proposed alignment is generally on the makai side of Kalaniana'ole Highway and Hihimanu Street, thus minimizing conflict with the power grid. In all cases, the proposed alignment is designed with a minimum ~~5-foot~~ 10-foot clearance from any existing electric poles *and/or its anchor system*.

During installation of the proposed water main, live taps will be used to tie into the existing water system so as not to disrupt service. Water service may be shut down temporarily in areas where existing water meters need to be relocated or new service laterals installed.

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5 POSSIBLE ALTERNATIVES

5.1 NO ACTION

The "no action" alternative assumes the status quo, i.e., continued reliance on the existing transmission main in the project area. The aged segment of the distribution system consists of a 20-inch main and smaller distribution pipelines. Any break in the existing main may cause major disruption of service in the area. Such breakages are unpredictable.

5.2 DELAYED ACTION

To delay the project will mean continued reliance on the existing transmission system until the action is initiated. Delaying the project would not significantly alter the environmental consequences of the project. In the interim, water users could experience service disruptions and associated inconveniences if a break occurs. In addition, project costs are likely to increase because of inflation and changes in economic and labor supply conditions.

5.3 ALTERNATIVE ALIGNMENTS

No consideration was given to installing the pipeline outside of the Kalaniana'ole Highway-Hihimanu Street corridor because the primary objective of the project is to join the two 36-inch transmission mains that already exist at either end. Poalima Street was selected as the connecting segment because it provides the most direct link. Mekia Street, which runs parallel to Poalima, is unsuitable because of conflicts with existing underground utilities, including the 20-inch water main. Alternative routes would likely require passage through private property or a longer, more circuitous route. The alignment of this project is as designated on the County Development Plan Public Facilities Map.

5.4 ALTERNATIVE STREAM CROSSING METHODS

Two stream crossings are required along the proposed corridor. Four design alternatives were considered: (1) hanging/strapping the proposed pipeline to existing bridges, (2) constructing new bridge structures to support the pipeline, (3) installing the pipeline beneath the stream channels by using the open-cut installation method, and (4) installing the pipeline under the stream channels using a trenchless technology.

The open-cut method can install water lines with great accuracy without the use of any specialized machinery. As a result, the cost of installation can be kept to a minimum. However, this alternative will require shoring and dewatering procedures. The stream channel will be disturbed and restoration of the concrete-lined channel will be required.

By hanging the new water line on the existing bridges, there will be no alteration of the stream channel. The construction time would be relatively short and no additional and/or special permits would be required. However, the segments of water line that are attached to the existing bridges will be exposed to the environment, thereby increasing the potential for corrosion and vandalism. This alternative will also require complicated traffic control to accommodate both construction and traffic on the bridges. The most serious consideration is the lack of structural integrity; the existing bridges are unable to support current highway live loads and an operational 36-inch pipeline. Hanging may be viable if a significantly smaller pipeline is installed, in which case this alternative will be reconsidered.

If separate pipe bridges were constructed, there would be no need to alter the stream channel or to place additional loads on the existing bridges. The bridge structures would need to be sufficiently massive to handle the weight of the pipeline and could alter the visual character of the area. In addition, the structure must be equipped with safety features, such as chain link fencing to discourage trespassing and tampering. Like the previous alternative, the pipeline would be exposed to the environment, which increases the potential for corrosion. This alternative also carries higher costs associated with property negotiations and acquisition.

Trenchless technologies, such as horizontal directional drilling (HDD) and microtunneling (MT), address the concerns above by allowing the pipeline to be installed in a more protected underground environment, yet eliminating impacts on the stream environment during construction. However, these advantages are offset by other considerations. Because trenchless techniques involve remote guidance of the drill head as it bores below-ground, it is essential to survey and locate all subsurface elements, including soil and groundwater conditions, existing pipelines and cables, and other obstructions that could result in unforeseen problems.

~~While the technology is improving, HDD systems may not have the accuracy necessary to drill a path to the close tolerances demanded by hydraulic criteria for the pipelines. HDD methods for the construction of pipelines involve using sophisticated drilling techniques to drill a pilot hole. The drill bit is tracked in order to steer the hole to the desired line and grade. Various reaming tools are then used to enlarge the pilot hole to the desired size. Drilling mud is used to flush the cuttings from the hole and to stabilize the hole so it does not cave in. When the hole has reached the required size, the pipeline (or a casing) is pulled back into the hole in a single operation. HDD requires an entry and exit location. The pilot-hole entry point and large drill rig require a minimum area of 60 feet by 150 feet. The exit area requires enough space to lay the entire length of pipe to "pull back" through the enlarged hole.~~

MT is better suited to situations that call for precise control of gradient and alignment. In this technique, two pits are excavated—one at either end of the segment—to the depth of the underground shaft. Hydraulic jacks in the launch pit then thrust against the wall of the pit to drive the cutting head horizontally through the ground. The size of the pits could be

considerable (*estimated at 30 feet by 15 feet by 20 feet deep*), depending on the machines being used, ground conditions, pipe length and material, length of drive, and type of installation. *Approximately 18,000 cubic feet of material would be excavated from the 2 pits.*

With either HDD or MT, private homes located next to Waimanalo Stream leave no space to physically excavate the pits. The same is true on the west side of Kahawai Stream where the Weinberg Village housing is located. Moreover, the excavation of the large pits would themselves have collateral environmental consequences, such as stockpiling excavated materials (likely mixed with groundwater) until used to refill the pits.

Mobilization cost is high because a large rig would have to be transported from the mainland.

The open-cut method was selected based on engineering and economic analysis of the alternatives. Given the relatively narrow streams to be crossed, construction using the open-trench method is expected to take two weeks, almost equal to the length of time it will take to set up and dismantle the tunneling equipment. Overall, construction is expected to be longer with MT and HDD.

The open-trench alternative will alter the stream channel during construction; however, there are construction practices to minimize any adverse impacts (as discussed in Section 4). Permits must be obtained from local, State, and federal agencies (see Table 1) and all construction work must comply with applicable environmental rules and regulations. Once completed, the open-cut alternative places the pipeline out of public view and reduces overall liability. Since the water line will be buried with a reinforced concrete jacket and not exposed, it will be less susceptible to corrosion, with the associated benefits of reducing repair costs and extending the life of the pipeline.

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6 SUMMARY OF PROPOSED MITIGATION MEASURES

Short-term environmental impacts will occur during construction of the proposed project. Motorists will experience some delays in traffic, particularly during Phase 1 along Kalaniana'ole Highway from the Olomana Golf Links to Poalima Street. Two lanes of traffic will be maintained as often as practicable. If one lane needs to be closed, flagmen would direct traffic, permitting traffic in one direction to flow while the other direction is stopped. Pedestrian and bicycle use of the makai shoulder would be restricted during construction. Similarly, construction on Poalima and Hihimanu Streets may require traffic to be limited to one lane, with flagmen directing traffic. To minimize inconvenience, information on the locations of construction activities, any lane closures or detours will be disseminated to the public. Ingress and egress from driveways and public streets will be provided at all times.

Construction will involve the use of heavy machinery for trenching, hauling material to and from the site, laying the pipeline, and resurfacing the roadway. Construction noise would be mitigated by adhering to the State Department of Health construction noise limits and curfew times. Dust control barriers erected adjacent to the residential and commercial lots and regular watering will be used to control fugitive dust.

Two stream crossings along the proposed alignment will be accomplished through burial using the open-cut method. Kahawai and Waimanalo Streams would each be diverted temporarily to one side of the streambed through the use of sheet piles and/or steel plate coffer dams. After the first half of the segment is completed, the stream will be re-diverted to the other side to complete the installation. In the case of Waimanalo Stream, there is already a concrete wall that divides the stream on the mauka side of the Kalaniana'ole Highway bridge. Stream flow will not be blocked completely at any time during construction. Temporary diversions at Waimanalo Stream and Kahawai Stream are estimated to last approximately 2-4 weeks for each stream channel. Construction work would be scheduled during the dry period of the year to the extent possible.

Water pumps will be used to discharge water from the construction area into settling tanks. The dewatering discharge will go through a dewatering treatment and filtration system that will remove silt, dirt, oil, grease, and suspended solids. A water quality monitoring plan will be established to verify the adequacy of the dewatering filtration system and to ensure that the proposed construction activities will not result in long-term adverse impacts to State waters. Water sampling will be performed before construction commences to define the water quality baseline, during construction activities, and after construction is completed. The water quality parameters to be measured include total suspended solids, dissolved oxygen, temperature, pH, turbidity, salinity, and oil and grease.

Best Management Practices that will be applied to minimize impacts to aquatic and riparian resources include the following:

- *All project-related materials should be placed or stored in ways to avoid or minimize disturbance to the aquatic environment;*

- *All project-related material should be free of pollutants*
- *No contamination of the aquatic environment (trash, debris, disposal, etc.) should result from project activities;*
- *A contingency plan to control accidental spills of petroleum products should be developed. Absorbent and containment booms should be stored on-site to facilitate the clean-up of petroleum spills;*
- *Turbidity and siltation from excavation activities should be minimized and contained to the immediate vicinity of excavation through the use of silt containment devices and the curtailment of excavation during adverse weather conditions; and*
- *Removal of riparian vegetation should be avoided or minimized.*

More detailed consultation regarding habitat for threatened and endangered water birds, including the 'alae 'ula and koloa, will occur during the Army Corps of Engineers' permit application review process for dredge and fill activities as regulated under Section 404 of the Clean Water Act. Potential mitigation measures, such as phasing the project to avoid prime nesting season and monitoring for nesting activities prior to construction, will be examined during the Section 7 consultation.

The native plants found alongside Kahawai Stream were planted at this site as part of a restoration project by the Waimanalo Community Health Center and is not a naturally occurring population. The BWS will inform the Waimanalo Health Center and the Waimanalo Watershed Project of the contractor's schedule so that salvageable plants can be temporarily removed. The irrigation line will also require temporary repiping. A revegetation plan will be developed to ensure that impacts to the restoration project are minimized and the banks are restored close to their original condition.

Because most of the project alignment occurs within a developed corridor, subsurface historic artifacts are not expected. However, the State Historic Preservation Division (SHPD) has expressed concern about the stream crossings and will be given an opportunity to review construction plans. Should any unidentified cultural remains be uncovered at any time during excavation operations in the roadways or stream channels, work in the immediate area will cease and the SHPD, Oahu Island Burial Council, and Office of Hawaiian Affairs will be contacted for further instructions, including possible procurement of a qualified cultural monitor.

Long-term environmental impacts are not anticipated. The contractor of this project will restore to their original condition all improvements, including pavements, embankments, curbs and gutters, signs, landscaping, structures, utilities, walls, and fences.

7 DETERMINATION

Based on the information described in this document, the proposed project is not expected to result in significant social, economic, cultural, or environmental impacts. Consequently, a finding of no significant impact is warranted pursuant to the provisions of Subchapter 6 of Chapter 200, Title 11, Hawaii Administrative Rules of the Department of Health.

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8 FINDINGS AND REASONS SUPPORTING THE DETERMINATION

This Environmental Assessment, prepared in accordance with Chapter 343, HRS, as amended, has found that the potential for impacts associated with the proposed action will not be significant, with the exception of unavoidable traffic disruptions and short-term disturbance to the stream environments. Potential environmental impacts will be temporary and are not expected to adversely impact the long-term environmental quality of the area.

The potential effects of the proposed project were evaluated based on the significance criteria in Section 11-200-12 (Hawaii Administrative Rules, revised in 1996). The following is a summary of potential effects of the action.

Significance Criteria

1. Irrevocable commitment to loss or destruction of natural or cultural resources.

The proposed project is not anticipated to adversely impact natural or cultural resources. The project is located within the rights-of-way of existing public streets and in areas that have been disturbed repeatedly by roadwork and installation of other utilities.

According to the State Historic Preservation Division (SHPD), roadways that rest on soil series composed of silty clay and loam, such as the soils found along the project corridor, are unlikely to contain significant historic sites because of past development; *however, any discovery during construction will be brought to the attention of the SHPD, Oahu Island Burial Council, and Office of Hawaiian Affairs. The SHPD will be given an opportunity to review detailed construction plans at the stream crossings.*

Construction associated with the stream crossings will affect the stream environments, but these impacts are expected to be temporary. A combination of best management construction practices and water quality monitoring plan will limit adverse impacts. Disturbance to the stream restoration project at Kahawai Stream will be mitigated by coordination with caretakers of the native plants and a revegetation plan.

2. Curtailment of the range of beneficial uses of the environment.

The use of public streets for public infrastructure is an appropriate, beneficial use of the man-made environment. Utility lines are commonly found under or alongside roadways, which also facilitates access for maintenance and repair operations.

3. Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed project is consistent with the environmental policies, goals, and guidelines defined in Chapter 344, HRS. The project is associated with improved resource use since an

efficient, well-designed piping network is an integral part of managing and consuming a valuable natural resource.

The project is consistent with the City and County Development Plan Public Facilities Map which indicates water system improvements as "determined for construction with 6 years." Additionally the project alignment is located in areas whose zoning designations permit utility installation.

4. Substantially affects the economic or social welfare of the community or state.

The project is intended to ensure the long-term transmission of potable water through an upgraded and reliable distribution system. Short-term negative impacts are associated with traffic disruptions and inconveniences to residents, customers, and business owners, and to commuters traveling along Kalaniana'ole Highway; however, mitigation measures will be implemented for the duration of the project to minimize traffic congestion.

5. Substantially affects public health.

The proposed project will be completed in accordance with Federal, State and City and County of Honolulu rules and regulations governing public safety and health. Primary public health concerns involve air quality, noise, traffic, and water quality impacts. However, it is expected that these impacts can be minimized or brought to negligible levels by appropriate use of the mitigation measures described in this document. Additionally, the contractor will be obligated to meet the environmental standards and procedures of various governmental agencies in the course of obtaining necessary permits.

At the same time, the project itself is expected to strengthen public health resources by helping to ensure the continued flow of potable water.

6. Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed project is part of a BWS program to improve its transmission and distribution system. Although the improvements are designed to serve current customers and to assist the BWS in meeting future demand, the project itself will not generate new population growth.

7. Involves substantial degradation of environmental quality.

As public roadways, the project area has been disturbed repeatedly in the past. All anticipated impacts will be temporary. Upon completion of the installation, the environmental quality of the area will return to as close to pre-construction conditions as possible.

8. Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for large actions.

The proposed project is supplemental to the existing water system and part of the long-range water master plan. The project is not expected to have significant effects on local, regional, and island-wide land use and/or population. It would not involve a commitment to larger actions.

9. Substantially affects a rare, threatened, or endangered species, or its habitat.

The koloa and 'alae 'ula, federally listed endangered birds have been observed in a highly modified segment of Kahawai Stream. Construction activities may cause these birds to forage elsewhere temporarily. ~~It is unlikely, however, that the koloa nest in the immediate area of Kalaniana'ole Highway.~~ *Measures to mitigate impacts on endangered water birds will be examined further during the Department of Army permitting process, which includes consultation associated with Section 7 of the Environmental Species Act.*

10. Detrimentially affects air or water quality or ambient noise levels.

There will be short-term impacts on the air quality and noise levels inside of and adjacent to the construction area. Mitigation measures will be implemented to minimize construction-related impacts. During the stream crossing section of construction, there may be temporary degradation of water quality. However, the BWS has established a series of mitigation measures, as described in Sections 4.1.5 and 4.2.3.

11. Affect or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.

Phase 1 of the project, along Kalaniana'ole Highway, borders the Special Management Area. However, the project area is not at high risk for tsunami inundation or flooding.

12. Substantially affects scenic vistas and view planes identified in county or state plans or studies

The water transmission main will be installed underground in the public right-of-way. There will be little visual evidence of the project when completed.

13. Requires substantial energy consumption.

Installation of the water main will require energy levels that are typical for a construction project of this type; no extraordinary energy consumption is anticipated.

Conclusion

The analysis contained in this Environmental Assessment has determined that the project will not have significant adverse impacts on the environment. Project impacts are expected to be temporary and will not irrevocably or irretrievably degrade environmental quality in the area. Therefore, the Honolulu Board of Water Supply has issued a Finding of No Significant Impact (FONSI) and concluded that an Environmental Impact Statement (EIS) is not required.

9 BIBLIOGRAPHY

City and County of Honolulu Board of Water Supply, January 1998. *Oahu Water Management Plan: Initial Revision to the Technical Reference Document.*

City and County of Honolulu Board of Water Supply, March 1995. *Oahu Water Plan.*

Federal Emergency Management Agency. *Flood Insurance Rate Map, Map No. 15003C0380 E.* Effective Date November 20, 2000.

Harrigan, June and Susan Burr. January 2001. "Total Maximum Daily Loads Estimated for Waimanalo Stream, Island of Oahu, Hawaii." (Final Draft) Prepared to U.S. Environmental Protection Agency Specifications by the Hawaii State Department of Health, Environmental Planning Office.

State of Hawaii, Commission on Water Resource Management, in Cooperation with the National Park Service, Rivers and Trails Conservation Assistance Program, December 1990. *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources.*

State of Hawaii. Department of Health, Environmental Planning Office, Stream Bioassessment Program. March 1998. "Biological Assessment and Habitat Characterization of Waimanalo Stream: Establishing Environmental Goals and a TMDL for Watershed Management."

State of Hawaii, Department of Business and Economic Development. *State of Hawaii Data Book 1998: A Statistical Abstract.* On-line edition.

U.S. Department of Agriculture, Soil Conservation Service, in Cooperation with the University of Hawaii Agriculture Experiment Station. August 1972. *Soil Survey of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii.*

U.S. Fish and Wildlife Service, 1999. Fish and Wildlife Service Species List, Plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, Hawaii.

U.S. National Weather Service, Forecast Office, Honolulu, HI. Conversation with David Meek, September 22, 2000.

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10 ORGANIZATIONS AND AGENCIES CONSULTED

10.1 Organizations and Agencies Consulted during Preparation of the Draft EA

State Historic Preservation Division, Dept. of Land and Natural Resources
City and County of Honolulu, Dept. of Planning and Permitting

10.2 Organizations and Agencies Consulted in Reviewing the Draft EA

The Draft Environmental Assessment (DEA) was published in the July 8, 2001 issue of the Office of Environmental Quality Control (OEQC) *Environmental Notice*. The organizations and agencies listed below were contacted during the 30-day comment period for the Draft Environmental Assessment. In addition, a copy of the DEA was placed at the Waimanalo Public Library for public review. A presentation to the Waimanalo Neighborhood Board was made on November 5, 2001. Written comments were submitted by 13 agencies and organizations (shown with an asterisk). All comment letters and BWS responses are included in this document.

Federal Agencies

*Army Corps of Engineers, Pacific Ocean Division
Department of the Interior
 *U.S. Fish and Wildlife Service
 U.S. Geological Survey
Marine Corps Base Hawaii, Environmental Department

State Agencies

Department of Business, Economic Development & Tourism, Office of Planning
*Department of Hawaiian Home Lands
Department of Land and Natural Resources
 Aquatic Resources
 *Commission on Water Resources Management
 *State Historic Preservation Division
Department of Health
 Environmental Management Division
 *Office of Environmental Quality Control
*Department of Transportation, Highways Division
*Office of Hawaiian Affairs
University of Hawaii, Environmental Center

City and County of Honolulu

Department of Design and Construction
Department of Environmental Services
*Department of Planning and Permitting

Department of Transportation Services

*Fire Department

*Police Department

Private and Community Organizations and Elected Officials

Councilmember John Henry Felix

*Hawaiian Electric Company

State Representative Joe Gomes

State Senator Fred Hemmings

Verizon Hawaii

Waimanalo Health Center

Waimanalo Neighborhood Board No. 32

*Waimanalo Watershed Project



STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 COMMISSION ON WATER RESOURCE MANAGEMENT
 HONOLULU, HAWAII 96809

July 13, 2001

Mr. Gregory Lee
 Board of Water Supply
 City & County of Honolulu
 630 South Beretania Street
 Honolulu, HI 96809

Dear Mr. Lee:

Draft EA -- Kalaiananole 36-Inch Water Main

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

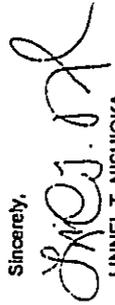
In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas, which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.

Mr. Gregory Lee
 Page 2

- Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.
- If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).
- If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.
- OTHER:

If there are any questions, please contact Ryan Imata at 587-0255.

Sincerely,

 LINNET T. NISHIOIKA
 Deputy Director

Riky

c. Office of Environmental Quality Control
 Kimura International, Inc.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERKELEY STREET
HONOLULU, HI 96844



August 30, 2001

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CHARLES STEW Vice-Chairman
JAMES L. AMI
MERRITT E. KAOPIA SR
BARBARA D. STANTON
BRUCE S. NEMAL SR-Officer
ROSS S. SASAKURA SR-Officer
CLIFFORD S. JAMILE
Manager and Chief Engineer

Ms. Linnel Nishioka, Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Nishioka:

Subject: Your Letter of July 13, 2001 on the Draft Environmental Assessment for the
Proposed Kalaniana'ole Highway 36-Inch Transmission Main, Koolaupeke, Oahu

Thank you for reviewing the Draft Environmental Assessment for the proposed transmission
main project.

We acknowledge the need for a stream channel alteration permit should the project alter the
bed and banks of any stream.

If you have any questions, please contact Scot Muraoka at 527-5221.

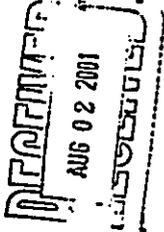
Very truly yours,

Scot Muraoka
for CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Glenn Kimura, Kimura International, Inc.

ID. #
cc *Maintenance Engineering*
S. Muraoka

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAUA STREET, SUITE 405E - HONOLULU, HAWAII 96819-1055
TELEPHONE: (808) 931-7761 - FAX: (808) 931-7770 - INTERNET: WWW.HONOLULU.HI



ATTILIO K. LEONARDI
FIRE CHIEF
JOHN CLARE
DEPUTY FIRE CHIEF

July 25, 2001

TO: CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

ATTENTION: GREGORY LEE

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: KALANIANA'OLE HIGHWAY
36-INCH WATER MAIN
OAHU, KOOLAUPOKO DISTRICT
TAX MAP KEY: 4-1-008, 009, 013, 015, 018, 022-024, 026, 028, AND 032

We are commenting on a letter from Kimura International, Inc. dated July 5, 2001, regarding your proposal to install a 36-inch water transmission main in the public right-of-way through portions of Waimanalo.

The Honolulu Fire Department requests that you comply with the following:

1. Maintain fire apparatus access throughout the construction site for the duration of the project.
2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

Attilio K. Leonard
ATTILIO K. LEONARDI
Fire Chief

AKLKS:jo

cc: Glenn Kimura, Kimura International, Inc.
Office of Environmental Quality Control

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
830 SOUTH BERTANHA STREET
HONOLULU, HI 96843



August 30, 2001

ATTENTION: JAMES
EDDIE FLORES, JR. Chairman
CHARLES STED, Vice-Chairman
JANUARY AUM
HENRY B.K. KAOPIA, SR.
BARBARA BEM STANTON
BRUNO E. BIRNBAUM, Esq.
ROSIE S. SALOMON, Esq.
CLIFFORD S. JAMILE
Manager and Chief Engineer

TO: ATTILIO K. LEONARDI, FIRE CHIEF
HONOLULU FIRE DEPARTMENT

FROM: *CL* CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF JULY 25, 2001 ON THE
DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED KALANIANA'OLE HIGHWAY 36-INCH
TRANSMISSION MAIN, KOOLAUPOKO, OAHU

Thank you for reviewing the Draft Environmental Assessment for the proposed transmission main project.

We have the following response to your comments:

1. Fire apparatus access will be maintained throughout the construction site for the duration of the project.
2. If any interruptions in water service occur to the existing fire hydrant system, the Fire Communication Center will be notified.

If you have any questions, please contact Scott Muraoka at 527-5221.

cc: Glenn Kimura, Kimura International, Inc.
Io/SM
cc: Maintenance - Engineering
S Muraoka

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 929-3111
<http://www.honolulu.gov>
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR



LEE D. DONOHUE
CHIEF
MICHAEL CARVALHO
ROBERT AU
DEPUTY CHIEFS

RECEIVED
JUL 31 2001

OUR REFERENCE CS-KP

July 26, 2001

TO: CLIFFORD S. JAMILE, DIRECTOR
BOARD OF WATER SUPPLY

ATTENTION: GREGORY LEE

FROM: LEE D. DONOHUE, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
KALANIANA'OLE HIGHWAY 36-INCH TRANSMISSION MAIN
TAX MAP KEY NUMBERS: 4-1-08, 09, 13, 15, 18, 22-24, 26, 28, 32

Thank you for the opportunity to review and comment on the subject project.

We have no objection to this proposal. However, we anticipate construction-related dust, noise, and traffic complaints as a result of this project. In an effort to minimize the calls for service to the area, we would like to recommend that Major Susan Dowsett of District 4 be contacted so that adequate police coverage and response can be planned.

If there are any questions, please contact Ms. Carol Sodeatal of the Support Services Bureau at 529-3658.

LEE D. DONOHUE
Chief of Police

By *Eugene Uemura*
EUGENE UEMURA
Assistant Chief of Police
Support Services Bureau

cc: OEQC
Mr. Glenn Kimura, Kimura International, Inc. ✓
Striving and Protecting with Aloha

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HI 96813



August 30, 2001

JERRY HARRIS Mayor
EDIE FLORES, Jr. Chairman
CHARLES ETD. YON-CHANG
JAMILE, AILE
HOMER S.S. SAOPUA SA
BARBARA TOM STANTON
SHANE K. MURRAY E-Comm
ROSS S. SALAMONIA E-Comm
CLIFFORD S. JAMILE
Manager and Chief Engineer

TO: LEE D. DONOHUE, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

FROM: *BU* CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF JULY 26, 2001 ON THE
DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED KALANIANA'OLE HIGHWAY 36-INCH
TRANSMISSION MAIN, KOOLAUPOKO, OAHU

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

We have the following response to your comments:

1. The Board of Water Supply currently requires all construction work to comply with dust and noise limits set forth by the State Department of Health.
2. Temporary traffic impacts during construction will be mitigated through an approved traffic control plan.
3. Major Susan Dowsett of District 4 will be contacted to ensure adequate coordination with the Police Department for the duration of the project.

If you have any questions, please contact Scot Muroka at 527-5221.

cc: Glenn Kimura, Kimura International, Inc.

IO: *JP*
cc: *Maintenance - Engineering*
S Muroka

DL-1318

Part Water... our greatest need - use it wisely.

FOR NAME & ADDRESS
SEE FRONT OF MAILING



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

PETITIONING PRESERVATION DIVISION
1505 ALI'OLE DRIVE, SUITE 400
HONOLULU, HAWAII 96813

July 26, 2001

Gregory Lee
Board of Water Supply
City and County of Honolulu
6300 South Beretania Street
Honolulu, Hawaii 96813

LOG NO: 27904 ✓
DOC NO: 0107EJ26

Dear Mr. Lee:

SUBJECT: Chapter 6E-8 Historic Preservation Review – Draft Environmental Assessment (DEA) for the Kalaiansole Highway 36-inch Main, Waimanalo to Olomana Golf Links, Phase 1 and 2
Waimanalo, Ko'olaupoko, O'ahu
TMK: 4-1-08-09-13-15-1B-22-24-28-32

Thank you for the opportunity to comment on the DEA for the Kalaiansole Highway 36-inch Main, Waimanalo to Olomana Golf Links, Phase 1 and 2. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project area.

The Board of Water Supply proposes the installation of a 36-inch water transmission main in the public right-of-way along Kalaiansole Highway, extending from the entrance of Olomana Golf Links to Poalima Street. The route then continues from Poalima Street onto Hihimanu Street and terminates at the Nonokio Street intersection. The pipeline measures approximately 10,400 lineal feet (c. 2miles).

SHPD provided comment in December 1999 to Kimura International during pre-consultation review for this project. Our complete comments are included as Appendix D of the DEA. However, Sections 4.3.4 and 8.1 of the DEA should clarify that although SHPD believes that installation of the water main within the existing roadways in Waimanalo will have "an effect" on significant historic sites, SHPD has concerns regarding the area of the stream crossings. Our previous comment letter states:

Gregory Lee
Page Two

"With regard to the stream crossings, we request that when construction plans become available, our office be given the opportunity to review them in order to determine what impacts, if any, there may be on the two streams within the project area."

In addition, please note that a National Historic Preservation Act Section 106 Review may need to be conducted if a US Army Corps permit or "letter of permission" is needed; this should be included in Section 1.3 (Permits Required or Potentially Required).

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdan at 692-8027.

Aloha,

Dawn Hibbard, Administrator
State Historic Preservation Division

Eljck

c: Glenn Kimura, Kimura International, Inc., 1600 Kapiolani Boulevard, suite 1610, Honolulu, Hawaii 96814

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
830 SOUTH BERKELIANA STREET
HONOLULU, HI 96843



August 30, 2001

Mr. Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamohila Boulevard, Room 555
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: Your Letter of July 26, 2001 on the Draft Environmental Assessment for the
Proposed Kalahele Highway 36-Inch Transmission Main, Keoluopoko, Oahu

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed
transmission main project.

We have the following response to your comments:

1. The construction plans will be submitted for your review to determine what
impacts, if any, there may be on the two streams in the project area.
2. We note that a National Historic Preservation Act, Section 106 Review may be
conducted if a U.S. Army Corps Permit or "Letter of Permission" is needed.
Therefore, this review will be included in Section 1.3 (Permits Required or
Potentially Required) of the Final EA.

If you have any questions, please contact Scot Murawka at 527-5221.

Very truly yours,

Bary Uegawa
for CLIFFORD S. JAMBLE
Manager and Chief Engineer

cc: Glenn Kimura, Kimura International, Inc.

IOISM.js

cc: Maintenance - Engineering

S Murawka

For Water - our friend and - use it wisely!

VUR-145/a

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BARBARA JOE STANTON
BRADY E. SHIMAZU, Esq. Clerk
ROSE E. SUGIMOTO, Esq. Clerk
CLIFFORD S. JAMBLE
Manager and Chief Engineer



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOMELANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

July 27, 2001

Mr. Gregory Lee
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Lee:

Subject: Kalaniana'ole Highway, 36-inch Water Main, Oahu

Thank you for providing a copy of the May 2001 draft environmental assessment report for the subject water main project prepared by Kimura International Inc.

Water service reliability should be improved to the Department of Hawaiian Home Lands' residential homestead areas in Waimanalo when this project is completed.

Residents and other roadway users will appreciate early notification of lane closures and detours.

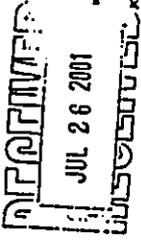
Households being served by the 40-years-old 20-inch main which has experienced several breaks would like information on plans and timing for upgrading of that network.

We have no other comments to offer. If you have any questions, please call Joe Chu at 586-3836.

Aloha,

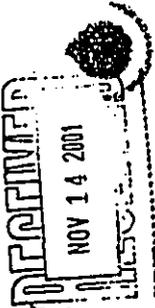
Raynard C. Soon
Raynard C. Soon, Chairman
Hawaiian Homes Commission

c: OEQC
Kimura International, Inc.



RAYNARD C. SOON
CHAIRMAN
HAWAIIAN HOMES COMMISSION
JOHN M. & M. YAMAGUCHI
BOARDS TO THE CHAIRMAN

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843



November 7, 2001

Mr. Raynard C. Soon, Chairman
Department of Hawaiian Home Lands
State of Hawaii
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Soon:

Subject: Your Letter of July 27, 2001 on the Draft Environmental Assessment for the Proposed Kalaniana'ole Highway 36-Inch Transmission Main, Kapoleia, Oahu

Thank you for reviewing the Draft Environmental Assessment for the proposed transmission main project.

We have the following responses to your comments:

1. The parallel mains will increase water service reliability to Waimanalo when the project is completed.
2. Residents will be informed of plans and timing of the water system upgrades prior to construction. We plan to combine Phase I of our project along Kalaniana'ole Highway from Olomana Golf Course to Poalima Street with the State Department of Transportation's Kalaniana'ole Highway Widening project to minimize traffic impacts and cost. Construction is anticipated to begin in late 2003 or early 2004. Residents and other roadway users will be informed of lane closures and detours prior to any construction activities.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,

Barry Hagan

CLIFFORD S. JAMBLE
Manager and Chief Engineer

cc: Glenn Kimura, Kimura International, Inc.

SEBASTIAN HARRIS, Mayor
EDDIE FLORES, Councilmember
CHARLES A. ITO, Councilmember
JANET L. AMI, Councilmember
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BORIBORIKOMI STANTON
BRYAN K. SHIMADA, Ex-Officio
ROSS S. SUGIMURA, Ex-Officio
CLIFFORD S. JAMBLE
Manager and Chief Engineer

Aug-13-01 MON 14 55 PM

FAX

PAGE 1



DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Honolulu
FT. SHAFTER, HAWAII 96843

WR-148/01

ATTENTION

August 1, 2001

Civil Works Technical Branch

Mr. Gregory Lee
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Lee:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Kalaniana'ole Highway, 36-Inch Water Main, Oahu (THKs 4-1-8, 9, 13, 15, 18, 22-24, 26, 28, and 32). The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

- a. The construction of stream crossings by use of an open-cut (trenching) method will require a DA permit. The applicant should contact Mr. Peter Galloway of our Regulatory Branch at (808) 438-8416 and refer to file number 200100418.
- b. The flood hazard information provided on page 3-6 of the DEA is correct.

Should you require additional information, please contact Ms. Jessie Dobanchick of my staff at (808) 438-8876.

Sincerely,

James Pennaz
James Pennaz, P.E.
Chief, Civil Works
Technical Branch

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843



August 30, 2001

Mr. James Pennaz, P.E., Chief
Civil Works Technical Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96843-5440

Dear Mr. Pennaz:

Subject: Your Letter of August 1, 2001 on the Draft Environmental Assessment for the Proposed Kalaniana'ole Highway 36-Inch Transmission Main, Koolauopoko, Oahu.

Thank you for reviewing the Draft Environmental Assessment (DEA) for the proposed transmission main project.

We have the following response to your comments:

- 1. We acknowledge that a Department of the Army permit will be required if any stream is crossed using an open-cut method of construction. The stream crossings will be coordinated with Peter Galloway of your Regulatory Branch with reference to Job File Number 200100418.
- 2. We note that the flood information provided on pages 3-6 of the Draft EA is correct.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,

Berry Hageawa
for CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Kimura International, Inc.

ID: 5
cc: J. Mauerana - Engineering
S. Muraoka
WR-148/01

Part Water - our greatest need - our friends!

RECEIVED NAMES: Mayor
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HELENI K. K. KAPUKA, SR.
BANGALUA UM STANTON
SHARON M. MALI, Executive
ROSSE S. SASAMURA, Executive
CLIFFORD S. JAMILE
Manager and Chief Engineer

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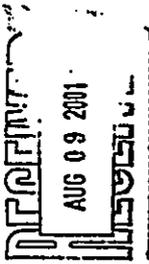
3

PHONE (808) 544-1443



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLAHU BOULEVARD, SUITE 800
HONOLULU, HAWAII 96813

FAX (808) 544-1445



August 6, 2001

Gregory Lee
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Subject: Kalaniana'ole Highway, Board of Water Supply 36-inch Water Main

Dear Mr. Lee:

Thank you for the opportunity to comment on the draft environmental assessment for the above referenced project. OHA is concerned about the project's potential impacts on cultural resources.

Notification of Inadvertent Discoveries of Iwi

As this project will involve ground-disturbing construction activities, special care should be given to the project's potential impacts on human remains. The draft EA states that if previously unidentified remains are encountered, work will cease and the appropriate government agencies will be contacted. This statement must be revised to specifically identify the State Historic Preservation Division, the O'ahu Island Burial Council and the Office of Hawaiian Affairs, pursuant to HRS Chapter 6c.

Use of a Cultural Monitor

It may also be appropriate to utilize a cultural monitor to assist with the handling of native Hawaiian remains found inadvertently during construction. Use of a cultural monitor is recommended in the May 2001 Policies and Procedures Regarding Na Iwi Kupuna which was developed for a Board of Water Supply forum. The cultural monitor should have some understanding and practice in the use of Hawaiian cultural protocol, ability to relate with sensitivity to the handling of Native Hawaiian remains, and possess traditional knowledge of families, the history and genealogy of the area. The cultural monitor should also have the ability to keep accurate records, including a daily log, draw site plans, maps, and write descriptions.

Historic Taro Cultivation Sites
SHPD indicated that the project may have the potential to affect historic sites, based on the locations of the stream crossings. The proposed stream crossings at Waimanalo and Kahawai streams may affect historic sites relating to taro cultivation. The draft EA notes SHPD's concern but does not address the impact of the stream crossing on these historic sites. OHA requests that the final EA address this issue.

If you have any questions, please contact Siaria Manley, Policy Analyst at 594-1944.

Sincerely,

Colin C. Kippen, Jr.
Deputy Administrator

CK: sam

cc: OHA Board of Trustees
Clyde Namu'o, Administrator
Office of Environmental Quality Control
Glenn Kimura, Kimura International, Inc.

OCT 10 01 38 FX
BOARD OF WATER SUPPLY
AND COUNTY OF HONOLULU
SOUTH BERETANIA STREET
HONOLULU HI 96843

FAX



PAGE 1

ALBERT HARRIS, Manager

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SUSAN M. LEE, Member
MELANIE M. MANNING, SR.
RODNEY S. SAMUELS, SR., Chairman

CLIFFORD S. JAMILE
Manager and Chief Engineer

August 30, 2001

Mr. Colin C. Kippen, Jr.
Deputy Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Dear Mr. Kippen:

Subject: Your Letter of August 6, 2001 on the Draft Environmental Assessment for the Proposed Kalahele Highway 36-Inch Transmission Main, Koolapoko, Oahu.

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

We have the following response to your comments:

1. Notification of Inadvertent Discoveries of Iwi

The Final EA will identify the State Historic Preservation Division (SHIPD), the Oahu Island Burial Council, and the Office of Hawaiian Affairs as the agencies to be contacted in the event that iwi or other cultural artifacts are discovered.

2. Use of a Cultural Monitor

If native Hawaiian remains are inadvertently discovered during construction activities, the Board of Water Supply will consider the procurement of a qualified cultural monitor.

OCT 10 01 38 FX

FAX

PAGE 7

Mr. Colin C. Kippen, Jr.
August 30, 2001
Page 2

3. Historic Taro Cultivation Sites

The letter from SHIPD, dated December 8, 1999, refers to the possibility that historic taro cultivation sites may be present in "undeveloped areas of the stream channels." Proposed stream crossings, for both Waimanalo Stream and Kahawai Stream, are located in places where the stream channels are lined with concrete. The process of channelization itself is likely to have disturbed the environment, thereby diminishing the probability of finding historic artifacts. As a precaution against any unintended impacts, the construction plans will be submitted to SHIPD for further examination.

If you have any questions, please contact Scot Murdock at 527-5721.

Very truly yours,

Clifford S. Jamile
for CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Glenn Kimura, Kimura International, Inc.

Id: Maintenance - Engineering
cc: Murdock

WR-150/01

(10/24)

JERRY HARRIS, Mayor
KOE FLORES, Jr., Chairman
CHARLES A. ETTO, Vice-Chairman
JIM KELLY, At-Large
ROBERT B. KAOPIA, Sr.
MARGARET STANTON
BRIAN K. SHAW, Sr. Clerk
ROSE S. SHAW, Sr. Clerk
CLIFFORD S. JAMILE
Manager and Chief Engineer



BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
15 SOUTH BERETANIA STREET
HONOLULU, HI 96813

October 24, 2001

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

Dear Ms. Salmonson:

Subject: Your Letter of August 6, 2001 on the Draft Environmental Assessment for the Proposed Kaimanole Highway 36-Inch Transmission Main, Koolanoko, Oahu.

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

We provide the following response to your concerns:

1. The Final EA will include a list of agencies contacted in preparing the Draft EA.
2. The project area is confined to the existing public right-of-way which avoids impacts to cultural resources and practices. The project corridor has been extensively disturbed by prior construction activities and utility installations.
3. The U.S. Fish and Wildlife Service has provided initial comments on the issue of potential impacts on threatened and endangered waterbirds and their habitats. The matter will be examined further during consultation required by Section 7 of the Endangered Species Act. This consultation will occur as part of the review process for the U.S. Corps of Engineers permit for dredge and fill activities, regulated under Section 404 of the Clean Water Act.

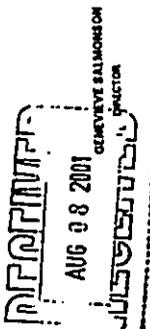
If you have any questions, please contact Soot Muroka at 527-5221.

Very truly yours,

Benny Hargrave
for CLIFFORD S. JAMILE
Manager and Chief Engineer

To: SM:js
Cc: MKK
G. Kuo
S. Muroka
WR-149/01

File Name: [unclear] - see if correct



BENJAMIN J. CAYetano
Deputy Mayor

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
130 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
TELEPHONE (808) 534-4100
FACSIMILE (808) 534-4100

August 6, 2001

Mr. Clifford Jamile, Manager and Chief Engineer
Mr. Gregory Lee
Board of Water Supply, City and County of Honolulu
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Mr. Glenn Kimura,
Kimura International, Inc.
1600 Kapi'olani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Dear Messrs. Jamile, Lee, and Kimura:

Having reviewed the draft environmental assessment for the City's proposed installation of a 36-inch water transmission main through portions of Waimanalo, we offer the following comments for your consideration.

1. EARLY CONSULTATION BEFORE WRITING THE DRAFT ENVIRONMENTAL ASSESSMENT: Section 11-200-9(a)(1), Hawaii's Administrative Rules, requires early consultation with agencies, citizen groups and individuals prior to the preparation of a draft environmental assessment. Please include a listing of these parties and copies of any written comments they may have submitted to you as a part of this process.
2. CULTURAL IMPACTS. Section 3.3.4 is entitled "Archaeological, Historic, and Cultural Resources" but the paragraph only addresses seven historic and archaeological sites. This section also needs to include information on current cultural resources and practices in the region and impacts the project may have on these resources or practices. This information may be obtained by consulting with knowledgeable cultural practitioners in the Waimanalo region. Chapter 343, Hawaii's Revised Statutes now requires that these cultural impacts be assessed (see enclosed copy of Act 50, SLH 2000). A copy of the Environmental Council's guidelines for assessing cultural impacts is enclosed for your use.
3. KOLOA AND OTHER ENDANGERED FAUNA. Please check with the U.S. Fish and Wildlife Service on possible mitigative measures to protect the Koloa (*Aneides wyvillei*) and other endangered or threatened fauna during construction of the water line.

If there are any questions, please call Leslie Segundo of my staff at (808) 586-4185. Thank you for the opportunity to comment.

Sincerely,
Genevieve Salmonson
for GENEVIEVE SALMONSON
Director

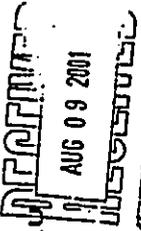
Enclosures

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

430 SOUTH KING STREET - HONOLULU, HAWAII 96813
TELEPHONE: (808) 522-4414 • FAX: (808) 527-5733 • INTERNET: www.cc.honolulu.hi



JEREMY HARRIS
Mayor



RANDALL K. FUJIKI, AIA
MANAGER

LEWIS A.C. CHOI
SOUTH DIRECTOR

2001/CLOG-2982(RY)

August 7, 2001

TO: CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

ATTN: GREGORY LEE

FROM: RANDALL K. FUJIKI, AIA, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE
KALANIANA'OLE HIGHWAY 36-INCH WATER MAIN,
KOOLAUPOKO, OAHU

We have reviewed the subject document and have no comments except to point out that on Section 4.1.2 Soils, the bullet that refers to "City and County of Honolulu's Grading, Grubbing and Stockpiling Ordinance No. 3968, (1999)" should be revised to "Chapter 14, Articles 13, 14, 15 and 16, Revised Ordinances of Honolulu, as amended."

Thank you for the opportunity to comment. If you have any questions, please call Raymond Young of our staff at 527-5839.

RKF:lh
6cc: 104128

cc: ✓ Glenn Kimura, Kimura International, Inc.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERTANHA STREET
HONOLULU, HI 96843



August 30, 2001

TO: RANDALL K. FUJIKI, AIA, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: *RM* CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF AUGUST 7, 2001 ON THE
DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED KALANIANA'OLE HIGHWAY 36-INCH
TRANSMISSION MAIN, KOOLAUPOKO, OAHU

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

Reference to the City and County of Honolulu's Grading, Grubbing and Stockpiling Ordinance will be revised in the Final EA.

If you have any questions, please contact Scot Muracko at 527-5221.

cc: Glenn Kimura, Kimura International, Inc.

IO:ls
cc: *SS* Muracko

01-1341

- ✓ KERRY HARRIS, Mayor
- ✓ EDGIE FLORES, Jr., Chairman
- ✓ CHARLES STEG, Vice-Chairman
- ✓ ANJULY AMB
- ✓ HERBERT K. KAPOKA, Sr.
- ✓ MANAMA OMI STANTON
- ✓ BRUCE SHIMAU, Ex-Officio
- ✓ ROSS E. SASAMURA, Ex-Officio
- ✓ CLIFFORD S. JAMILE, Manager and Chief Engineer

BENJAMIN CAFFRAY
GOVERNOR

RECEIVED
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5087

AUG 22 2001

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BRAUNE L. MURRAY
DIRECTOR
DEPUTY DIRECTORS
GLENN M. OKAMOTO
JANET Y. LINDSAY

myeng
WR

WIREPLY REFER TO
HWY-PS
2.3731

AUG 31 10 00 AM '01

Board of Water Supply
Page 2

HWY-PS 2.3731

If you have any questions, please contact Ronald Tszuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,

Brian K. Minnai
BRIAN K. MINNAI
Director of Transportation

Enclosure

C: State Office of Environmental Quality Control (w/enclosure)
Kimura International, Inc., Attn: Glenn Kimura (w/o enclosure)

Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Attn: Gregory Lee

Gentlemen:

Subject: Draft Environmental Assessment (EA), Kalaianaoale Highway 36-inch Transmission Main, Waimanalo to Olomana Golf Links Phases 1 & 2

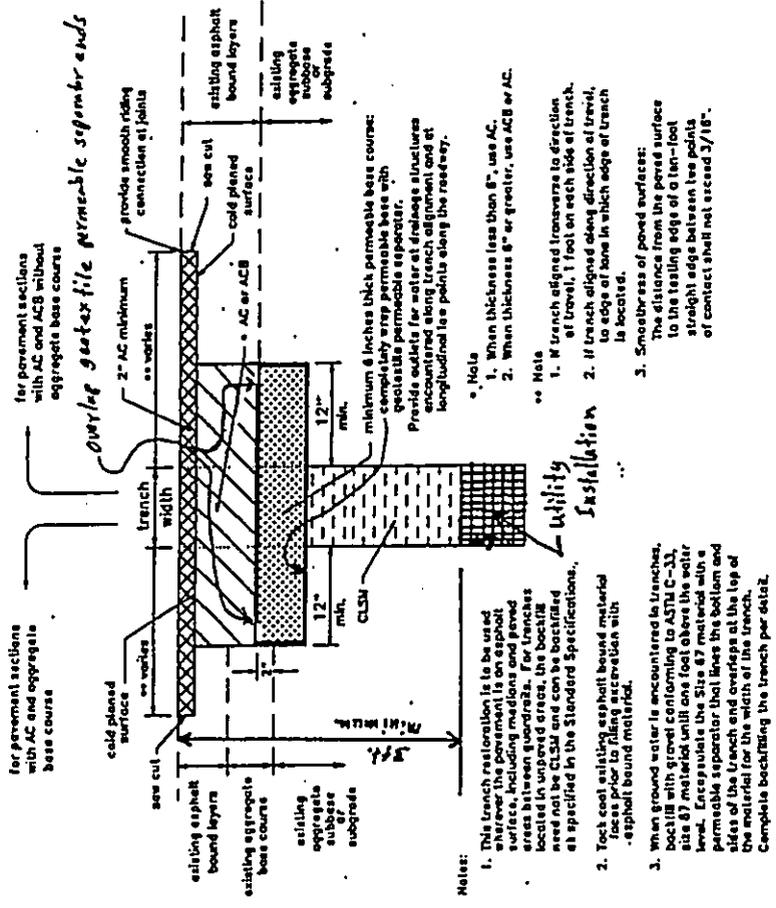
Thank you for consulting us. We have the following comments.

1. Please clarify what type of material was used for the existing 20-inch water main within our State Highway Right-of-Way (ROW). If asbestos was used, the existing pipe must be removed rather than abandoned in place.
2. We request that the new water main be placed as close as possible to the edge of our State ROW.
3. As noted in the Draft EA, plans for work within our ROW must be submitted for our review and approval. Horizontal and vertical controls and invert elevations must be shown on plans. Please revise figure 3 to incorporate the requirements of our latest State highway trench detail. A copy is enclosed.
4. So that the new water main will not interfere with future rehabilitation of our existing bridges, please coordinate both the alignment and design of stream crossings with our Highways Division Bridge Design Section.

**Requirements for
Asphalt Pavement Restoration Over Trench Excavations**
For
**Existing Pavements without
Permeable Base**
02/27/01

Design Requirements

1. The detail "Asphalt Pavement Restoration Over Trench Excavations for Existing Pavements without Permeable Base" applies to trench restorations constructed wherever the pavement is an asphalt surface and the pavement section does not contain a permeable base, including medians and paved areas between guardrails. For trenches located in unpaved areas, the backfill need not be CLSM and can be backfilled as specified in the Standard Specifications.
2. Typically backfill trench with CLSM in accordance with Section 313 of the Standard Specification and its special provisions. For areas where trenches are to be placed in very steep grades, backfill with ASTM C-33, Size 67 material. Encapsulate the Size 67 material with a permeable separator that lines the bottom and sides of the trench and overlaps that the top of the material for the width of the trench. If CLSM cannot be installed, provide explanation.
3. When ground water is encountered in trenches, backfill with ASTM C-33, Size 67 material until one foot above the water level. Encapsulate the Size 67 material with a permeable separator that lines the bottom and sides of the trench and overlaps that the top of the material for the width of the trench.
4. Provide outlets for water at drainage structures encountered both along the trench alignment and at the longitudinal low points along the roadway. When no drainage structures are available, discharge the water out to the slopes of the embankment, ditches, or other drainage facilities located at the longitudinal low points along the roadway and at intervals of approximately 500 feet. Provide details for the outlets and show outlet locations on the plans.
5. Restoration of the pavement surface
 - For trenches aligned along the longitudinal direction of the roadway or skewed at angle of less than 45 degrees to the longitudinal direction of the roadway, restore the roadway surface in a manner that does not result in longitudinal paving joints between the lane markings or on the paved shoulders. Provide a minimum of two inches thickness for the new AC layer. Include the cost for the removal of the existing markings and the installation of new pavement markings. Provide plans for the installation of the new pavement markings.



**Asphalt Pavement Restoration
Over Trench Excavations**
for
**Existing Pavements without
Permeable Base**

proposed restoration section

revision 2/26/01

urn 1100.0r2
original 06/05/00

- Material placed under water need not be compacted.
- Material placed above water:
 - i. Place material in uniform horizontal layer not exceeding 9 inches in loose thickness
 - ii. Compact each layer with 8 passes of a vibrating plate compactor. Use hand tamper if trench too narrow to accommodate the vibrating plate compactor.

BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU
 830 SOUTH BERETANIA STREET
 HONOLULU, HI 96843



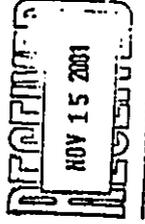
November 9, 2001

JEREMY HARRIS, Mayor
GOODY
 EDIE F. LEE, Deputy Mayor
 CHARLES A. KILPATRICK, Chairman
 JAMES L. HUI, Member
 HERBERT H. KAOUPUA, DR.
 BARBARA JOE STANTON
 BRUCE K. UNALU, ELOHUA
 ROSS S. SASAMURA, ELOHUA
 CLYDE FORD & JAMES E.
 Managers and Chief Engineer

Mr. Brian Minaai, Director
 Department of Transportation
 State of Hawaii
 869 Punchbowl Street
 Honolulu, Hawaii 96813-5097

Dear Mr. Minaai:

Subject: Your Letters of August 22, 2001 on the Draft Environmental Assessment for the Proposed Kalaniana'ole Highway 36-Inch Transmission Main (HWY-PS 2-3731), Koolauopoko, Oahu and of September 13, 2001 Combining the Kalaniana'ole Highway Improvements (Project ID No. 0072P01) With the 36-Inch Water Main Project



Thank you for reviewing the Draft Environmental Assessment (DEA) and for accepting the proposal to combine this water main project with the Kalaniana'ole Highway improvements. The water main construction schedule is flexible and will be adjusted concurrent with your State highways construction schedule.

We have the following response to your comments on the DEA:

1. The existing 20-inch water main is a concrete cylinder pipe and does not contain asbestos. The 20-inch water main, when taken out of service, may be rehabilitated to distribute potable or nonpotable water.
2. The proposed water main will be located as close as possible to the edge of the State Right-of-Way (ROW).
3. Construction plans for work within the State ROW will be submitted to your department for review and approval. The horizontal and vertical controls and invert elevations will be included on the plans. Figure 3 in the Draft EA will be revised to show the latest highway trench detail.

Mr. Brian Minzai
November 9, 2001
Page 2

- 4. The project stream crossing alignment and design will be coordinated with the Highways Division Bridge Design Section as to not interfere with future rehabilitation of the existing bridges.

Thank you for accepting our proposal to combine the projects. We believe this action will minimize impacts to the community by shortening the total construction duration, allowing more lanes to remain open during pipeline construction and reduce costs.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,



CLIFFORD S. JAMILE
Manager and Chief Engineer

Attachments

cc: Gilem Kimura, Kimura International, Inc.

SEP 19 2001
DIR III
HWY-DS 2.4064

Mr. Clifford S. Jamile
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street,
Honolulu, Hawaii 96813

Dear Mr. Jamile:

Subject: Proposed State Department of Transportation Kalaianaoale Highway Widening/Realignment (ID No. 0072F01), Olomana Golf Links to Waimanalo Beach Park

After review of your letter with the attached exhibit for Job 00-111, Kalaianaoale Hwy. 36-inch main from Waimanalo to Olomana Phase-1, the project limits for the BWS project is overlapped by the future State Department of Transportation (SDOT) Kalaianaoale Highway Improvements, Olomana Golf Course to Waimanalo Beach Park project.

At this time, SDOT is in the process of soliciting community input in refining the scope for the improvement project. The segment from Flamingo Street to Poalima Street will most likely be widened to accommodate new left turning lanes, but SDOT does not have any plans to realign Kalaianaoale Highway.

It may be feasible to include the watertine work in our project, however, we are not sure if the projects will be compatible from a schedule standpoint. Our estimated start of construction for the improvement project will be in the late 2003 or early 2004, contingent on when construction funds become available. If your watertine project can be delayed for this duration, SDOT is agreeable to include the watertine concurrently with our improvement project.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
620 SOUTH BERTANAGA STREET
HONOLULU, HI 96843

- JORDAN HARRIS, Mayor
- EDIE FLORES, Jr., Chairman
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- ROSS E. SAKAMURA, Esq.
- CLIFFORD S. JAMILE
Manager and Chief Engineer



June 26, 2001

HWY-DS
2.4084

Mr. Clifford S. Jamile
Page 2

If you have any questions, please contact Mr. Scott Urada, Project Manager, Technical Design Services Office, Design Branch, Highways Division at 692-7553.

Very truly yours,
Brian K. Minaa
BRIAN K. MINAAI
Director of Transportation

cc: DEP-J
SUrat ✓
HWY-DS ✓

Mr. Brian Minaa, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Minaa:

Subject: Proposed State Department of Transportation Kalaheo Highway Widening/Realignment (ID No. 0072F01), Olopana Golf Links to Waimanalo Beach Park

We request your assistance in determining the feasibility of incorporating Phase I of our proposed 36-inch water main with your Kalaheo Highway widening/realignment project (ID No. 0072F01).

We would like to install our main concurrently with your project under a utility agreement, to address American with Disabilities Act (ADA) requirements, minimize traffic impacts and costs. Phase I of our project, from Olopana Golf Links to Poalima Street, is within the highway widening/realignment project limit as shown on the attached scope of work map. The design for the waterline is in progress and construction can be funded to coincide with your project.

If feasible, the Board of Water Supply will pay for all costs associated with the design and construction of our new main. We previously submitted preliminary construction plans to your Department (ID No. 0-00-45) and our consultant, Mitsunaga & Associates, Inc., will continue to coordinate the plans with you.

If you have any questions, please contact Iris Oda at 527-5245.

Very truly yours,
Clifford S. Jamile
FOR CLIFFORD S. JAMILE
Manager and Chief Engineer

Attachment

Hawaiian Electric Company, Inc. - PO Box 2750 - Honolulu, HI 96840-0001
GEN-6 (EAE/IS)

WR-104/01

SEP 19 8 09 AM '01



Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96813

Attention: Mr. Gregory Lee

Subject: Kalaniana'ole Highway, 36-inch Water Main

Thank you for the opportunity to comment on your May 2001 Draft EA for the Kalaniana'ole Highway, 36-inch Water Main. We have reviewed the subject document and would like to mention that the proposed 5-foot minimum clearance from electrical poles (section 4.6) is inadequate. Please refer to HECO's Standard Construction Notes (attached).

Our point of contact for this project, and the originator of these comments, is Francis Hirakami (543-7536) principal engineer. I suggest your staff and consultants deal directly with Francis to coordinate HECO's continuing input on this project.

Sincerely,
Francis Hirakami

Kirk Tomita
Senior Environmental Scientist

cc: F. Hirakami
OEOC
Kimura International, Inc.



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HECO NOTES

1. Location of HECO Facilities

The location of HECO's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and are not guaranteed as shown. The Contractor shall verify in the field the locations of the facilities and shall exercise proper care in excavating and working in the area. The Contractor shall be responsible for any damages to HECO's facilities whether shown or not shown on the plans.

2. Compliance with Hawaii Occupational Safety and Health Laws

The Contractor shall comply with the State of Hawaii's Occupational Safety and Health laws and regulations, including without limitation, those related to working on or near exposed or energized electrical lines and equipment.

3. Excavation Permit

The Contractor shall obtain an excavation permit from HECO's Technical Division (543-5654) located at 820 Ward Avenue, 4th Floor, two weeks prior to starting construction. Please refer to our request number at that time.

4. Overhead Lines

State law requires that a worker and the longest object he or she may contact cannot come closer than a minimum radial clearance of 10 feet when working close to or under any overhead lines rated 50KV and below. For each additional 1KV above 50KV, an additional 0.4 inch shall be added to the 10-foot clearance requirement. The preceding information on line clearance requirements is provided as a convenience and it is the contractor's responsibility to be informed of and comply with any revisions or amendments to the law.

Should the Contractor anticipate that his work will result in the need to encroach within the minimum required clearance at any time, the Contractor shall notify HECO at least four (4) weeks prior to the planned encroachment so that, if feasible, the necessary protections (e.g. relocate, de-energize, or blanket HECO lines) can be put in place. HECO's cost of safeguarding its lines will be charged to the Contractor.

Contact HECO's Customer Installations Department at 543-7846 for assistance in identifying and safeguarding overhead power lines.

Refer to Section X of HECO's Electric Service Installation Manual for additional guidelines when working around HECO's facilities. A copy may be obtained from HECO's Customer Installations Department.

5. Pole Bracing

A minimum clearance of 10 feet must be maintained when excavating around utility poles and/or their anchor system to prevent weakening or pole support failure. Should work require excavating within 10 feet of a pole and/or its anchor system, the Contractor shall protect, support, secure, and take all other precautions to prevent damage to or leaning of these poles. The Contractor is responsible for all associated costs to brace, repair, or straighten poles. All means of structural support for the pole proposed by the Contractor shall first be reviewed by HECO before implementation. For pole bracing instructions, the Contractor shall call the HECO Construction

and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of two (2) weeks in advance.

6. Underground Lines

The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines. HECO's existing electrical cables in the area are energized and will remain energized during construction. Only HECO personnel are to handle these cables and erect temporary guards to protect these cables from damage. The cost of HECO's assistance in providing proper support and protection of its underground lines will be charged to the Contractor. The contractor shall exercise due care and precautions to avoid disturbing any energized cables and temporary guards and shall work cautiously at all times to avoid accidents.

For verification of underground lines or for assistance in providing proper support and protection of these lines, the Contractor shall call HECO's Construction & Maintenance Dept., Customer & System Superintendent, at 543-4223, a minimum of two (2) weeks in advance.

7. Excavations

When trench excavation is adjacent to or beneath HECO's existing structures or facilities, the Contractor is responsible for:

- a) Sheeting and bracing the excavation to prevent slides, cave-ins, and settlements.
- b) Protecting existing structures or facilities with beams, struts, or under-pinnings.
- c) Backfilling with proper backfill material including special thermal backfill where existing (refer to Engineering Department for thermal backfill specifications).

8. Relocation of HECO Facilities

Any work required to relocate or modify HECO facilities shall be done by HECO, or by the Contractor under HECO's supervision. The Contractor shall be responsible for all coordination, and shall provide necessary support for HECO's work, which may include, but not be limited to, excavation and backfill, permits and traffic control, and restoration of pavement, sidewalks, and other facilities.

All costs associated with any relocation or modification (either temporary or permanent) for the convenience of the Contractor, or to enable the Contractor to perform his work in a safe and expeditious manner in fulfilling his contract obligations shall be borne by the Contractor.

9. Conflicts

The Contractor acknowledges that HECO is not responsible for any delay or damage that may arise as a result of any conflicts discovered or identified with respect to the location or construction of HECO's electrical facilities in the field, regardless of whether the Contractor has met the requested minimum advance notices. In order to minimize any delay or impact arising from such conflicts, the Contractor shall notify HECO immediately upon discovery or identification of such conflict.

10. Damage to HECO facilities

The Contractor shall be responsible for the protection of all HECO surface and subsurface utilities and shall be responsible for any damages to HECO's facilities as a result of his operations. The Contractor shall immediately report such damages to HECO's trouble dispatcher at 546-7861.

Repair work shall be done by HECO or by the Contractor under HECO's supervision. Costs for damages to HECO's facilities shall be borne by the Contractor.

11. HECO Stand-By Personnel

The Contractor may request HECO to provide an inspector to stand-by during construction near HECO's facilities. The cost of such inspection will be charged to the Contractor.

The Contractor shall call the HECO Construction and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of 5 working days in advance to arrange for HECO stand-by personnel.

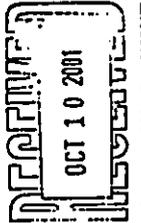
12. Indemnity

The Contractor shall indemnify, defend and hold harmless HECO from and against all losses, damages, claims, and actions, including but not limited to reasonable attorney's fees and costs based upon or arising out of damage to property or injuries to persons, or other tortious acts caused or contributed to by Contractor or anyone acting under its direction or control or on its behalf; provided Contractor's indemnity shall not be applicable to any liability based upon the sole negligence of HECO.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843



October 8, 2001



SEBASTIAN HARRIS, Mayor
EDDIE FLORES, Deputy Mayor
CHERYL ALLEN, Deputy Mayor
JANET Y. ALLEN, Deputy Mayor
KIMBERLY S. HANAUSS, Deputy Mayor
DORIS HARRIS, Deputy Mayor
BRIAN E. LINDAHL, E-Comm
ROSS E. SASAMURA, E-Comm
CLIFFORD S. JAMILE
Manager and Chief Engineer

Mr. Kirk Tomita
Senior Environmental Scientist
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840-0001

Attention: Francis Hirakami

Dear Mr. Tomita:

Subject: Your Letter of September 17, 2001 on the Draft Environmental Assessment for the Proposed Kalahele Highway 36-Inch Transmission Main, Koolauloko, Oahu

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

We have the following response to your comments:

1. We acknowledge that the 5-foot minimum clearance from electrical poles specified in Section 4.6 of the Draft EA is inadequate. The Final EA will be revised to reflect HECO's current Standard Construction Notes.
2. Future correspondence for this project will be coordinated directly with the principal engineer, Francis Hirakami.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,

Benny Utagawa
for CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: ✓ Glenn Kimura, Kimura International, Inc.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: FI-01-179

Nancy Nishikawa
Kimura International
1600 Kapiolani Blvd. Suite. 1610
Honolulu HI 96814

Re: Draft Environmental Assessment for Kalaniana'ole Highway 36-Inch Transmission Main,
Waimanalo to Olomana Golf Links, Phases 1 and 2, Waimanalo, Oahu

Dear Ms. Nishikawa:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (DEA) for the Kalaniana'ole Highway 36-Inch Transmission Main, Waimanalo to Olomana Golf Links, Phases 1 and 2. Kimula International, Inc. prepared the document on behalf of the City and County of Honolulu Board of Water Supply. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended; Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended; the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884] as amended, and other authorities mandating Service concern for environmental values.

The proposed project involves the installation of a 36-inch diameter domestic water transmission main from the town of Waimanalo northeast to Olomana Golf Links. Pipeline installation will be routed along 10,200 linear feet (approximately 2 miles) of Kalaniana'ole Highway, Poalua Street, Hihimanu Street, and Nonokio Street. Proposed plans call for the pipeline to be installed by saw-cutting and trenching of existing roadways, and the two proposed stream crossings will be accomplished by an open-cut method that will lay the 36-inch pipe below the stream channels.

General Comments

In general, the majority of this proposed project will be located in developed areas such as roadways and highway margins that are not considered important habitat for fish and wildlife

Nancy Nishikawa
Page 2

resources. The DEA adequately addresses these areas. However, the DEA does not adequately describe the environmental conditions nor address potential project effects on Waimanalo Stream and Kahawai Stream.

Specific Comments

Section 3.1.5. Hydrology - Surface Water

The DEA correctly reports that Waimanalo Stream is a perennial stream as described in the Hawaii Stream Assessment (HSA). The HSA is a broad-scale report that lists larger stream systems throughout the state. A limitation to the HSA is that it does not separately consider tributaries to streams, such as Kahawai Stream, which is a tributary to Waimanalo Stream. The term "perennial" refers to continuous surface water flow in the stream channel. The form and function of the Kahawai Stream channel, its vegetation characteristics, and Service familiarity with the Waimanalo watershed, provide ample justification to consider Kahawai Stream perennial. It is, therefore, incorrect to state that Kahawai Stream is not perennial on the basis that it is not listed by name in the HSA.

Section 3.2.1 Biological Environment - Flora

The botanical survey identified a variety of native plants on the banks of Kahawai Stream in the area where open-cut trenching is proposed for the purpose of laying the pipe under the stream channel. These include naio (*Myoporum laetifolium*), hala (*Pandanus tectorius*), and 'a'ali'i (*Dodonaea viscosa*), and ma'o (*Gossypium tomentosum*). These plants are part of a riparian vegetation restoration pilot project undertaken by the Waimanalo Health Center in cooperation with the University of Hawaii (UH) and Hawaii Department of Health (DOH). This restoration project receives funding from the Service's Coastal Program, a cooperative partnership that sponsors conservation and restoration of coastal and aquatic ecosystems. A considerable amount of monetary support, community volunteer labor, and youth conservation corps assistance has gone into establishing the native plants at that site. The Service recommends the applicant contact Waimanalo Water Quality Project Coordinator Lisa Ferrentinos (phone 783-7890, e-mail: lf@lava.net) to avoid develop measures to minimize potential project-related impacts to the restoration project site.

Section 3.2.2 Biological Environment - Fauna

Waimanalo and Kahawai Streams provide habitat for threatened and endangered waterbirds including: Hawaiian duck, *Anas wyvilliana*; Hawaiian coot, *Fulica alai*; and Hawaiian moorhen, *Gallinula chloropus sandvicensis*. The DEA provides photo-documentation showing the occurrence of koloa in the vicinity of the Kalaniana'ole Highway bridge over Kahawai Stream. In addition both Service and Waimanalo Water Quality Project personnel have observed Hawaiian moorhen in the same area. The occurrence of at least two endangered species at this site will require consultation under section 7 of the Endangered Species Act. Consultation proceeds with the initiation of a federal action or permit, in this case the Service anticipates that section 7

consultation will be done with the Department of the Army permit for dredge and fill activities as regulated under section 404 of the Clean Water Act. The DEA should recognize that ESA section 7 consultation will proceed in conjunction with the Corps permit application review process.

Section 3.2.3 Stream Fauna

The larger native stream fauna of Hawaii include nine species of fish and invertebrates that are migratory and, as part of their life history, require free-flowing streams with good water quality for access to and from the marine environment. All of these species are uncommon or rare on Oahu, and all of the native aquatic fauna are sensitive to both short-term construction impacts and long-term changes in hydrologic function of the streams they inhabit. The DOH study cited in the DEA found that four of the nine larger native stream organisms occur in Waimanalo Stream. Despite the fact that non-native species are also found in considerable numbers in aquatic habitats of the Waimanalo watershed, the DOH study indicates that stream habitat and water quality conditions at least partially support a community of native aquatic organisms. The Service recommends that impacts to the stream environments be avoided or minimized to the extent practicable.

Section 4.1.5 Potential Impacts and Mitigation Measures - Hydrology and Water Quality - Surface Water

The DOH stream ecology study and the physical-chemical study undertaken by UH researcher Eric DeCarlo were performed as a part of a watershed-wide pollution identification and control process called the Total Maximum Daily Load (TMDL) program. Because the TMDL program specifically addresses issues of short- and long-term water quality degradation in the Waimanalo Watershed, the DEA should describe how anticipated project impacts will be evaluated with respect to other water quality improvement efforts that are part of the TMDL program.

Section 5.4 Possible Alternatives - Alternative Stream Crossing Alignment

Alternatives to the open-cut trenching method exist. Both directional drilling and micro-tunneling appear to pose significantly less potential impacts to the aquatic environment because they avoid or minimize disturbance to stream water and the stream channel itself. However, they were not selected based on "engineering and economic analysis of the alternatives." There is no specific description of this analysis nor is there supporting documentation for this analysis in the DEA. A more thorough description of the factors leading to the decision to propose open-cut trenching should be included in the DEA. This discussion should take in to account effects to aquatic organisms, endangered waterbirds and their habitats.

Concluding comments

Based on the information provided to us in the DEA for the proposed project, and in conjunction with standard Best Management Practices (BMPs) and other conservation measures normally

required by permitting agencies for projects such as this, the Service recommends that the following measures also be incorporated into the project to minimize impacts to aquatic and riparian resources:

- 1) all project-related materials should be placed or stored in ways to avoid or minimize disturbance to the aquatic environment;
- 2) all project-related material should be free of pollutants;
- 3) no contamination of the aquatic environment (trash, debris disposal, etc.) should result from project activities;
- 4) a contingency plan to control accidental spills of petroleum products should be developed. Absorbent and containment booms should be stored on-site to facilitate the clean-up of petroleum spills;
- 5) turbidity and siltation from excavation activities should be minimized and contained to the immediate vicinity of excavation through the use of silt containment devices and the curtailment of excavation during adverse weather conditions; and
- 6) removal of riparian vegetation should be avoided or minimized.

The Service appreciates the opportunity to provide comments on the proposed project. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Gordon Smith at 808/541-3441.

Sincerely,



Paul Henson
Field Supervisor
Ecological Services

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96813



March 7, 2002

JEREMY WARDEN, Manager
COPY
EDDIE FLORES, JR., Director
CHARLES A. STEEL, Vice-Chief Engineer
GARY L. JAMES, Chief Engineer
KAREN M. KALOUZAKI, SR., Chief Engineer
SARAHARA KIM STANTON, Chief Engineer
BRUNO K. MAMALA, Esq., Chief Counsel
ROSS S. SAJIJARA, Esq., Chief Counsel
CLIFFORD S. JULIE, Chief Engineer
Manager and Chief Engineer

Mr. Paul Henson
March 7, 2002
Page 2

Mr. Paul Henson, Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
P. O. Box 50088
Honolulu, Hawaii 96850

Dear Mr. Henson:

Subject: Your Letter of October 3, 2001 on the Draft Environmental Assessment for the Proposed Kalahele Highway 36-Inch Transmission Main, Koolaupeke, Oahu

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed transmission main project.

We provide the following response to your concerns:

1. Section 3.1.5. Hydrology - Surface Water
The Final EA will indicate that according to the U.S. Fish and Wildlife Service, the form and function of the Kahawai Stream Channel, its vegetation characteristics and service familiarity with the Waimanalo watershed provide ample justification to consider Kahawai Stream as perennial.
2. Section 3.2.1. Biological Environment - Flora
The roadway corridor will be restored to its pre-construction conditions. A biological survey conducted in August 2000 identified native plants along the northwest side of Kahawai Stream. Since then, the stream restoration project has expanded with native plants now lining both banks and the adjacent service road for a distance of more than 500 feet. In the case of native plants identified in the biological survey, temporary transplantation or replotting is among the mitigation measures being considered. The irrigation system will be temporarily relocated as well. We will contact Frank Kawakapukalani Hewett of the Waimanalo Water Quality Project and inform Ms. Lisa Ferrminos to coordinate and develop acceptable measures to minimize potential project-related impacts to the restoration project site.

3. Section 3.2.2. Biological Environment - Fauna

We acknowledge the need for further consultation regarding habitat for threatened and endangered water birds and anticipate its occurrence during the Army Corps of Engineers' permit application review process for dredge and fill activities as regulated under Section 404 of the Clean Water Act.

We understand that the 'alae' ula can nest year-round with the prime season from March through August and will monitor for nesting activities prior to construction. Phasing the project is a potential mitigation measure in order to avoid the endangered species during the prime nesting season. The matter will be examined further during consultation required by Section 7 of the Endangered Species Act.

Endangered Species Act, Section 7 Review will be added to the list of permits required or potentially required by the project.

4. Section 3.2.3. Stream Fauna

The project is being planned and designed to avoid or minimize impacts to stream fauna and the stream environment to the extent practicable. The two stream crossings will be phased so that at any given time, no more than half the stream will be blocked, allowing the free movement of existing aquatic species. During in-stream work, the construction area will be isolated by sheet piles or steel plate coffer dams and mitsuy silt curtains to contain the excavated material to protect the aquatic ecosystem. Construction will also be conducted during the drier periods when stream flow is low. The stream crossing permits will specify the construction method, pollution control measures and project scheduling.

5. Section 4.1.5. Potential Impacts and Mitigation Measures - Hydrology and Water Quality - Surface Water

Best Management Practices (BMPs) and a water quality monitoring plan will be developed for the stream crossing work. The water quality monitoring plan will ensure the adequacy of the implemented BMPs as described in Item No.7. Water sampling will be performed before construction begins to define the water quality baseline prior to construction, during construction activities, and after construction is completed. This effort will be coordinated with the Total Maximum Daily Load program.

Mr. Paul Henson
March 7, 2002
Page 3

6. Section 5.4. Possible Alternatives

The Alternative Stream Crossing Methods Section of the Final EA will be expanded to provide a more thorough discussion of the factors leading to the preferred open-cut trenching method.

Alternative methods such as micro tunneling (MT) and horizontal directional drilling (HDD) were considered as a possible stream crossing method. MT requires the excavation of pits at either end of the tunnel. The minimum area required at the MT jacking pit locations is approximately 30 feet by 15 feet in plan and 20 feet in depth. Approximately 18,000 cubic feet of material would be excavated from the 2 pits. HDD requires an entry and exit location. The pilot-hole entry point and large drill rig requires a minimum area of 60 feet by 150 feet. Mobilization cost is high because the large rig would be transported from the mainland. The exit area requires enough space to lay the entire length of pipe to "pull back" through the enlarged hole. Private homes are located right next to the Waimanalo Stream leaving no space to physically excavate the pits. The same is true on the west side of Kahawai Stream where the Weimberg Villages housing is located. The stream crossings are shown on the enclosed photos. Given the relatively narrow streams to be crossed, construction using the open-trench method is expected to take two weeks, almost equal to the length of time it will take to set up and dismantle the tunneling equipment. Overall, construction is expected to be longer with MT and HDD. Based on the longer period of construction and collateral impacts generated by MT and HDD, we believe the open-trench method will be less stressful on the stream environment, especially in light of mitigation measures to manage and minimize anticipated adverse affects.

7. Your recommended list of management practices and conservation measures to minimize impacts to aquatic and riparian resources will be incorporated into the Final EA.

If you have any questions, please contact Scot Muraoka at 527-5221.

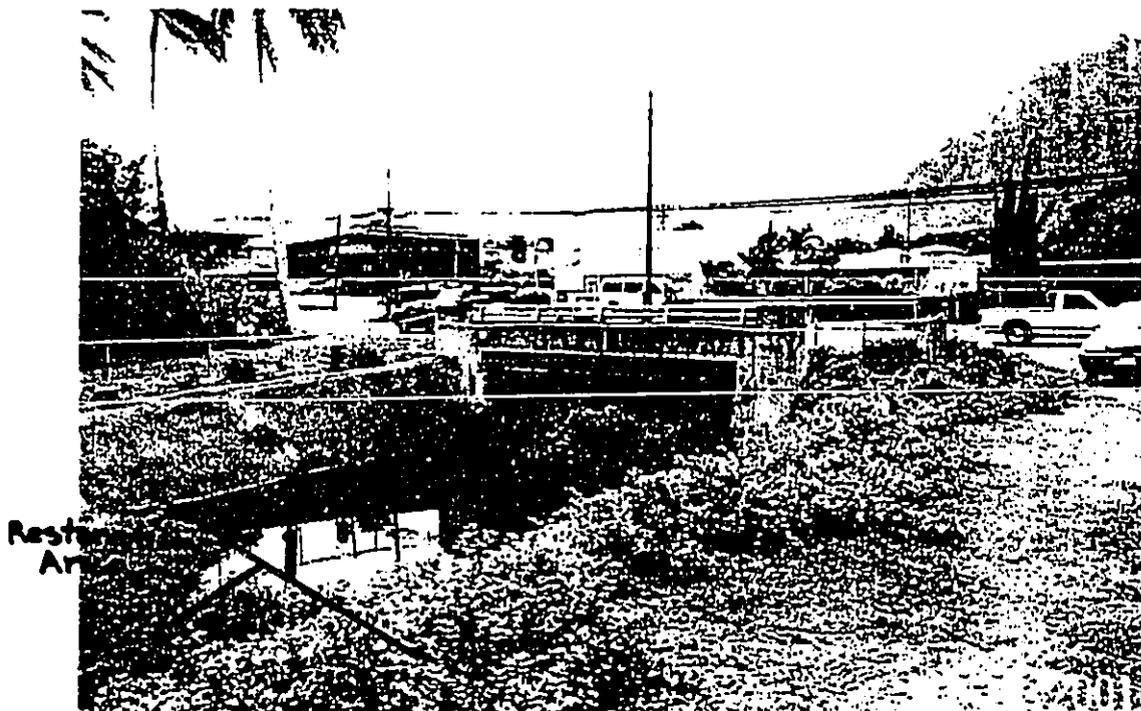
Very truly yours,

Benny Uegason

for CLIFFORD S. JAMILE
Manager and Chief Engineer

Enclosures

cc Nancy Nishikawa, Kimura International, Inc
Frank Kawakapuokalani Hewett
Ms. Lisa Ferentinos



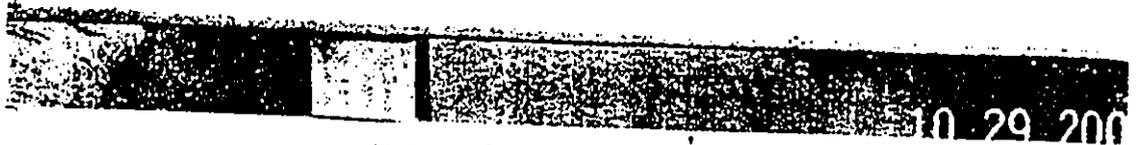
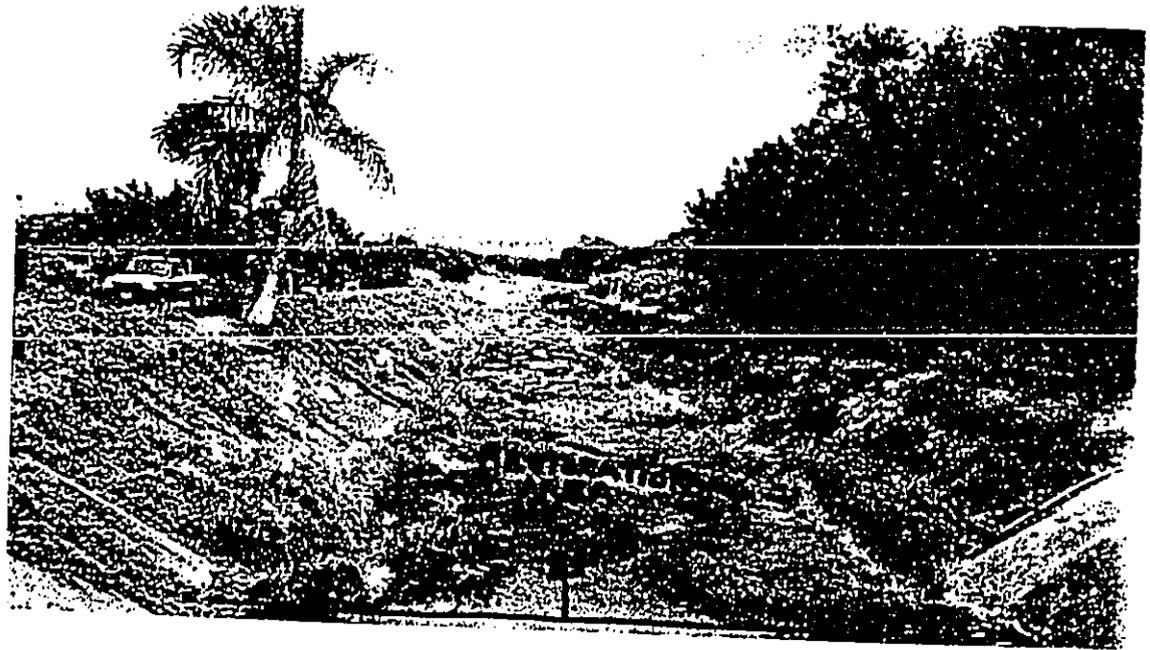
Rest
Area

Kahawai Stream Crossing

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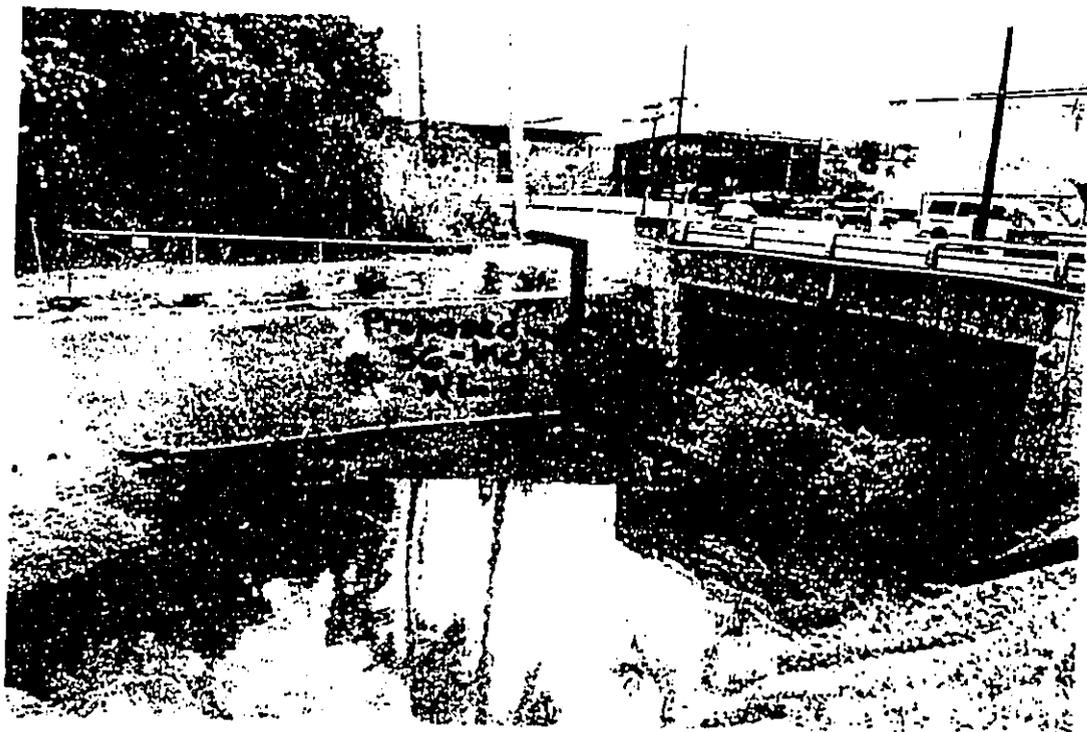
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Title: 03 11 34



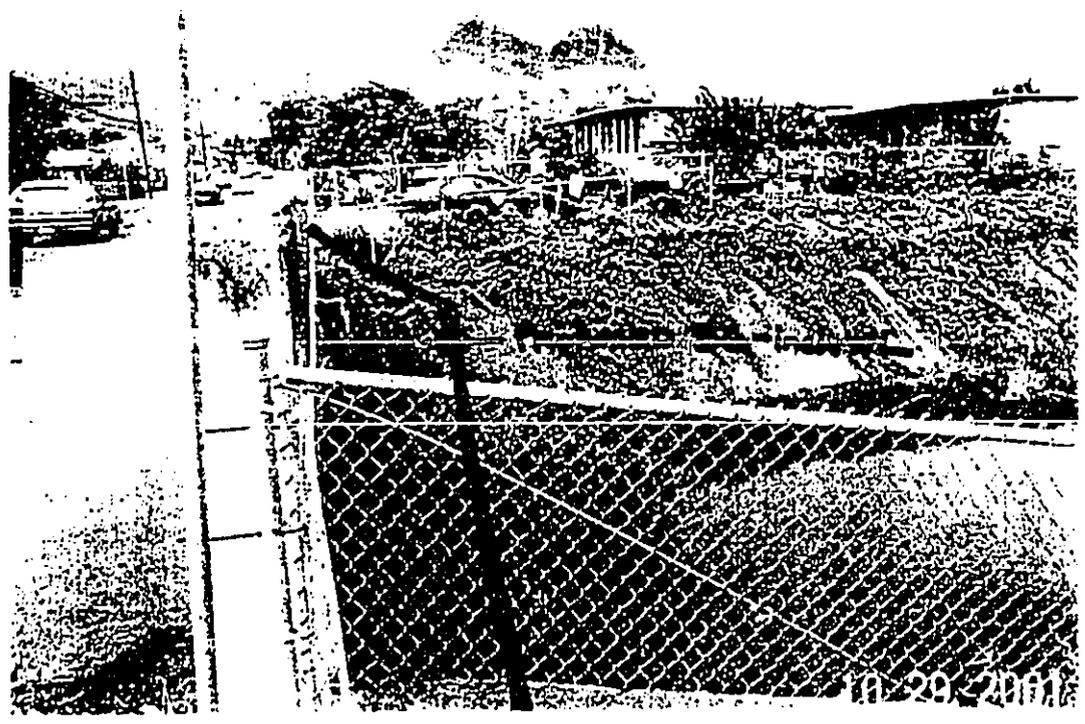
Kahawai Stream Crossing

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Kahawai Stream Crossing

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Kahawai Stream Crossing

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Date: 10/31/01

Time: 03:34:31 PM



Waimanalo Stream Crossing

file: C:\WINNT\Profiles\pe_sco\Temporary Internet Files\OLK5F\DCP_0130.JPG

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Time : 03:36:16 PM

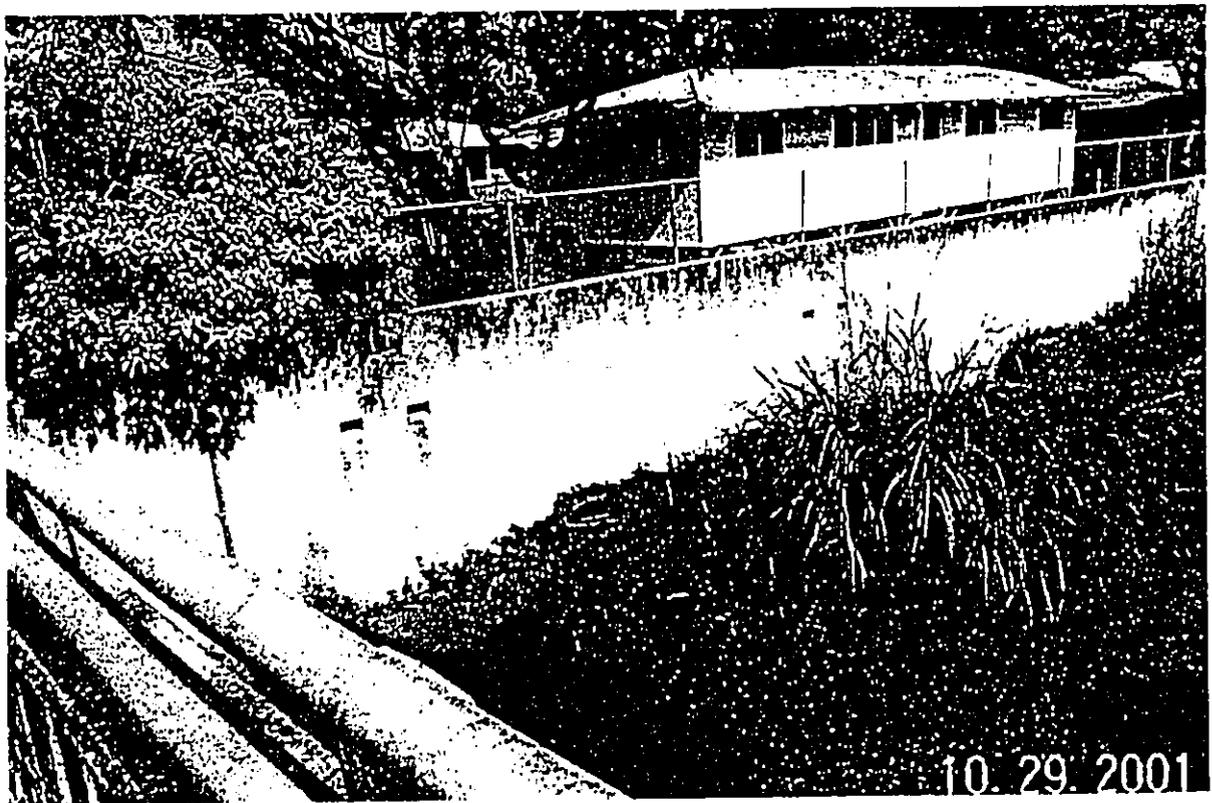


Waimanalo Stream Crossing

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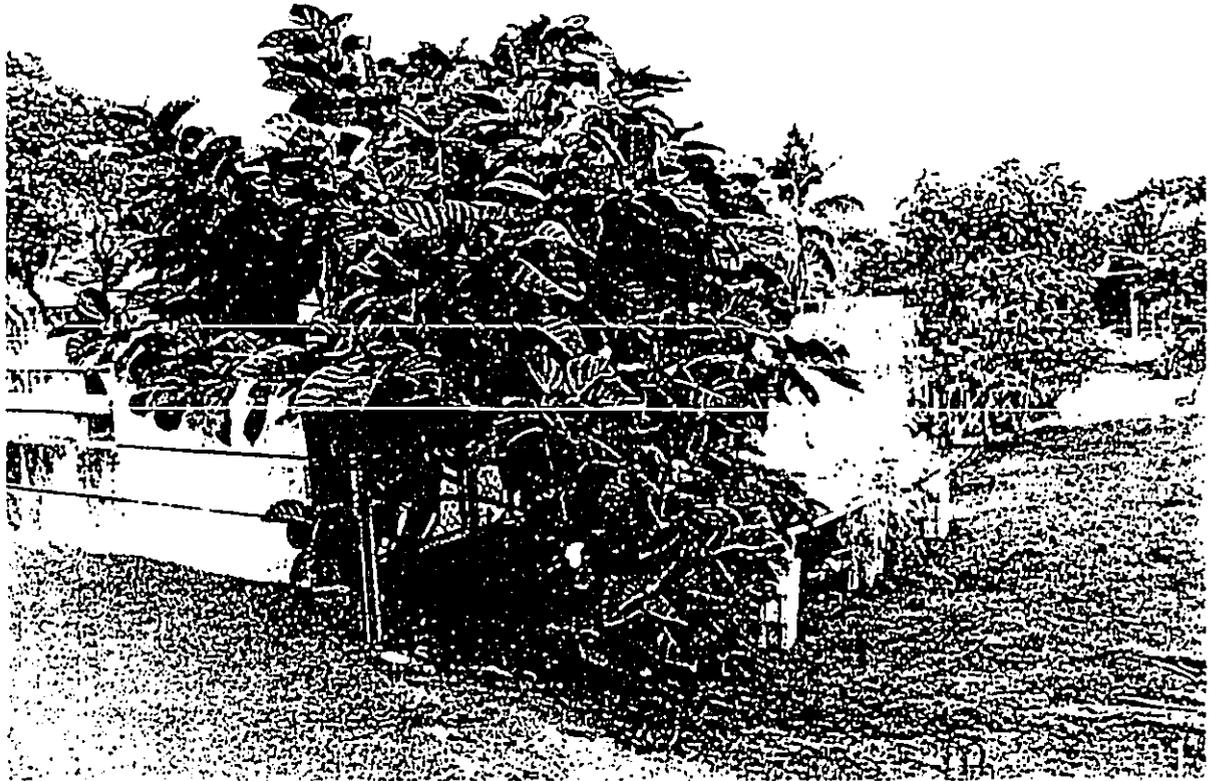


Waimanalo Stream Crossing

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Waimanalo Stream Crossing

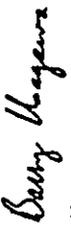
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Ms. Lisa Ferrininos
April 4, 2002
Page 2

5. We plan to combine Phase I of our project from Olomana Golf Course to Poalima Street with the State Department of Transportation's Kalahele Highway Widening/Realignment project to minimize traffic impacts and cost. Construction is anticipated to begin in 2004. Construction of Phase II of the project along Hihimanui Street from Kalahele Highway to Nonokio Street is anticipated to begin in 2005.

If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,


for CLIFFORDS. JAMILE
Manager and Chief Engineer

Enclosure

cc: Frank Kawaiapuokalani Hewitt

BURK

cc: Maintenance - Engineering
S. Muraoka

WR-176/01

11/09/01 15:10 FAX 5278195

BWS ENGINEERING

001

WR-176/01

941-5177

**Waimanalo Watershed Project
Center for Conservation Research and Training**

University of Hawaii
Waimanalo Office
41-041 Himalea St.
Waimanalo, HI 96795
Phone 808-783-7890
Fax 808-259-5376

October 9, 2001

Francis Fung
Board of Water Supply
630 S. Beretania St.
Honolulu, HI 96843

RE: Kalaheua'ole Highway 36" Water Main/Crossing at Kahawai Stream, Waimanalo

Dear Mr. Fung:

Over the past two years our project has installed a native plant stream bank restoration site on the makai side of Kalaheua'ole Highway at Kahawai Stream, immediately adjacent to the highway bridge. We have funding from the state Dept. of Health's Polluted Runoff Control Program and the U.S. Fish and Wildlife Service. We would like to know whether the BWS plan to bury the pipeline under the streambed will impact our planting area. If so, we would like to be informed of the project timeline so that we can remove any salvageable plants and replace them after the project is finished. A lot of expense and community volunteer time has gone into improving this area.

You should also be aware that there are a pair of endangered Hawaiian waterbirds called 'o'o or 'o'o, or Hawaiian gallinule, that are living just makai of the bridge. Care will need to be taken to not disturb them or their nest (if work is done during the nesting season).

Thank you for your attention to this matter. We look forward to your response.

Sincerely,



Lisa Ferentinos
Waimanalo Watershed Coordinator

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
830 SOUTH BERTANIA STREET
HONOLULU, HI 96843



April 4, 2002

JOSEPH WARDEN Mayor

EDDIE FLORES JR. Chairman
CHARLES A. STEWART, Vice-Chairman
JAMES H. HANAUER, III
ROBERT J. SLOAN, III
BARBARA KIM STANTON
SPAWN K. BARNAL, Esq. - Other
ROSS B. SUGAMURA, Esq. - Other
CLIFFORD S. JAVILE
Manager and Chief Engineer

Ms. Lisa Ferentinos
Waimanalo Watershed Project
41-041 Himalea Street
Waimanalo, Hawaii 96795

Dear Ms. Ferentinos:

Subject: Your Letter of October 9, 2001 Regarding the Board of Water Supply's
36-inch Water Main Crossing at Kahawai Stream, Waimanalo, Oahu

Thank you for your letter informing us of your native plant Kahawai stream bank restoration project. We have the following comments and mitigation:

1. We plan to install the pipeline crossing underground and will impact a portion of the stream banks. We will inform you of the contractor's schedule so that the salvageable plants can be temporarily removed and replaced. The irrigation line will also require temporary respiping.
2. A revegetation plan will be developed to ensure the impacts to the restoration project are minimized and the banks are restored close to their original condition.
3. We may downsize the pipeline diameter, which will reduce the impacted area significantly.
4. We will address the presence of the 'o'o, Hawaiian Gallinule makai of the bridge when we submit the Department of Army permit. If construction is done during nesting, phasing the project is a potential mitigation measure in order to avoid the endangered species. The U.S. Fish and Wildlife Service has provided initial comments on the issue of potential impacts on threatened and endangered waterbirds and their habitats. The matter will be examined further during consultation required by Section 7 of the Endangered Species Act. This consultation will occur as part of the review process for the U.S. Corps of Engineers permit for dredge and fill activities regulated under Section 404 of the Clean Water Act. We will contact the Waimanalo Watershed Project to develop impacts to the restoration project.

Pure Water... our greatest need - now if ever!

2001 OCT 12 11:18

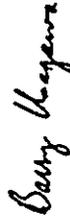
Oct 15 9 25 AM '01
Water Resources

Mr. Lisa Ferralinos
April 4, 2002
Page 2

5. We plan to combine Phase I of our project from Olomana Golf Course to Poelima Street with the State Department of Transportation's Kalaheo Highway Widening/Realignment project to minimize traffic impacts and cost. Construction is anticipated to begin in 2004. Construction of Phase II of the project along Hibinani Street from Kalaheo Highway to Nonoko Street is anticipated to begin in 2005.

If you have any questions, please contact Scott Minnola at 327-5221.

Very truly yours,



for CLIFFORD S. JAMILE
Manager and Chief Engineer

Enclosure

cc: Frank Kawakapualani Hewitt

Burrk

cc: Maintenance - Engineering
S. Huraoka

NR-176/01

APPENDIX A

Appendix A

**Environmental Noise Assessment Study
D. L. Adams Associates, Ltd.
September 28, 2000**



D. L. ADAMS ASSOCIATES, LTD.

ACOUSTICAL CONSULTANTS

Project No. 00-23

ENVIRONMENTAL NOISE ASSESSMENT STUDY
BWS KALANIANA'OLE HIGHWAY 36-INCH WATERMAIN
WAIMANALO, OAHU, HAWAII

September 28, 2000

Prepared for
Kimura International.
Honolulu, Hawaii

PALI PALMS PLAZA • 970 NO. KALAHEO AVENUE • SUITE A-311
KAILUA, HAWAII 96734 • (808) 254-3318 • FAX (808) 254-5295
E-MAIL: hawaii@dtaa.com

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2.0	Project Description	1
3.0	Noise Standards	1
4.0	Existing Acoustical Environment	3
5.0	Potential Noise Impact Due to the Project and Noise Mitigation	3
	References	6
	Appendix A Acoustical Terminology	
<u>Figure</u>		
1,1A	Project Location and Study Area	
2	Maximum Permissible Sound Levels for Various Zoning Districts	
3,3A	Locations of Noise Measurements	
4	Typical Sound Pressure Levels from Construction Equipment	

1.0 SUMMARY

- 1.1** The proposed project involves the construction of a 36-inch waterline in Waimanalo, from the vicinity of Olomana Golf Course to the intersection of Hihimanu Street and Nonokio Street. The construction of the waterline will involve excavation, backfill, grading, paving, and other construction operations on or Kalaniana'ole Highway and other streets in Waimanalo.
- 1.2** The project area is currently exposed to daytime ambient noise levels of 46 to 69 dBA with the dominant noise sources being traffic.
- 1.3** Existing noise sensitive areas include residential areas and churches on the roadways surrounding the project site.
- 1.4** The dominant noise sources during project construction will probably be backhoes, bulldozers, graders, and diesel powered trucks. The noise from construction activities will impact nearby residences. Noise from construction activities should be short term and must comply with State Department of Health noise regulations. To reduce the noise impact of construction activities, all work should be conducted during daytime hours.
- 1.5** Traffic will increase along Mekia Street, Lukanela Street, and Poalima street during the times when traffic is detoured from Kalaniana'ole Highway. The increase in traffic may impact local residences. These impacts will be short term and should be during daytime hours only.
- 1.6** Following the completion of the project, noise levels are expected to return to existing levels.

2.0 PROJECT DESCRIPTION

The project involves the construction of a 36-inch waterline in Waimanalo, from the vicinity of Olomana Golf Course to the intersection of Hihimanu Street and Nonokio Street as shown in Figures 1 and 1A. The construction of the waterline will involve excavation, backfill, grading, paving and other construction operations on or near Kalaniana'ole Highway and other streets in Waimanalo.

3.0 NOISE STANDARDS

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and set noise limits as a function of land use. A brief description of common acoustic terminology used in these guidelines and standards is presented in Appendix A.

3.1 State Department of Health (DOH)

The DOH defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to stationary noise sources such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc., and equipment related agricultural, construction, and industrial activities [Reference 1]. These levels are enforced for any location at or beyond the property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits which apply are a function of the zoning and time of day as shown in Figure 2. With respect to mixed zoning districts, DOH specifies the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level.

The DOH defines a heavy vehicle as a vehicle which has a manufacturer's gross vehicular weight rating of ten thousand pounds or greater. Such vehicles shall not be operated on any trafficway in such a manner that it emits noise in excess of the limits specified in Reference 2. If these limits will be exceeded, a permit from the DOH director is required.

3.2 U.S. Environmental Protection Agency (EPA)

The U.S. EPA has identified a range of yearly day-night equivalent sound levels, L_{dn} , sufficient to protect public health and welfare from the effects of environmental noise [Reference 4]. The EPA has established a goal to reduce exterior environmental noise to an L_{dn} not exceeding 65 dBA and a future goal to

further reduce exterior environmental noise to an L_{dn} not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather they are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

3.3 U.S. Federal Highway Administration (FHWA)

The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, L_{eq} , for traffic noise exposure [Reference 5]. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior L_{eq} of 67dBA and a maximum interior L_{eq} of 52 dBA. These limits are viewed as design goals, and all projects meeting these limits are deemed in conformance with FHWA noise standards.

The State HDOT has adopted FHWA's design goals for traffic noise exposure in

its noise analysis and abatement policy [Reference 6]. According to the policy, a traffic noise impact occurs when the predicted traffic noise levels "approach" or exceed FHWA's design goals or when the predicted traffic noise levels "substantially exceed the existing noise levels." The policy also states that "approach" means at least 1 dB less than FHWA's design goals and "substantially exceed the existing noise levels" means an increase of at least 15dB.

4.0 EXISTING ACOUSTICAL ENVIRONMENT

Twenty-four hour noise level measurements were conducted to assess the existing acoustical environment along the roadways of the project. The measurements were obtained at Locations 1 through 3 as shown in Figures 4 and 4A, using a Larson-Davis Laboratories, Model 700 Sound Level Meter. The following results expressed in terms of equivalent sound levels, L_{eq} , and in units of A-weighted decibels were obtained.

Measurement Location	Date of Measurement	Minimum Nighttime Hourly L_{eq} (in dBA)	Minimum Daytime Hourly L_{eq} (in dBA)
1	6/26-6/27	51.0	60.0
2	6/27-6/28	54.0	60.5
3	7/6-7/7	46.0	51.0

The dominant noise source observed during these measurements was traffic.

5.0 POTENTIAL NOISE IMPACT DUE TO THE PROJECT AND NOISE MITIGATION

5.1 Project Construction Noise

Project construction will involve excavation, grading, paving, and movement of construction vehicles. The various construction activities may generate significant amounts of noise, which may impact nearby residential areas. The actual noise levels produced will be a function of the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 5. Earthmoving equipment, e.g., backhoes, front loaders, bulldozers and diesel-powered trucks, will probably be the loudest equipment used during construction. DOH's maximum permissible noise levels for construction equipment during nighttime hours in residential areas is 45 dBA and 55 dBA during daytime hours or the ambient noise level whichever is higher. Thus, noise levels at residences along Kalaniana'ole Highway during nighttime hours must be below 51 dBA and noise levels at residences along Poalima Street and Hihimanu Street must be below 46 dBA. Along Kalaniana'ole Highway,

earthmoving equipment within 4000 feet of residential areas and in a direct line of sight will produce noise levels in excess of the maximum permissible nighttime sound levels. Along Poalima and Hihimanu Streets, earthmoving equipment within 8000 feet of residential areas and in a direct line of sight will produce noise levels in excess of the maximum permissible nighttime sound levels. In addition, daytime noise levels along these streets will be in excess of DOH noise regulations if they are conducted within 1600 feet of residences along Kalaniana'ole Highway and within 4000 feet of residences along Poalima and Hihimanu streets.

In cases where construction noise exceeds, or is expected to exceed the DOH's "maximum permissible" property line noise levels [Reference 1], a permit must be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc., which emit noise levels in excess of "maximum permissible" levels. Specific permit restrictions for construction activities are:

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 9:00 a.m. and after 6:00 p.m. on Saturday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays."

In addition, construction equipment and on-site vehicles or devices whose operations involve the exhausting of gas or air, excluding pile hammers and pneumatic hand tools weighing less than 15 pounds, must be equipped with mufflers, and construction vehicles using trafficways must satisfy the DOH's vehicular noise requirements [Reference 2].

5.2 Project Generated Traffic Noise

During some portions of the project, vehicles will be detoured from Kalaniana'ole Highway onto Mekia Street, Lukanela Street, and Poalima Street. These detoured vehicles will increase the traffic volume and thus, traffic noise levels will increase. It is expected that the detours will only be in place during construction hours, e.g., 7 a.m. to 6 p.m. However, the duration of these detours, the times of the detours, and the number of detoured vehicles is not available. Although not

directly applicable to this project, the noise levels along the detour streets may exceed FHWA and State DOT highway noise goals (67 dBA) during peak traffic periods. These noise levels due to detoured vehicles will be short term and will occur only during detour periods.

REFERENCES:

1. Chapter 46, *Community Noise Control*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 23, 1996.
2. Chapter 42, *Vehicular Noise Control for Oahu*, Department of Health, State of Hawaii, Administrative Rules, Title 11, November 6, 1981.
3. *Section 3.11 Noise Regulations*, Land Use Ordinance, City and County of Honolulu, Oahu, October 22, 1986.
4. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.
5. *Department of Transportation, Federal highway Administration Procedures for Abatement of Highway traffic Noise*, Title 23, CFR, Chapter 1, Subchapter J, Part 772, 38 FR 15953, June 19, 1973; Revised at 47 FR 29654, July 8, 1982.
6. *Noise Analysis and Abatement Policy*, Department of Transportation, Highways Division, State of Hawaii, June 1997.

APPENDIX A

ACOUSTICAL TERMINOLOGY

Sound Pressure Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. It is measured in terms of decibels (dB) using precision instruments known as sound level meters. Noise is defined as "unwanted" sound.

Technically, sound pressure level (SPL) is defined as:

$$\text{SPL} = 20 \log (P/P_{\text{ref}}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and P_{ref} is the reference pressure, 20 micropascals, which is approximately the lowest sound pressure that can be detected by the human ear. For example, if P is 20 micropascals, then SPL = 0 dB, or if P is 200 micropascals, then SPL = 20 dB. The relation between sound pressure in micropascals and sound pressure level in decibels (dB) is shown in Figure A-1.

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound levels, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined level of 53 dB, not 100 dB; two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of a sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 5 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

The human ear is more sensitive to sound in the frequency range of 250 Hertz (Hz) and higher, than in frequencies below 250 Hz. Due to this type of frequency response, a frequency weighting system, was developed to emulate the frequency response of the human ear. This system expresses sound levels in units of A-weighted decibels (dBA). A-weighted sound levels de-emphasizes the low frequency portion of the spectrum of a signal. The A-weighted level of a sound is a good measure of the loudness of that sound. Different sounds having the same A-weighted sound level are perceived as being about equally loud. Typical values of the A-weighted sound level of various noise sources are shown in Figure A-1.

Appendix A Acoustical Terminology (Continued)

Statistical Sound Levels

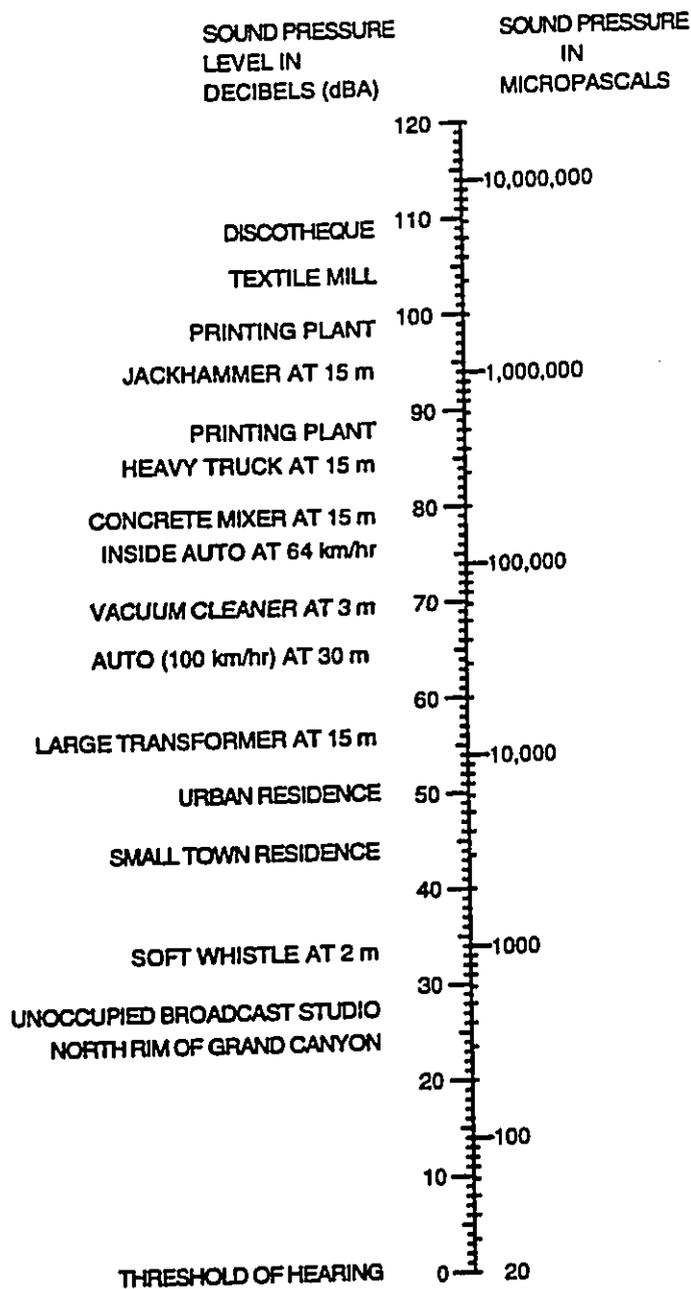
The sound levels of long-term noise producing activities, such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, a statistically-based method of expressing sound or noise levels developed. It is known as the Exceedence Level, L_n . The Exceedence Level, L_n , represents the sound level which is exceeded for $n\%$ of the measurement time period. For example, $L_{10} = 60$ dBA indicates that for the duration at the measurement period, the sound level exceeded 60 dBA 10% of the time. Commonly used Exceedence Levels include L_1 , L_{10} , L_{50} , and L_{90} , which are widely used to assess community and environmental noise. Figure A-2 illustrates the relationship between selected statistical noise levels.

Equivalent Sound Level

The Equivalent Sound Level, L_{eq} , represents a constant level of sound having the same total acoustic energy as that contained in the actual time-varying sound being measured over a specific time period. L_{eq} is commonly used to describe community noise, traffic noise, and hearing damage potential. It has units of dBA and is illustrated in Figure A-2.

Day-Night Equivalent Sound Level

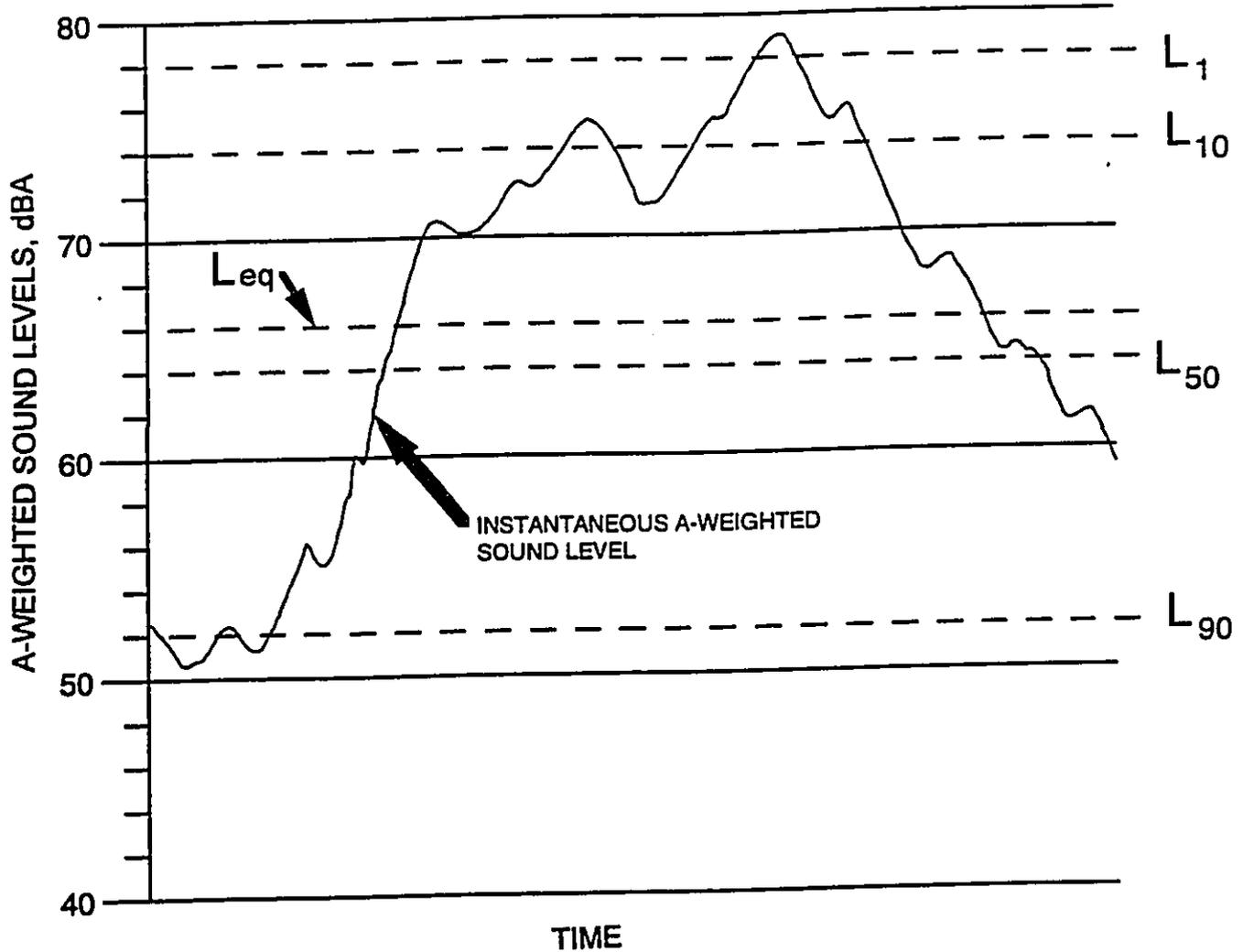
The Day-Night Equivalent Sound Level, L_{dn} , is the Equivalent Sound Level, L_{eq} , measured over a 24-hour period. However, a 10 dB penalty is added to the noise levels recorded between 10 pm and 7 am to account for people's higher sensitivity to noise at night when the background noise level is typically lower. The L_{dn} is a commonly used noise descriptor in assessing land use compatibility, and is widely used by federal and local agencies and standards organizations. Qualitative descriptions, as well as local examples of L_{dn} , are shown in Figure A-3.



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 dba
 DARBY & ASSOCIATES
 ACOUSTICAL CONSULTANTS

970 N. KALAHEO AVENUE, SUITE A-311, KAILUA, HAWAII 96734
 (808)254-3318 FAX: (808)254-5295 EMAIL: hawaii@dlaa.com

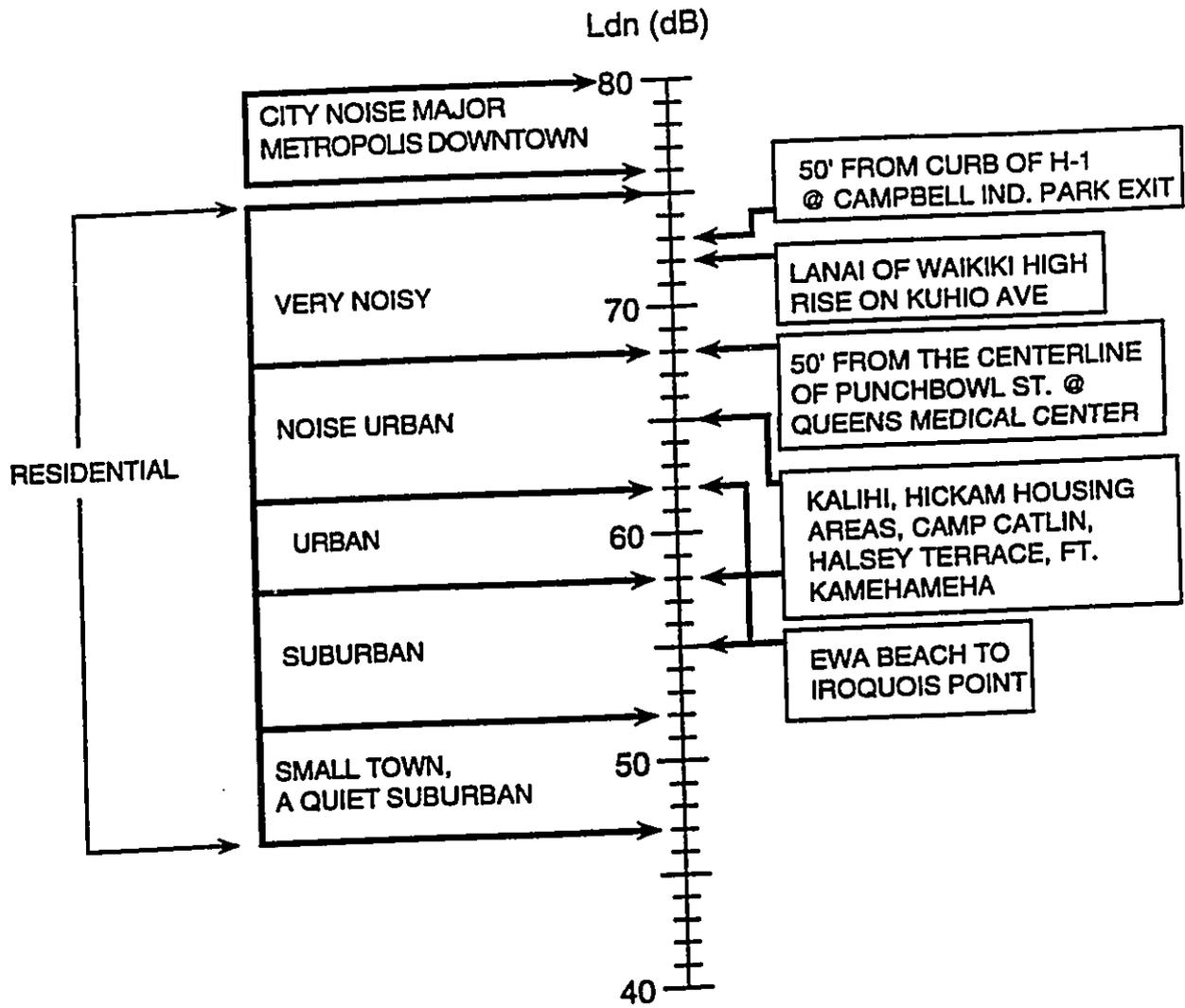
FIGURE A-1 - THE RELATION BETWEEN SOUND PRESSURE, P, AND SOUND PRESSURE LEVEL SPL. ALSO SHOWN ARE TYPICAL VALUES OF A-WEIGHTED SOUND LEVELS OF VARIOUS NOISE SOURCES.



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FIGURE A-2 - COMPARISON OF AN INSTANTANEOUS SOUND LEVEL AND THE CORRESPONDING STATISTICAL SOUND LEVELS



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FIGURE A-3 - QUALITATIVE DESCRIPTION OF THE DAY-NIGHT EQUIVALENT SOUND LEVELS (Ldn) AND EXAMPLE Ldn's AT SELECTED LOCATIONS ON OAHU

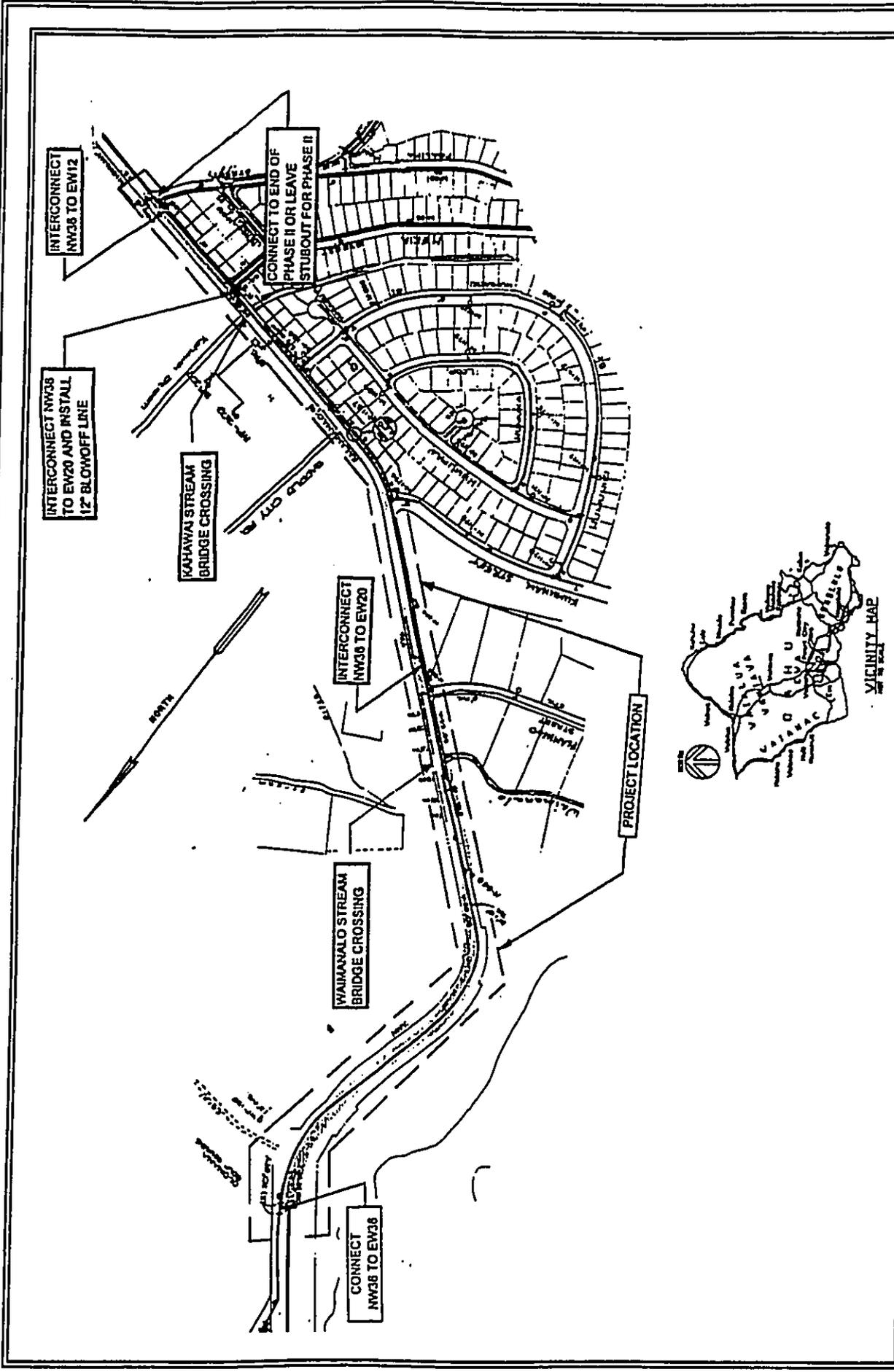
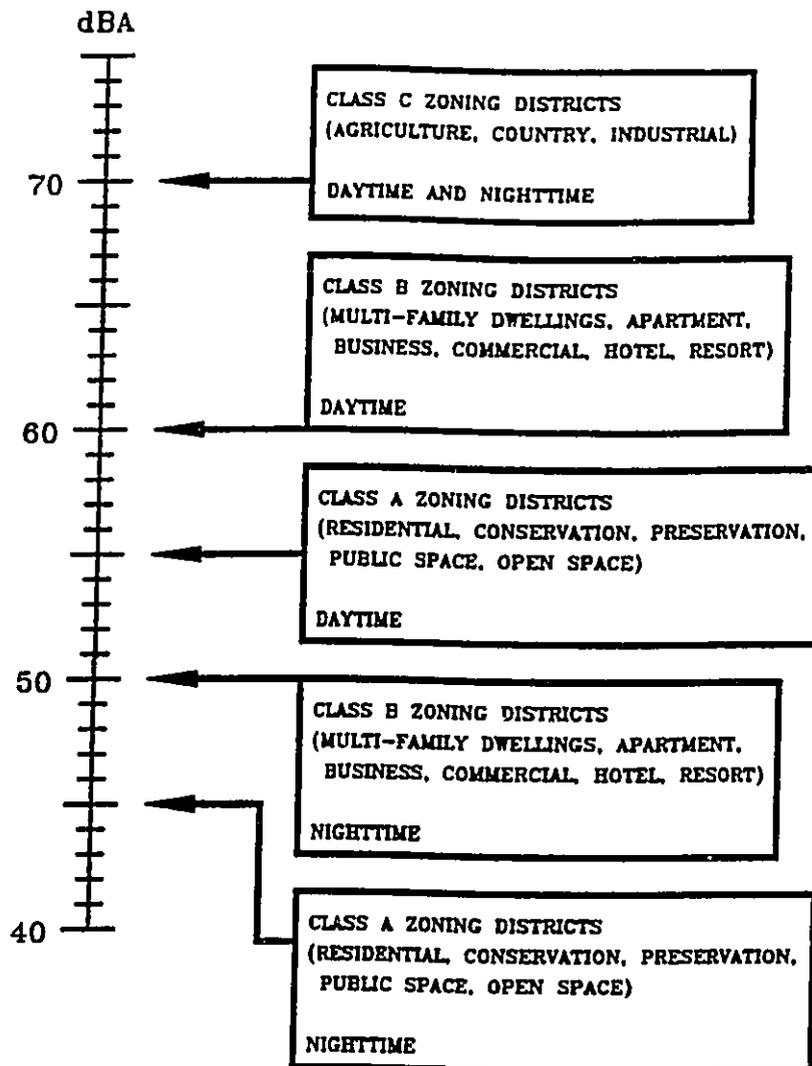


FIGURE 1 - PROJECT LOCATION AND STUDY AREA


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NOTE: SOUND LEVELS INDICATED BY ZONING DISTRICT ARE THE "MAXIMUM PERMISSIBLE" SOUND LEVELS DUE TO EXCESSIVE NOISE SOURCES SUCH AS STATIONARY MECHANICAL EQUIPMENT AND EQUIPMENT RELATED TO AGRICULTURAL CONSTRUCTION AND INDUSTRIAL ACTIVITIES THAT SHALL NOT BE EXCEEDED FOR MORE THAN 10% OF THE TIME WITHIN ANY 20-MINUTE PERIOD DURING THE TIME PERIOD SHOWN (DAYTIME: 7:00 A.M. TO 10:00 P.M., NIGHTTIME: 10:00 P.M. TO 7:00 A.M.)



D. L. ADAMS ASSOCIATES, LTD.

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FIGURE 2 - MAXIMUM PERMISSIBLE SOUND LEVELS FOR VARIOUS ZONING DISTRICTS

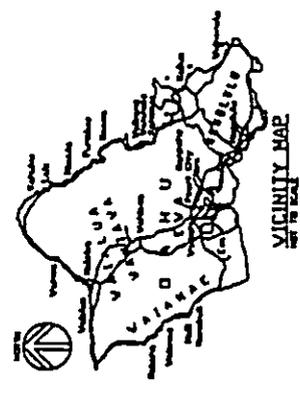
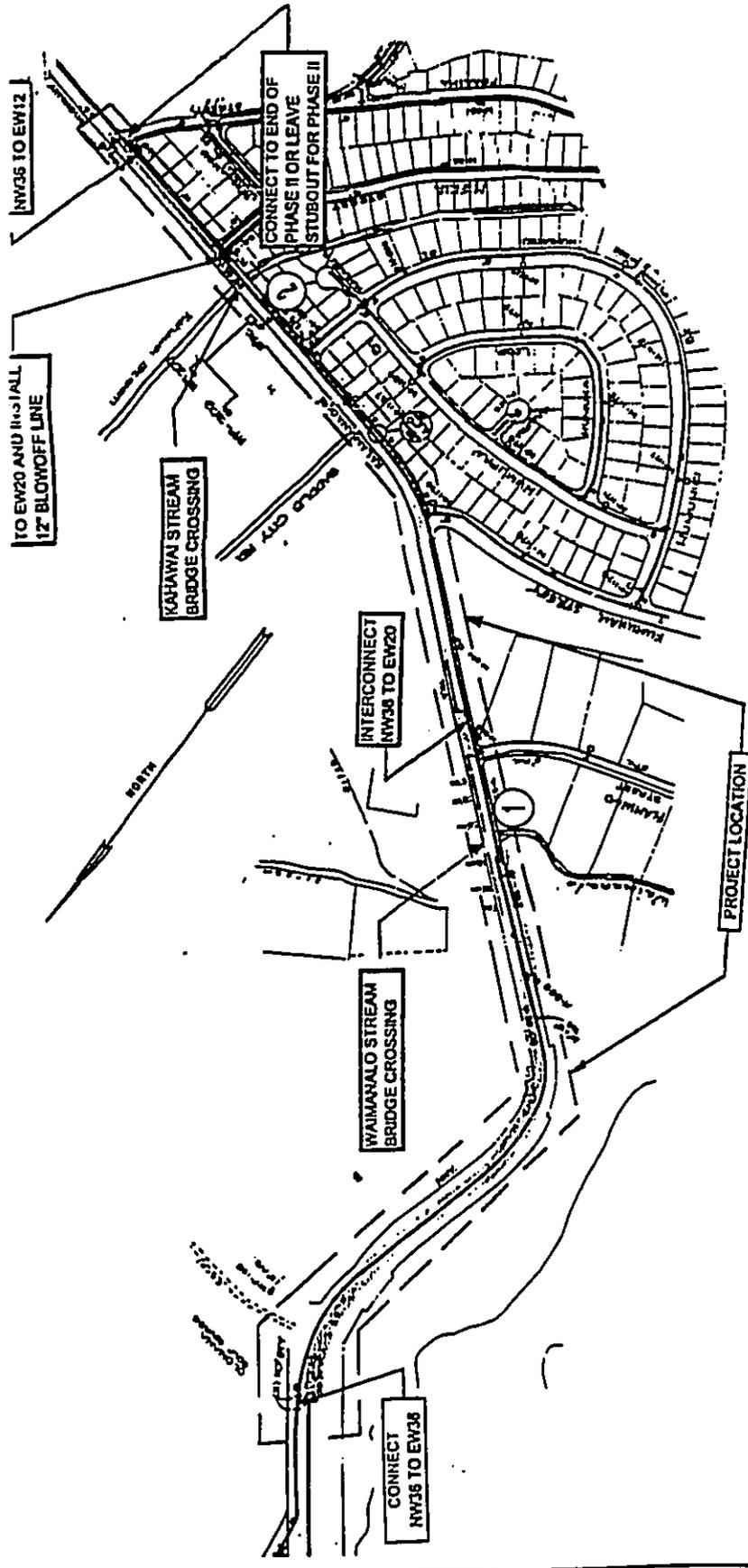


FIGURE 3 - NOISE MEASUREMENT LOCATIONS

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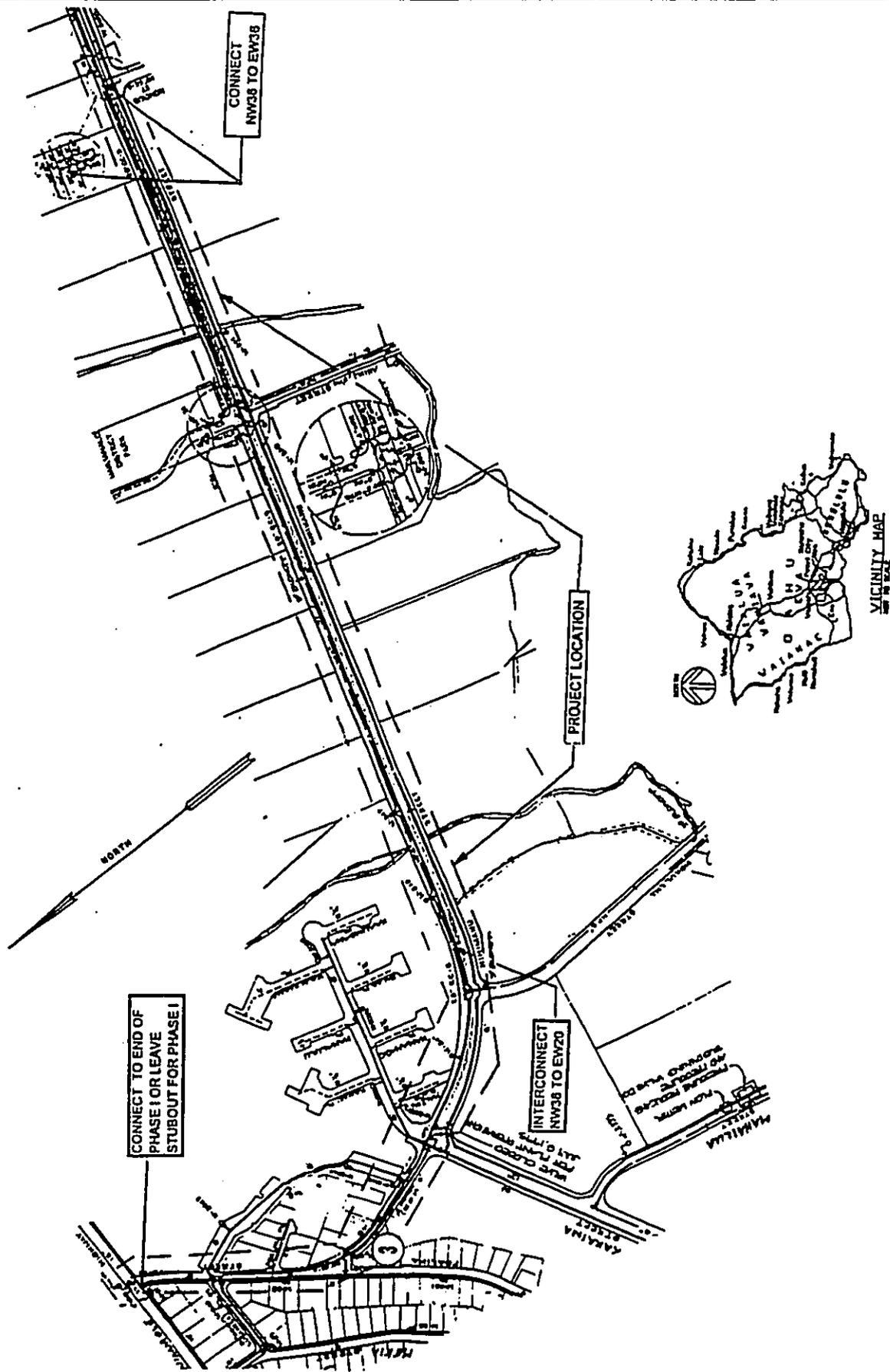


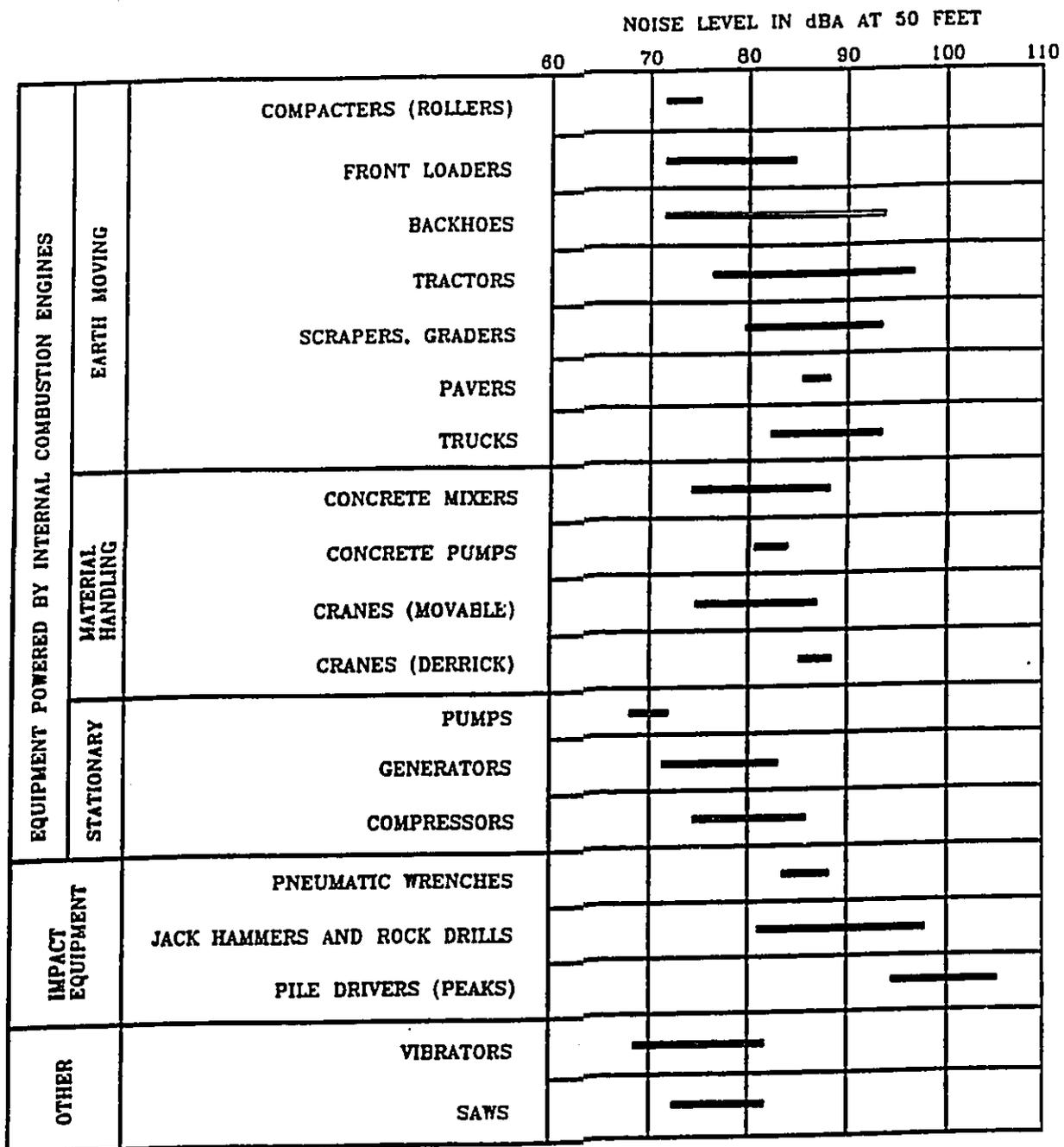
FIGURE 3A - NOISE MEASUREMENT LOCATIONS

D. L. ADAMS ASSOCIATES, LTD.

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NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES



D. L. ADAMS ASSOCIATES, LTD.

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FIGURE 4 - TYPICAL SOUND PRESSURE LEVELS FROM CONSTRUCTION EQUIPMENT

APPENDIX B

Appendix B

**Kalaniana'ole Highway: 36-inch Main, Waimanalo to Olomana
Botanical Resources Assessment
Char and Associates
Letter Report dated August 16, 2000**

CHAR & ASSOCIATES

Botanical/Environmental Consultants

4471 Puu Panini Ave.
Honolulu, Hawaii 96816
(808) 734-7828

16 August 2000

Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Attention: Glenn T. Kimura

SUBJECT Kalaniana'ole Highway: 36-Inch Main, Waimanalo to Olomana
Botanical Resources Assessment

Dear Mr. Kimura:

An assessment was made for the proposed 36-inch water main on 09 August 2000. Phase I of the project extends from the Olomana Golf Course along Kalaniana'ole Highway to its juncture with Poalima Street. Phase II runs from Poalima Street and onto Hihimanu Street where it terminates at the Nonokio Street intersection.

The primary objectives of the survey were to:

- 1) provide a general description of the vegetation along the undeveloped portions of the corridor;
- 2) search for threatened and endangered species as well as species of concern; and
- 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

The plant names used in this report follow Wagner *et al.* (1990). More recent name changes are in accordance with Evenhuis and Miller (1995-1998) and Evenhuis and Eldredge (1999).

Description of the vegetation

On the Phase I portion of the proposed water main corridor, in the area from the Olomana Golf Course towards the Waimanalo Stream Bridge crossing, the vegetation along the highway consists of a mowed grassy strip bordered by an area with low clumps of Guinea grass (Panicum maximum), and scattered shrubs of koa haole (Leucaena leucocephala), 3 to 7 ft. tall, and young trees of 'opiuma (Pithcellobium dulce). Scarlet-fruited gourd or coccinia

(Coccinia grandis), a fast-growing weedy vine, is also common to abundant.

From about Waimanalo Bridge, past Kahawai Stream, and onto Poalima Street, the corridor is bordered by a residential area. Homes border both sides of Waimanalo Stream and the stream-sides are concrete lined. Homes also line Kahawai Stream. On the makai, Olomana (northwest) side of the stream, there is a dirt road which is bordered by plantings of native plants which include naio (Myoporum sandwicense), hala (Pandanus tectorius), 'a'ali'i (Dodonaea viscosa), and ma'o (Gossypium tomentosum).

On the Phase II portion of the corridor, from Poalima Street to the intersection of Hihimanu with Mokulama Street, the proposed water main passes through a residential area. The corridor then passes over a small drainageway. The bottom of this dry drainageway contains low clumps of Guinea grass and exposed soil. Koa haole scrub lines both sides of the banks. On the mauka side of the drainageway, the koa haole scrub contains a few plants of castor bean (Ricinus communis) and Syngonium auritum vines.

From about the drainageway to its terminus at Nonokio Street, the Hihimanu Street corridor is bordered by a number of farm and plant nursery lots. The roadside is occasionally mowed or bladed and supports low mats of plants among bare soil areas. Bermuda grass or manienie (Cynodon dactylon) is abundant to common. Weedy species found here occasionally include Guinea grass, scarlet-fruited gourd, field bindweed (Ipomoea obscura), spiny amaranth (Amaranthus spinosus), swollen fingergrass (Chloris barbata), wiregrass (Eleusine indica), and Boerhavia coccinea. Behind this strip of mowed grass and weeds is a band of koa haole scrub, 12 to 20 ft. tall. Scattered here and there in between the koa haole shrubs are trees of fiddlewood (Citharexylum caudatum), Java plum (Syzygium cuminii), and Chinese banyan (Ficus microcarpa). Dense clumps of Guinea grass occur between the woody elements. In many places, a thick shroud of scarlet-fruited gourd vines drapes over the koa haole shrubs.

Discussion

The water main corridor passes through urbanized areas and agricultural lands. The vegetation along the corridor is dominated by introduced or alien plants such as koa haole, Guinea grass, Bermuda grass, and scarlet-fruited gourd. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. One small planting of native plants is found alongside the Kahawai Stream Bridge.

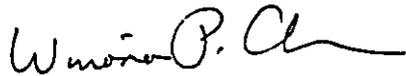
None of the plants occurring naturally on the project site is a threatened and endangered species (U.S. Fish and Wildlife Service 1990). A few plants of ma'o (Gossypium tomentosum), which is considered a species of concern (U.S. Fish and Wildlife Service 1990), are found alongside Kahawai Stream Bridge. However, the plants on this site are planted and not a naturally occurring population. Ma'o is considered a low priority species of concern. Species of concern do not receive protection under the Federal and State Endangered Species laws. These are plants whose wild populations are periodically monitored and any threats evaluated.

Given the findings above, the proposed water main project is not expected to have a significant negative impact on the botanical resources. All of the plants can be found in similar lowland environments throughout the islands.

The small planting of native plants may be impacted by the proposed project. The plants should be transplanted or repotted and moved to another site. When construction activities are completed, then the plants or new plants can be replanted along the Kahawai Stream area.

Please do not hesitate to contact me should you have any questions regarding the findings in this letter report.

Sincerely,



Winona P. Char

References

- Evenhuis, N.L. and S.E. Miller, editors. 1995-1998. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 41-56.
- Evenhuis, N.L. and L.G. Eldredge, editors. 1999. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 58-59.
- U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, HI.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. Bishop Museum Special Publication 83.

APPENDIX C

Appendix C

Wildlife Survey

Kalaniana'ole Highway: 36-inch Main, Waimanalo to Olomana, Phase 1 and 2

Tim J. Ohashi

July 17, 2000

Wildlife Survey
Kalaniana'ole Highway: 36-Inch Main, Waimanalo to Olomana,
Phase 1 and 2
Waimanalo, Oahu, Hawaii

Prepared for:
Kimura International, Inc.
1600 Kapiolani Blvd., Ste. 1610
Honolulu, Hawaii 96814

Prepared by:
Tim J. Ohashi
Certified Wildlife Biologist
P.O. Box 786
Volcano, Hawaii 96785

July 17, 2000

1.0 Introduction

A field survey was conducted on May 13, 2000 to assess the wildlife resources found along the proposed route of water mains and appurtenances along Kalaniana'ole Highway, Poalima Street, and Hihimanu Streets in Waimanalo. The objectives of the survey were to provide a record of wildlife along the proposed construction route and determine whether the project would adversely impact any important wildlife resources in the area.

2.0 Study Area

The proposed water main installation route was approximately 2 miles long, through a highly urbanized section of Waimanalo, Oahu, Hawaii.

Phase I, begins at the entrance of Olomana Golf Course on Kalaniana'ole Highway, pass residential and commercial properties, and ends on Poalima Street. Kalaniana'ole Highway is a heavily used two-lane traffic corridor that is the main thoroughfare around the southeastern tip of Oahu. The section of Kalaniana'ole Highway from Olomana Golf Course to Poalima crosses over two streams, Waimanalo and Kahawai. Both streams are channelized for flood control. A portion of the mauka portion of both streams is concrete lined before going under Kalaniana'ole Highway. The makai sections of both streams were not of concrete but the vegetation along the banks is being maintained to provide an open channel.

Phase II of the installation route, continues along Hihimanu Street to the intersection of Nonokio Street. Hihimanu Street nearly parallels Kalaniana'ole Highway and serves local traffic. The properties along Hihimanu are less densely developed. Nurseries and open fields are located along the route.

There is no native vegetation along the proposed routes in either the Phase I or II portions. Introduced trees and shrubs were present as landscaping in single family residential and apartment yards, nurseries and along the roads. Chinese banyan, Java plum, and monkey pod were the most noticeable naturalized tree species. Haole koa and Christmas berry were the most common naturalized shrub. California and Guinea grass were dominant along the banks of stream channels.

3.0 Method

An orientation visit was made on May 12 to plan the survey route and establish bird count stations. Seven count stations were established every 0.3 mi (528 yds). The bird count began on May 13, 2000, at 5:47 am and ended at 7:09 am. All birds seen and heard within 8 minutes were recorded for each station. Incidental observations were made between stations.

4.0 Results and Discussions

The usual complement of introduced birds common to the lowlands of Oahu were found along the installation route. The count picked up many birds as they flew past the count station from roost sites to forage sites. The most abundant species recorded was the chestnut mannikin, although it occurred at only one station in a large flock feeding on seeds of grasses within a public park. The second most abundant species was another seedeater, the Java sparrow. It occurred at five stations but the largest number occurred in the park in association with the chestnut mannikins, nutmeg mannikins and common waxbills. The red-vented bulbul, spotted dove, common myna and cattle egret were present at all seven count stations. One peafowl was heard as were many domestic chickens. The following is a list of introduced birds encountered during the station counts. They are listed in order of abundance.

Chestnut mannikin (*Lonchura malacca*)
Java sparrow (*Padda oryzivora*)
Red vented bulbul (*Pnycnonotus cafer*)
Spotted dove (*Streptopelia chinensis*)
Common myna (*Acridotheres tristis*)
Cattle egret (*Bubulcus ibis*)
Zebra dove (*Geopelia striata*)
House finch (*Carpodacus mexicanus*)
English sparrow (*Passer domesticus*)
Common waxbills (*Estrilda astrild*)
Japanese white eye (*Zosterops japonicus*)
Red crested cardinal (*Paroaria coronata*)
Northern cardinal (*Cardinalis cardinalis*)
Nutmeg mannikin (*Lonchura punctulata*)
Peafowl (*Pavo critata*)

The federally listed endangered koloa (*Anas wyvilliana*) duck was observed in Kahawai Stream. A pair were seen foraging along the concrete portion of the stream mauka of the Highway (photo 1). One other was seen in the stream channel on the makai side (photo 2). A native black-crowned night heron (*Nycticorax nycticorax hoactli*) was near the third koloa.

One mongoose (*Herpestes auropunctatus*) was observed along Hihimanu Street. No other mammals were seen, although there are probably feral cats (*Felis catus*), rats (*Rattus spp*) and mice (*Mus musculus*) in the area.

5.0 Conclusion and Summary

The terrestrial habitat is not suitable for native birds with the exception of the migratory Pacific golden plover, that was not encountered during the survey because it is a winter resident. The proposed installation will affect an area immediately within vehicle transportation corridors, among residential and commercial properties, which are already highly disturbed. As long as the installation does not affect the stream channel, there will be no effect on the koloa. Construction activities may cause temporary disturbance to foraging opportunities immediately adjacent to Kalaniana'ole Highway, but the koloa observed seemed to be habituated to the highly modified stream channel, the close proximity of residences and the heavy traffic on the bridges.

6.0 Bibliography

Hawaii Audubon Society. 1989. Hawaii's birds. Honolulu, HI.

U.S. Fish and Wildlife Service. 1994. Draft Revised Recovery Plan for Hawaiian Waterbirds. USFWS. Portland: OR. 96 pp.



Photo 1. A pair of koloa (*Anas wyvilliana*) in Kahawai Stream channel, mauka side of bridge over Kalaniana'ole Highway, Waimanalo, Oahu, Hawaii. May 13, 2000.



Photo 2. Koloa (left of center) in Kahawai Stream channel, makai side of bridge over Kalaniana'ole Highway, Waimanalo, Oahu, Hawaii. May 13, 2000

7.0 Appendix

Results of bird counts from seven stations, May 13, 2000. Kalaniana'ole Highway 36-inch Main, Waimanalo to Olomana, Phases 1 and 2.

SPECIES	STA 1	STA 2	STA 3	STA 4	STA 5	STA 6	STA 7	FREQ	SUM	AVE/STA
Chestnut mannikin					250			1	250	35.71
Java sparrow		7	11	5	12	12		5	47	6.71
Red-vented bulbul	6	8	4	5	12	2	9	7	46	6.57
Spotted dove	1	2	12	4	4	2	5	7	30	4.29
Common myna	5	4	5	4	5	4	2	7	29	4.14
Cattle egret	4	7	1	2	1	9	1	7	25	3.57
Zebra dove		3	3	4	4	4	3	6	21	3
Lonchura spp.		13						1	13	1.86
House finch	2	2	3		3	1		5	11	1.57
Domestic chickens			6	3				2	9	1.29
English sparrow			3	4	1	1		4	9	1.29
Common waxbill					3		5	2	8	1.14
Japanese white-eye	1	3		1	1		1	5	7	1
Red-crested cardinal	2	1	2			1	1	4	6	0.86
Northern cardinal	1		2				1	3	4	0.57
Nutmeg mannikin						2		1	2	0.29
Peafowl				1				1	1	0.14

APPENDIX D

Appendix D

**Letter from the State Historic Preservation Division,
Department of Land and Natural Resources
Dated December 8, 1999**

BENJAMIN J. CAYetano
GOVERNOR OF HAWAII



TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL HISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

December 8, 1999

Mr. Glenn T. Kimura
Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

LOG NO: 24523 ✓
DOC NO: 9912SC01

Dear Mr. Kimura:

SUBJECT: Chapter 6E-8 Historic Preservation Pre-Consultation Review for Environmental Assessments (EAs) of Two Proposed Projects by the City and County of Honolulu Board of Water Supply (BWS) in Hawaii Kai and Waimanalo

Moanalua, Kona, O'ahu TMK: 3-9
Waimanalo, Ko'olaupoko, O'ahu TMK: 4-1

Thank you for the opportunity to comment on two projects proposed by the BWS who have provided you with preliminary scopes of work for both projects. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the subject parcels.

In Hawaii Kai the BWS plans to install a 16-inch water main along portions of Kalama 170-foot Reservoir Access Road (550 linear feet), Kaekeku Street (350 linear feet), Kepaniwai Street (250 linear feet), Honokahua Street (450 linear feet), and Mokuhana Street (1000 linear feet). This work is to be carried out within the existing rights-of-way. In addition, the project includes connection to existing mains and other interconnections, installation of new fire hydrant, and drainage or stream crossing. In Waimanalo, the BWS plans to install a 36-inch water main in two phases. Phase I extends about 4,500 linear feet along Kalaniani'ole Highway from Olomana Golf Course to Poalima Street, and Phase II extends along Poalima Street about 900 linear feet from Kalaniani'ole Highway to Hihimanu Street, and about 5,000 linear on Hihimanu Street from Poalima Street to Nonokio Street. It is your understanding from the BWS that all water main installation will be carried out within existing rights-of-way of the named roadways. In addition, the Waimanalo project includes connection to existing mains and other interconnections, installation of new fire hydrants, and drainage or stream crossings. We provide the following comments.

Since the Hawaii Kai work is to take place entirely within existing roadways in Kalama

Mr. Glenn T. Kimura
Page Two

Valley, we believe that it is unlikely that significant historic sites are still present in these developed areas. Consequently, we believe that the proposed project will have "no effect" on significant historic sites in Hawaii Kai. In Waimanalo, the entire corridor also appears to be within existing roadways which, in turn, rest on a series of silty, clay, and loamy soils where it is unlikely that significant historic sites are still present, due to roadway development. The one possible exception may be the proposed stream crossings at Waimanalo and Kahawai Streams where it is possible that in undeveloped areas of the stream channels historic sites related to taro cultivation (e.g., *lo'i* or pondfields) may be present. Depending on the location of the proposed stream crossings (e.g., at new locations versus at existing bridges or drainage structures), the water main installation may have the potential to affect historic sites. Consequently, at this time we believe that the proposed water main installation within existing roadways in Waimanalo will have "no effect" on significant historic sites. With regard to the stream crossings, we request that when construction plans become available, our office be given the opportunity to review them in order to determine what impacts, if any, there may be on the two streams within the project area. Of course, should any other component of these two projects change significantly, we would appreciate being given the opportunity to review such changes, too.

Should you have any questions, please feel free to call Sara Collins at 692-8026.

Aloha,



DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk