FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

CHAPTER 343, HAWAII REVISED STATUTES (HRS)

FOR

EAST MAUI WATER

DEVELOPMENT PLAN

PREPARED FOR THE

COUNTY OF MAUI

DEPARTMENT OF WATER SUPPLY

WAILUKU, MAUI, HAWAII

PREPARED BY

NORMAN SAITO ENGINEERING
CONSULTANTS, INC.

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

CHAPTER IV. IMPACTS ON THE PHYSICAL ENVIRONMENT

LIST OF FIGURES

EXHIBITS

CHAPTER I. INTRODUCTION AND SUMMARY

1.1 INTENDED USES OF THIS DOCUMENT

This environmental impact statement (EIS) has been prepared to examine the environmental acceptability of the East Maui Water Development Plan (EMPLAN) . An environmental assessment/ preparation notice was prepared and filed with The Office of Environmental Quality Control for publication in the Bulletin dated July 8, 1992. At the same time, a direct mailing was made to over 50 agencies, community groups, and private individuals requesting their comments, if any, on the proposed EMPLAN project. Their comments and the County's responses are contained in Chapter XI.

The Draft EIS (DEIS) was prepared and filed with the Board of Water Supply, County of Maui as the accepting authority on October 23, 1992. Copies of the DEIS were also filed with OEQC and mailed to the list of consulted parties identified in Chapter X. Of the 65 copies of the DEIS mailed out to interested agencies and organizations, 17 responses were received. These comments and the responses are contained in Chapter XII.

This FEIS is intended to comply with Chapter 343, Hawaii Revised Statutes and the EIS regulations promulgated by Chapter 200 of Title 11, Department of Health. The purpose of this document is to provide information to public agencies and members of the affected communities about the nature of the subject action; to assess the environmental conditions of the properties involved in the proposed alignment; to evaluate the potential impacts of the proposed action on the affected communities and economic activities; and to consider alternatives to the proposed action.

1. 2 DESCRIPTION OF THE PROPOSED ACTION

The EMPLAN proposes the design and construction of water transmission lines, storage reservoirs, and the development of source wells for a total pumping capacity of approximately 16 million gallons per day (MGD). This Plan is designed to meet the potable water needs of the Central Maui Water District for the next twenty years. As the system is developed, there will be periodic review and evaluation of both the water demand and the Community Plan ordinances that mandate the availability of potable water for future urban growth.

1. 3 RATIONALE FOR ACTION

The Department of Water Supply (DWS) is responsible for the development, operation and maintenance of the Maui County Drinking

Water System. The Maui County Water Use and Development Plan is the DWS' long range planning document. The County's long range planning is stated in the County's General Plan and is used as a basis for formulating the nine Community Plans. The General Plan Objectives and Policies are more specifically reflected and expanded in the various Community Plans. Both the General Plan and the Community Plans were adopted in the early to middle 1980s and the General Plan was revised in September, 1991. The Community Plans are required to be updated at least every ten years to incorporate changes to population, economic conditions, and subsequent shifts in land uses. The updating of the Community Plans is now being done to assure that regional goals and objectives are being applied to current planning issues. The Community Plan areas of Wailuku-Kahului, Kihei-Makena, and Paia-Haiku have been determined to be areas that will experience planned growth in the next twenty years. This growth will result in increased demand for utilities, i.e. Water, Waste water treatment and disposal, Police and Fire protection services, and Solid Waste management.

In the ten years that have passed since the adoption of the Community Plans, definite changes in the County's economic base have resulted in corresponding changes in the direction that the County's resources have also taken. In water consumption, agriculture continues to be largest water user on Maui. Sugar and Pineapple are still the dominant agricultural economic factors, although diversification in agriculture is growing. Today, Maui County's economy has seen the emergence of the visitor industry as a mainstay and economically viable alternative to agriculture in terms of land use and as an employer.

The 1980 Community Plans were designed to address land use policy issues in broad guidelines that identified available undeveloped land in summary form, the Community Plan designations for these available lands, and the subsequent County services that are required to fully utilize these lands. In updating the Community Plans, it is necessary to address the demand for County services based on the need identified in the expanded growth areas, areas that were previously undeveloped. The final conclusion is that all segments of the County need water to grow as planned. Physical limitations of existing water sources have made it necessary to explore the development of water in areas of the County where water is underutilized. This strategy is essential if the DWS is to expeditiously address the stated goals of the Community Plans.

1. 4 SUMMARY OF PROBABLE IMPACTS

Land Use The portions of the proposed project alignment will be irretrievably committed to public facility uses.

Flora and Fauna No endangered flora or fauna species are anticipated in the proposed alignment. Certain avifauna species may be disrupted

during the construction phase in the uninhabited gulch areas, but these disruptions are not of a permanent duration.

Historic/Archaeological Resources The technical study conducted for this project did not indicate the presence of any significant historic or archaeological sites in the proposed alignment. A project monitoring plan will be designed for use by the general contractor so that if sites are discovered in the construction phase, appropriate action can be taken.

Agricultural Potential There will be no major or significant economic impacts to the agricultural zoned lands along the proposed alignment. The DWS has done preliminary planning in conjunction with the affected landowners to minimize physical as well as economic impacts to sugar/pineapple operations.

Noise - Ambient noise levels will be exceeded during the construction phase. After completion of the alignment, the noise levels will not be significant as water will be confined in the pipeline and will be quiet. Well pump noise may be a factor, but due to their relative isolation, it will not be a significant contribution.

Transportation Facilities - Traffic will be temporarily impacted during the construction phase, particularly if installation of the alignment takes place in existing State/County roads rights-of-way. All contractors will be responsible for traffic control management during construction.

Air Quality - Ambient air quality standards may be exceeded during the construction phase, particularly with fugitive dust from trenching and materials hauling. Contractors will be responsible for dust abatement measures if considered necessary by the State Department of Health.

1.5 SUMMARY OF MITIGATING MEASURES

Construction related impacts such as soil erosion, fugitive dust and noise level violations due to construction equipment will be minimized by recognized construction techniques such as dust control sprinkling of the project alignment, noise abatement equipment on construction vehicles and machinery, and construction phasing.

1.6 SUMMARY OF UNRESOLVED ISSUES

The existing Community Plans for the areas affected by the proposed alignment are in various stages of review and updating. Due to the time required to complete this project , both the Community Plans and the physical ability of the well source sites to produce the planned water will be continually reviewed. The number of wells to be developed is

dependent on the aquifer conditions, and the ability of the aquifer to provide the required yield for transport to the Central Maui Water System. Planning guidelines may also be subject to evaluation and change due to new guidelines developed in the periodic land use policy plan review. These in turn could affect the demand and consequently, the planned development of the EMPLAN.

1.7 RELATIONSHIP TO LAND USE PLANS AND POLICIES

Chapter III contains a detailed discussion of the relationship between government plans and policies and the proposed project. The East Maui Water Plan is consistent with the current Maui County General Plan, and with affected Community Plan objectives and policies.

1.8 ALTERNATIVES CONSIDERED

The alternatives considered for this proposed project were various alignment scenarios which were reviewed by the DWS and alternative development of other sources of water i.e. desalination, surface water, and the Waihee Aquifer. These alternatives are discussed in greater detail in Chapter VII. The weighted values obtained from an economic analysis were the principal decision making tools employed in the selection process. The "No Action" alternative was not considered since the Community Plans had established the current need and long term future need for water in Wailuku-Kahului , Paia-Haiku, and Kihei-Makena.

1.9 LIST OF NECESSARY PERMITS AND APPROVALS

Authority	Approval Required
Federal	
Army Corps of Engineers	404 Permit
State of Hawaii	
DLNR - Comm.on Water Resource Mgt.	Pump/Well permits Stream Alteration Permit
Dept. of Health	New Water Source/System; 401 Clean Water Act
Dept. of Transportation Highways Division	Construction Plan Approval
County of Maui	
Planning Dept.	Community Development Plan Compliance
Dept. of Public Works	Building permit/Grading Permit

CHAPTER II. PROJECT DESCRIPTION

This Chapter presents descriptive information on the proposed EMPLAN project. The project site is first located and then briefly described. A brief background summary of the purpose is presented, followed by an overview of the main features of the proposed development. A discussion of the EMPLAN objectives and the development schedule is then provided. Finally, the project's phasing schedule is provided. *Data is from the East Maui Water Development Plan.*

2.1 Location

The EMPLAN will involve the design and construction of approximately 86,000 lineal feet of transmission line and approximately 24,000 lineal feet of connecting pipes from East Maui sources to the Central Maui Water System. This project will begin from the Haiku and Paia well field sites to the Central Maui Water System near the Kuihelani Highway. (See FIGURE 1) In addition to the lengths of transmission and connection pipelines, there will be well sources developed, and storage reservoirs designed and built.

2.2 Project Master Plan

The EMPLAN is a project that is on an accelerated schedule for implementation due to the precarious nature of the Iao aquifer's ability to provide an adequate and continuous supply of potable water for Central Maui customers. The EMPLAN involves the construction of a system that would normally be expected to be in place by the year 2012.
This plan involves the building of a 36" transmission main from the East Maui sources to a point of connection to the existing 36" Central Maui Water Transmission Main. Between Hamakuapoko and the Central Maui Water Transmission Main, three connections to the Central Maui System will be made. These connections will be at Puunene, Haleakala Highway, and Paia.
Five pairs of exploratory wells are planned in the Hamakuapoko-Haiku area. The wells are anticipated to produce a pumping capacity of 16MGD and an average yield of approximately 10 MGD. Water from the wells, will pass through 100,000 gallon (minimum)storage/chlorine contact tanks. The tanks have been sized to service the lower elevation Haiku area, thus expanding the area served by the Central Maui Water System. (See FIGURE 3)

2.2.1 Project Master Plan Objectives

The DWS is focusing on a development plan to meet the future water requirements in the Central Maui area. The Central Maui Water Service area is generally considered as the isthmus which connects the East and West Maui Mountains from Waihee to the North, Makena to the South, Paia-Kuau to the East, and Wailuku to the West. The Central Maui Water Service Area includes the entire Maui Community Plans of Wailuku-Kahului, Kihei-Makena, and the

Paia-Kuau portion of the Paia-Haiku Community Plan. The Central Maui Water System will be expanded to include portions of the Haiku area capable of being supplied from these sources.

2.2.2 Project Master Plan Land Use

The EMPLAN sources of ground water development are primarily in the areas east of the Central Maui Water Service Area. Existing and new exploratory wells in the Paia-Haiku area have provided preliminary evidence of potable quality water that can be developed in adequate quantities. The source development area is primarily in agricultural lands, and/or undeveloped vacant lands. The terrain features are varied, with the emphasis being placed on road rights of way for the transmission lines, with well sources being at elevations that provide both the gravity transmission capability as well as minimum drilling.

2.3 Project Phasing Schedule

The Plan is to develop sources nearest the Central Maui Service Area (Hamakuapoko) and head east. Phasing of the transmission pipelines is planned to proceed in a westerly direction ending with a connection to the existing central Maui Water Transmission Main. At the end of each pipeline phase, an inter-connection to the Central Maui Water System is proposed. The recommended Kaheka Route is depicted on **FIGURE 1**, with the phasing plan provided on the foldout. The phased development of 16 MGD of water is anticipated to occur over a 15 year period and not at one time.

The Maui County Planning Department (MCPD) is conducting a 20 year infrastructure assessment including water demand projections. The following graph (Figure 2) is the total consumption taken from the water system assessment section of the MCPD report for Wailuku-Kahului and Kihei-Makena (Paia-Haiku not included) under constrained and unconstrained conditions. The graph reflects a 20 year range between 25 to 29 MGD. The EMPLAN Schedule (shown below) is based on the unconstrained growth condition; it is therefore a conservative plan. The EMPLAN however is flexible; if the growth deviated from the unconstrained growth, the schedule can be changed to respond to the needs as they arise.

2.3.1 Phase 1

This initial phase will provide for well development in the Paia Aquifer and a transmission system to the Central Maui Water System. Two wells are proposed at Hamakuapoko, and if successful, these exploratory wells will be converted to production wells. (SEE **FIGURE 5**) Anticipated capacity for each well is 1.0 MGD. The production wells will be connected from the well sources to Paia where modifications to the existing water system between Paia and Kahului are proposed to permit full flow of the anticipated 2.0 MGD to Kahului. **This Phase 1 is projected to be completed by June, 1993 and is estimated to cost $10.273 million in 1992 construction dollars.**

2.3.2 Phase 2

This second phase is the most intricate and expensive of the phases since it involves a long length of pipeline from Kailua Gulch to Haleakala Highway as well as crossing Maliko Gulch. The high cost and extensive engineering are due to the required crossing of Maliko Gulch. The proposed method for crossing the Gulch consists of placing the waterline on the slopes of the Gulch above ground, supported on concrete pedestals. The waterline across the floor of Maliko Gulch may be supported by trestles or buried encased in concrete. Maintenance is a vital criterion in the decision making process. Prior to selection of a final alignment, an archeological survey is being conducted to determine if there are any significant archaeological sites on the alignment. Phase 2 is anticipated to provide an additional 3.0 MGD source capacity for a combined total of 5.0 MGD source capacity from East Maui. An estimated 0.3 MGD from the Haiku Well will be used to service a portion of the Haiku area. The transmission capacity would be 5.0 MGD. Estimated costs for this Phase 2 would be $16.562 million. Estimated construction completion time is June, 1994.

2.3.3 Phase 3

The third phase involves the development of two more wells in the Haiku Aquifer along with associated site and connection work. Transmission system work in this phase will involve the installation of a 36" pipeline along Hansen Road completing the connection from Haiku to Puunene/Kahului. At Puunene, a connector into Kahului completes the work of this phase. Completion of this third phase will allow for 9.6 MGD of water to enter the Central Maui Service Area (Kahului-Paia) . The two additional wells will increase the source capacity in the East Maui area to 8.0 MGD. Estimated cost for this phase is $10.030 million and is planned for completion by December, 1996.

2.3.4 Phase 4

The fourth phase adds two more wells in the Haiku Aquifer with associated site and connection work. This phase will take place in the Kuiaha area. The two additional wells will bring the total pumping capacity in the East Maui area to 12.0 MGD and the transmission capacity to 11.2 MGD. Estimated cost for the fourth phase is $4.154 million and completion time is scheduled for June, 1999.

2.3.5 Phase 5

Phase 5 involves the connection between Puunene and the Central Maui Transmission Main with a 36" pipeline. This will complete the East Maui Transmission Line. This phase will not add source capacity to the system, but will increase the water delivery capability to 25 MGD. Estimated cost for the fifth phase is $3.947 million and is estimated for completion by January, 2001.

2.3.6 Phase 6

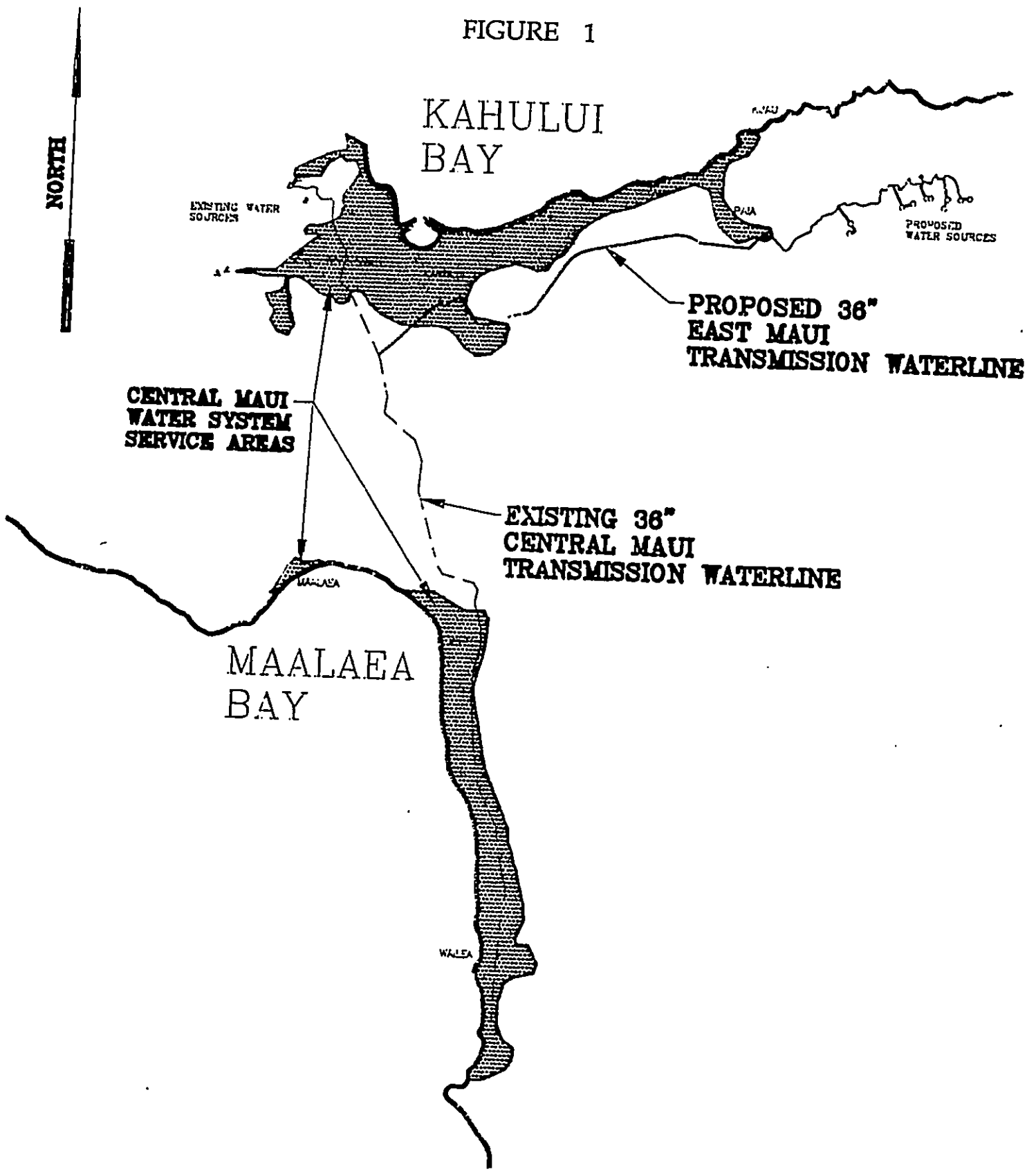
Phase 6 involves the development of two more wells in the Haiku Aquifer. However, one of these wells is not considered in the source capacity since this phase contains the largest pump in the East Maui source. Also projected for Phase 6 is a 100,000 gallon chlorine contact/control tank and 1000 linear feet of 36" transmission main in Haiku Road. This sixth phase will result in an East Maui total pumping capacity of 16.0 MGD and a source capacity of 14.0 MGD*. The East Maui Transmission capacity would be 25 MGD. Estimated cost for this sixth phase is $3.535 million and completion time is estimated for June, 2004.

* Less largest pump in the East Maui System.

2.3.7 Summary of Costs

The East Maui Development Plan will cost an estimated total of $48.5 million dollars by the year 2004. It should be noted also that two additional wells will be needed to meet the 18.6 MGD projected demand. These wells and the total Plan can be evaluated on a timely review basis by the Department and also the County Administration as aquifer capacity and water demand rates are completed and put into service. Planning decisions will need to be made based on the aquifer 's physical ability to provide adequate yield, development of alternative water sources , water conservation education programs, and the rate of growth Maui County plans to reach by the year 2012.

FIGURE 1



PROJECT SITE PLAN

PROPOSED EAST MAUI TRANSMISSION WATERLINE

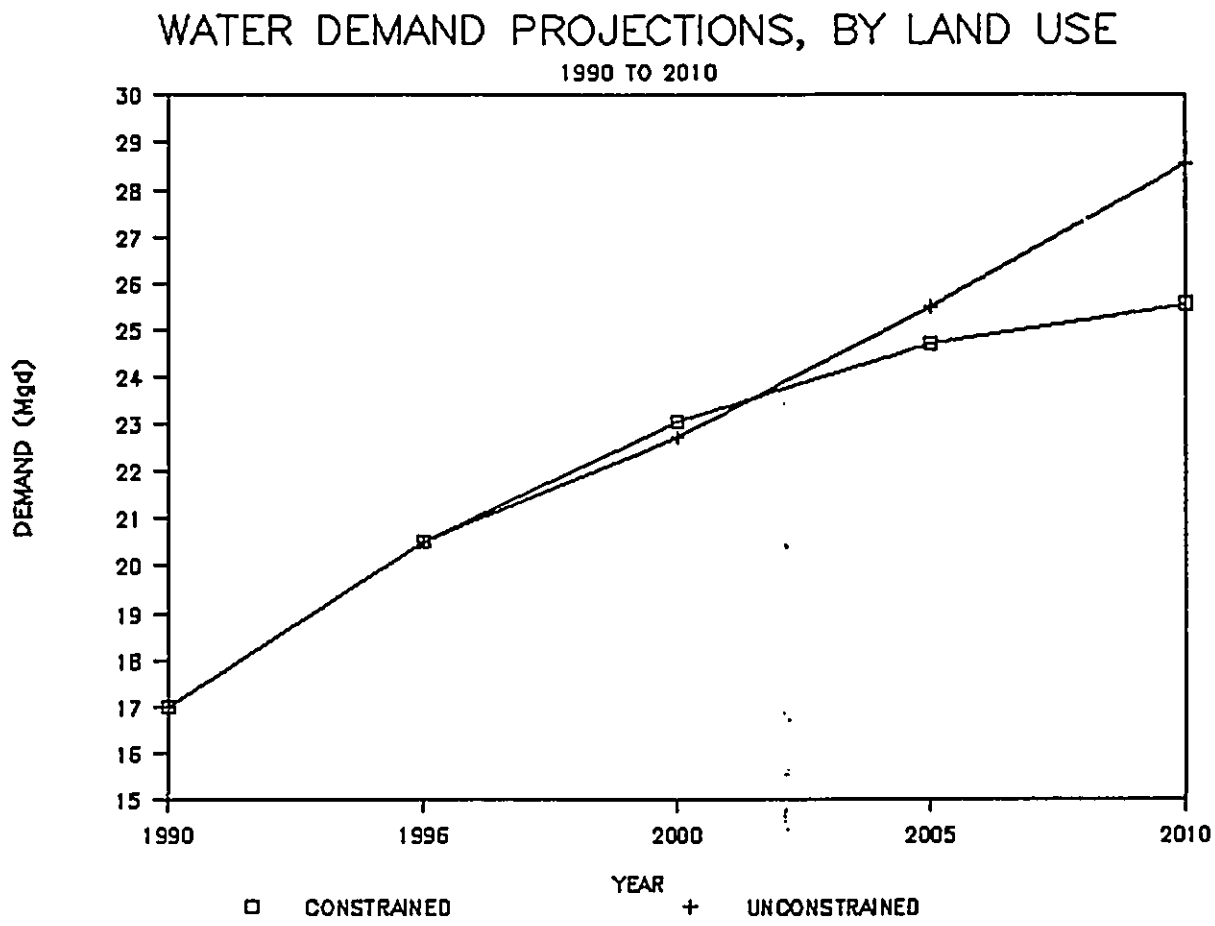

WATER DEMAND PROJECTIONS, BY LAND USE
1990 TO 2010
DEMAND (Mgd)
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
1990
1995
2000
2005
2010
YEAR
CONSTRAINED
UNCONSTRAINED

FIGURE 2

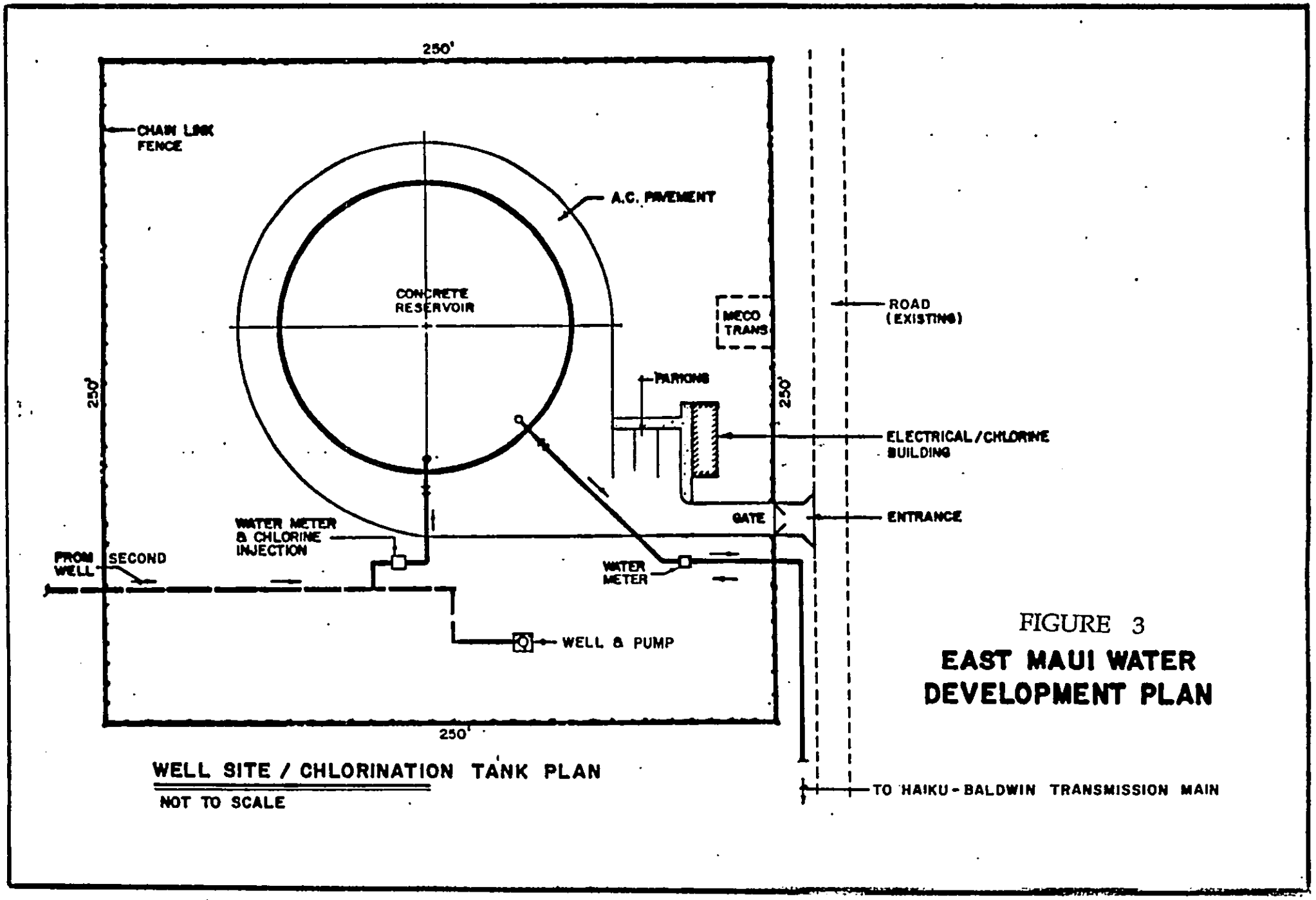
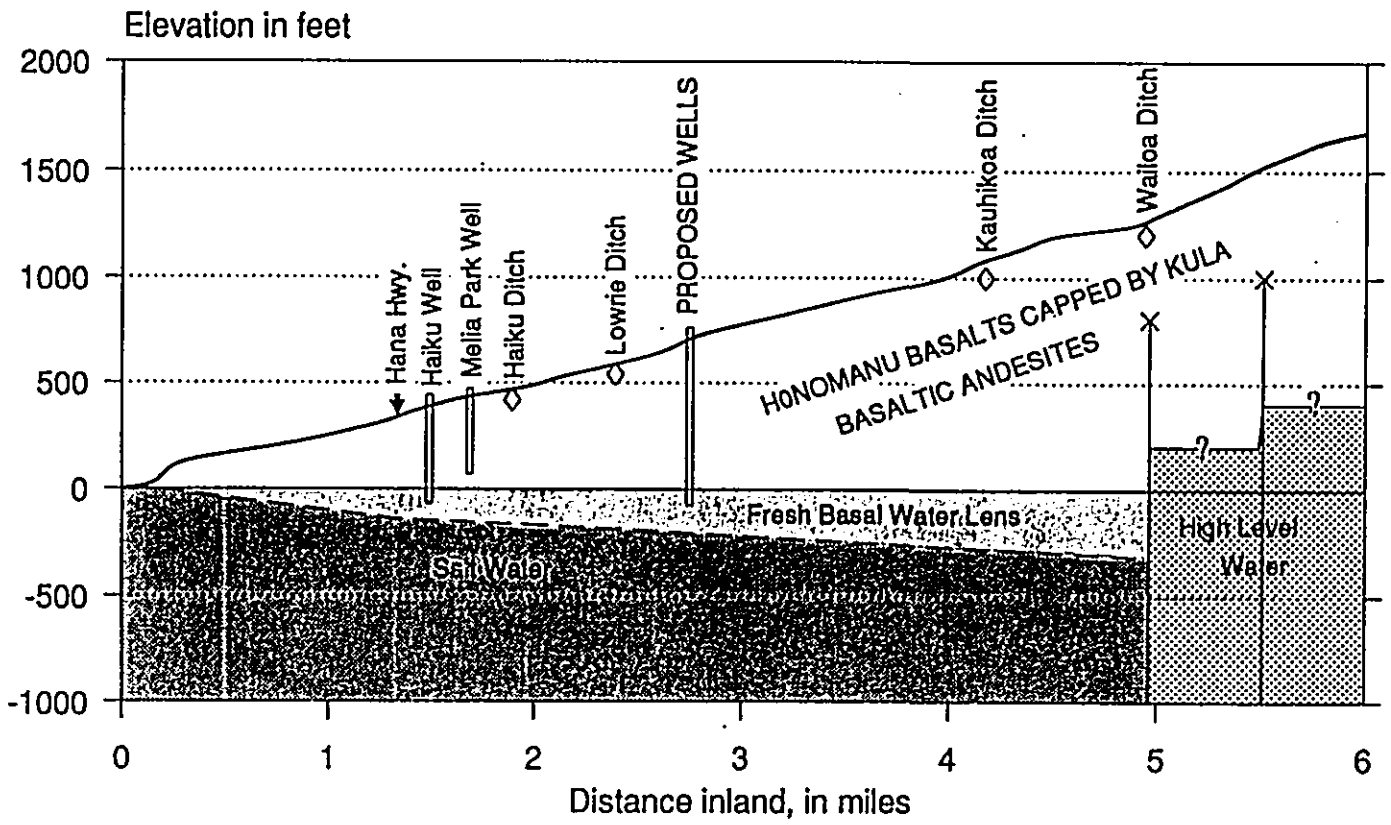


FIGURE 3

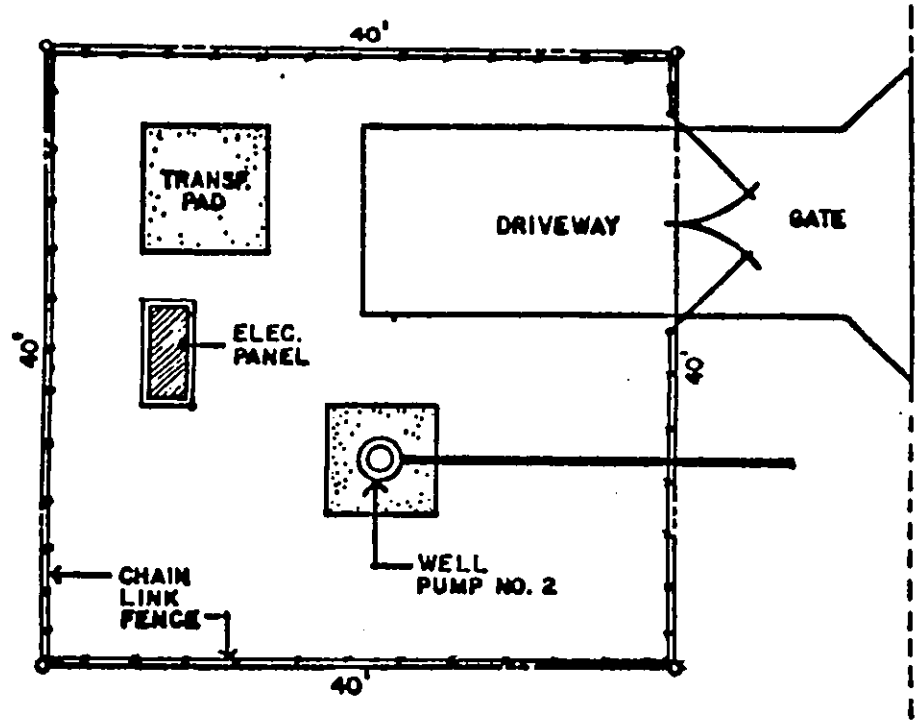
EAST MAUI WATER DEVELOPMENT PLAN

INTERPRETIVE HYDROGEOLOGIC SECTION
Haiku area
East Maui



Water Resource Associates
032

FIGURE 4



SITE PLAN
WELL PUMP NO. 2

NOT TO SCALE

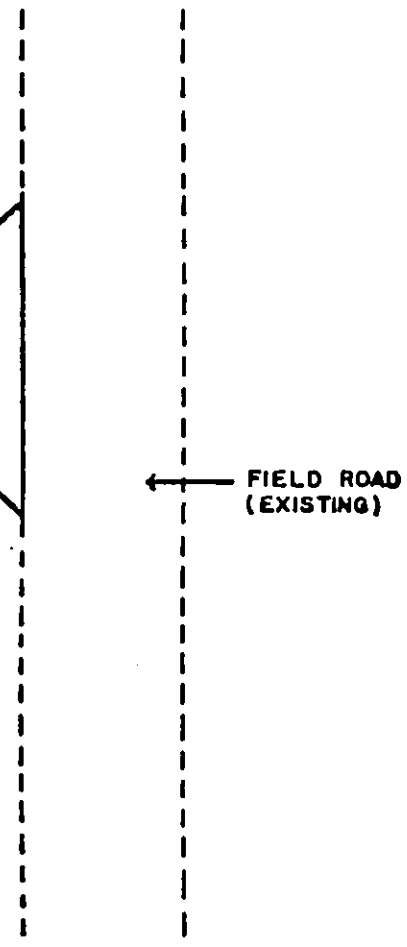


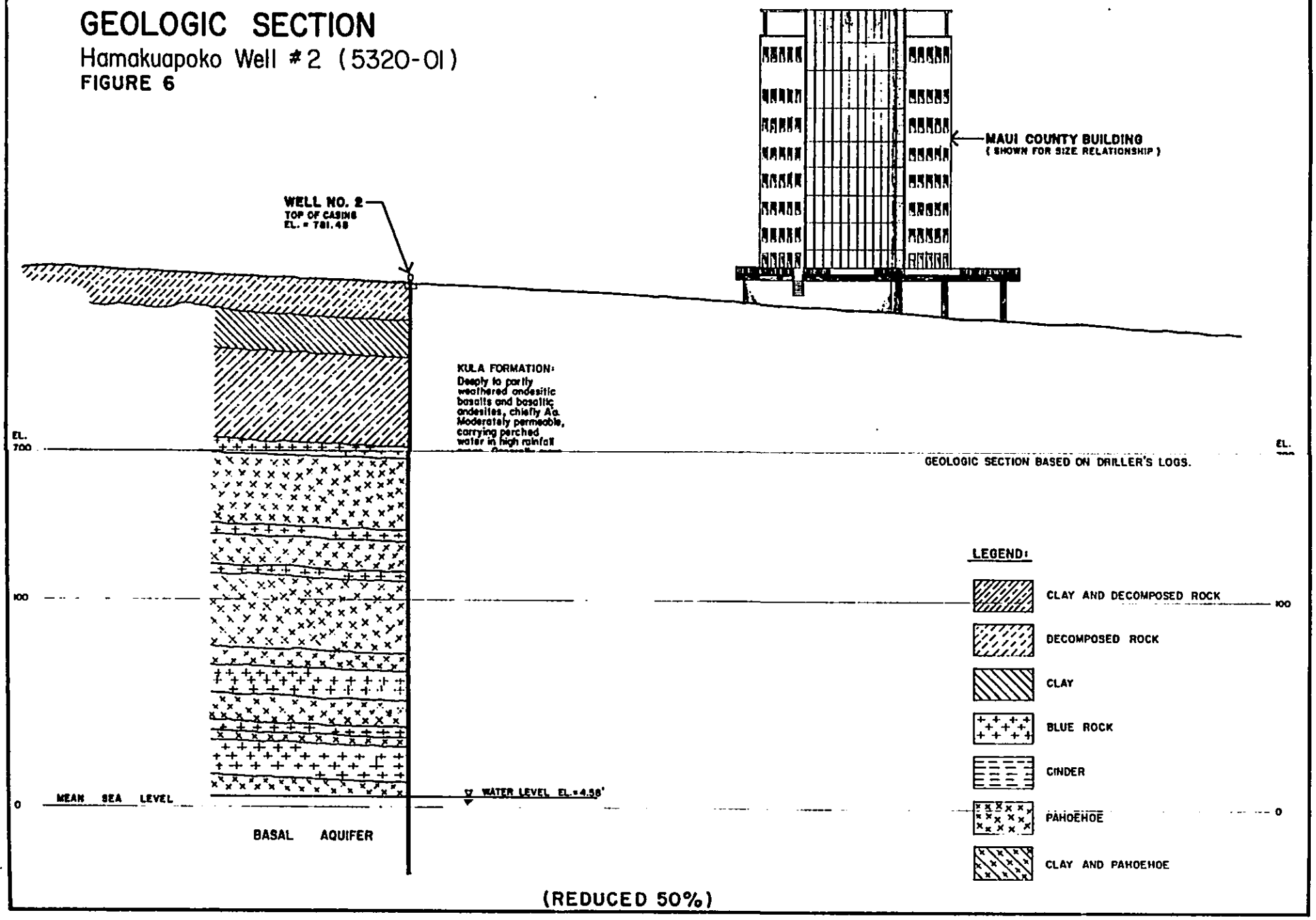
FIGURE 5

EAST MAUI WATER DEVELOPMENT PLAN

GEOLOGIC SECTION

Hamakuapoko Well #2 (5320-01)

FIGURE 6



(REDUCED 50%)

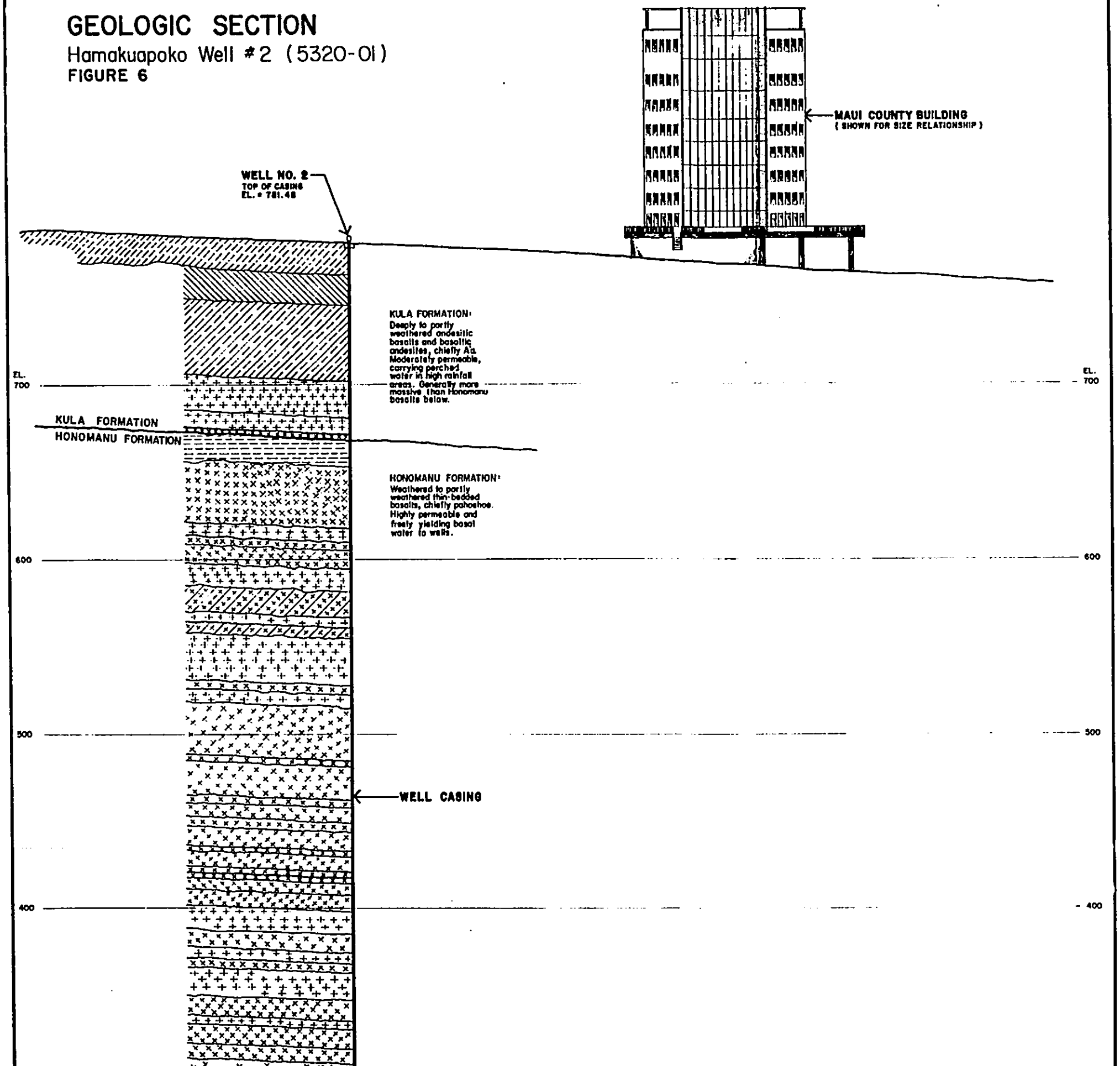
CORRECTION

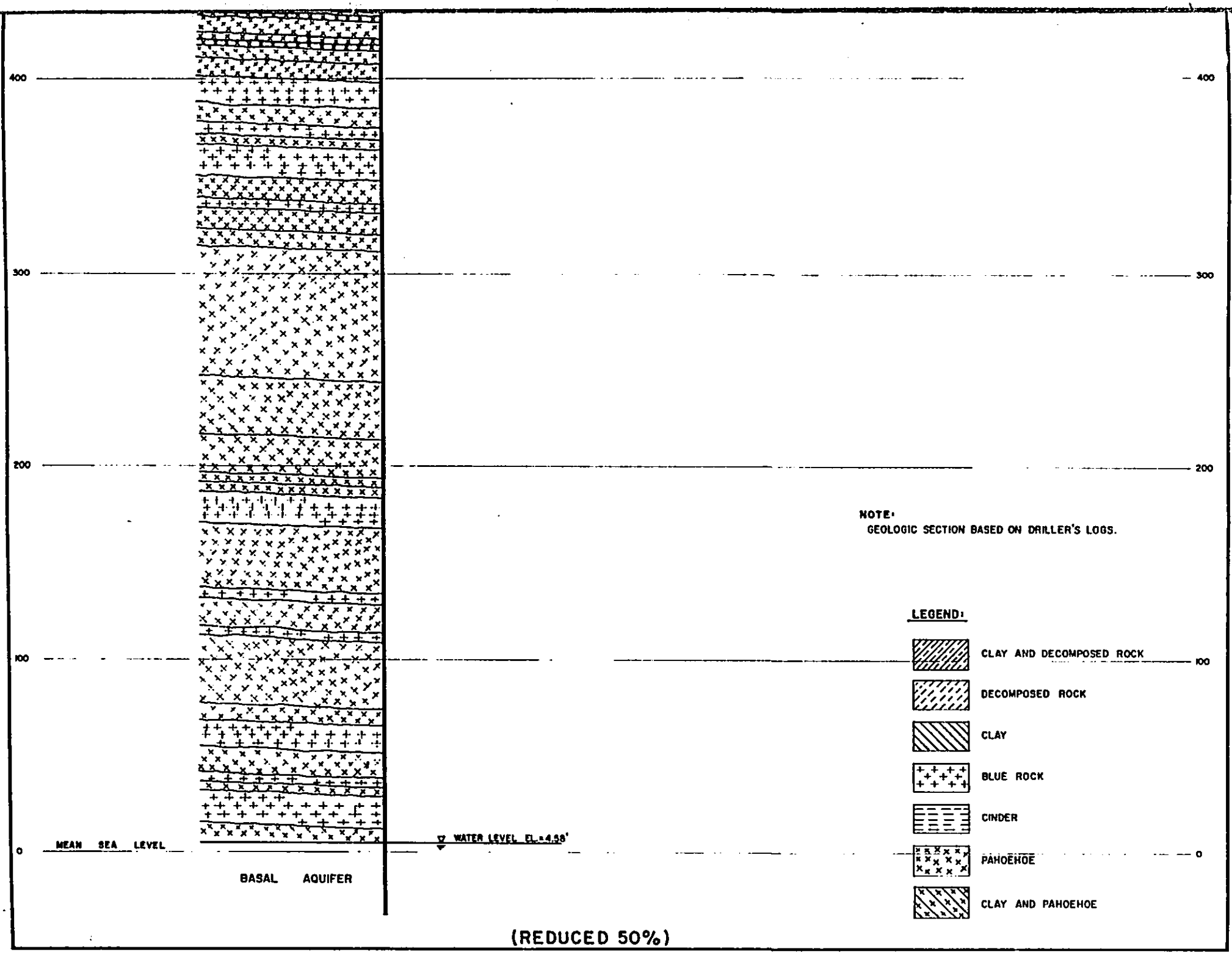
THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

GEOLOGIC SECTION

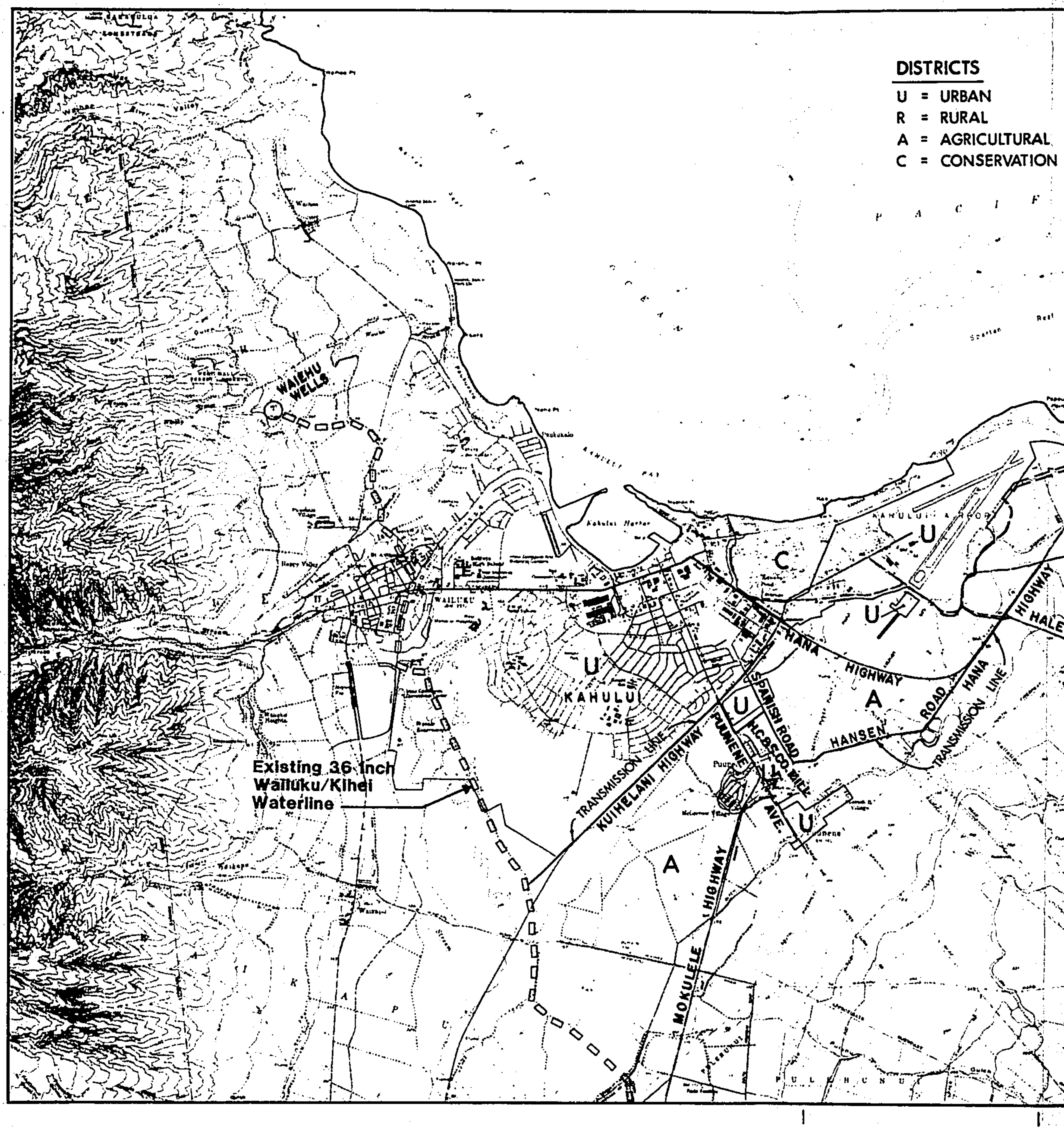
Hamakuapoko Well #2 (5320-01)

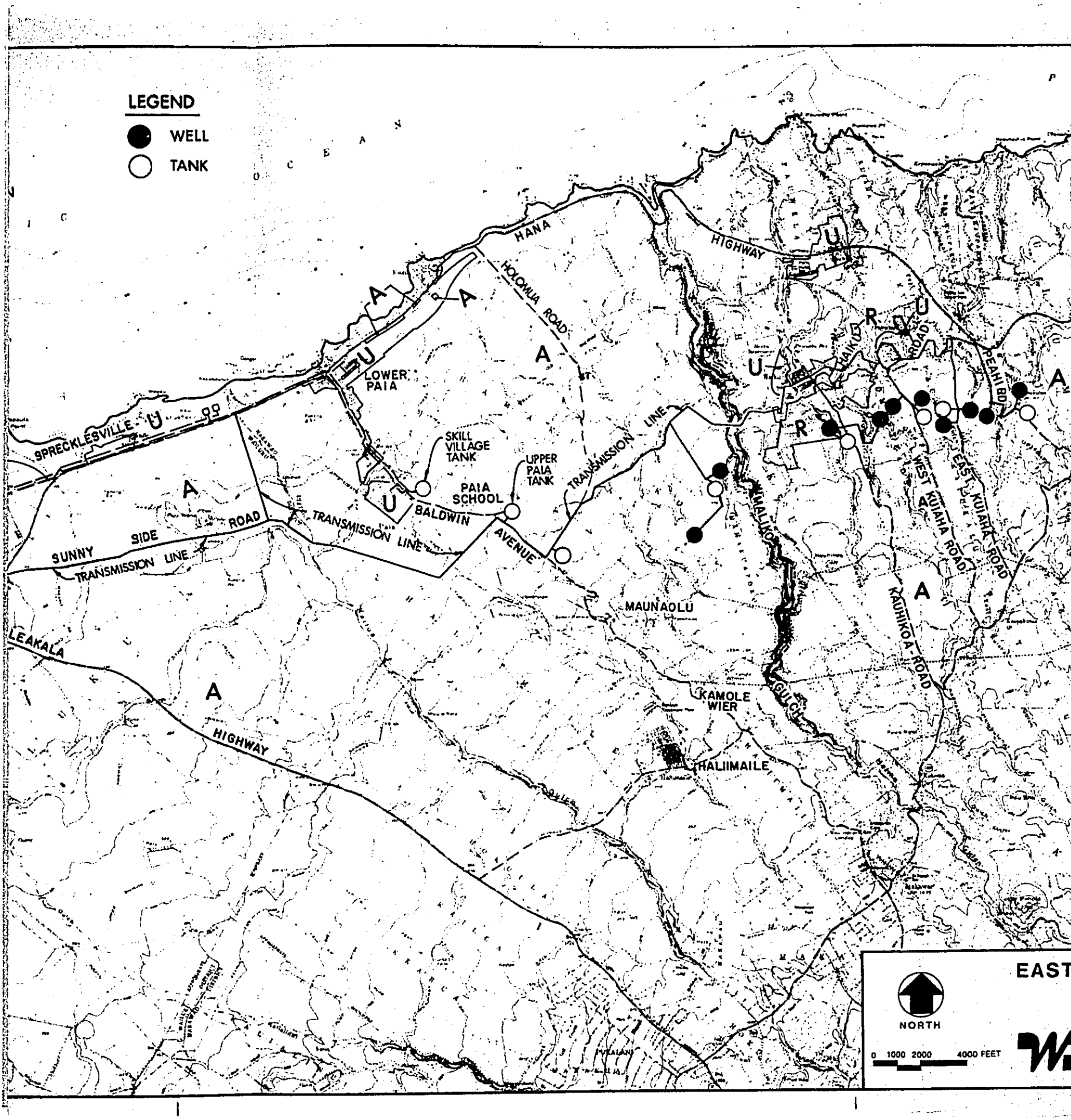
FIGURE 6

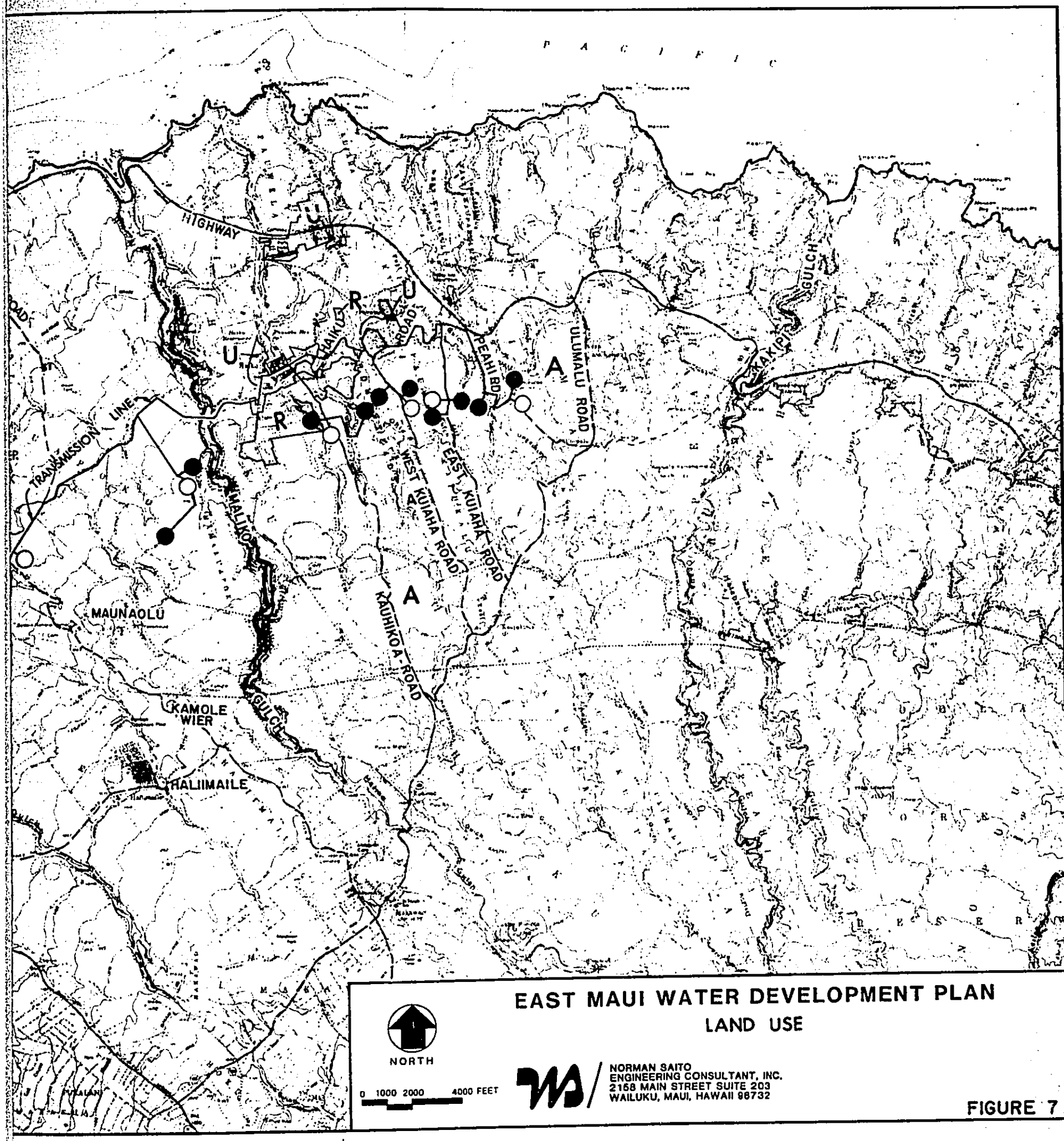



400
300
200
100
0
MEAN SEA LEVEL
WATER LEVEL EL.+4.58'
BASAL AQUIFER
NOTE:
GEOLOGIC SECTION BASED ON DRILLER'S LOGS.
LEGEND:
CLAY AND DECOMPOSED ROCK
DECOMPOSED ROCK
CLAY
BLUE ROCK
CINDER
PAHOEHOE
CLAY AND PAHOEHOE

(REDUCED 50%)


DISTRICTS
U = URBAN
R = RURAL
A = AGRICULTURAL
C = CONSERVATION
WAIEHU WELLS
Existing 36 inch Wailuku/Kihei Waterline
KAHULUI
HANA HIGHWAY
HANSEN ROAD
HANA HIGHWAY
TRANSMISSION LINE
SPANISH ROAD
H.C.&S.CO. BRIDGE
PUUNENE AVE.
KUIHELANI HIGHWAY
MOKULELE HIGHWAY
U
C
A


LEGEND
WELL
TANK
HANA
HIGHWAY
HOLOMUA ROAD
LOWER PAIA
SKILL VILLAGE TANK
UPPER PAIA TANK
PAIA SCHOOL
BALDWIN AVENUE
TRANSMISSION LINE
SPRECKLESVILLE
SUNNY SIDE
ROAD
TRANSMISSION LINE
LEAKALA
HIGHWAY
MAUNAOLU
KAMOLE WIER
HALIIMAILE
MAKAWAO
PEAHI RD
WEST KUIAHA ROAD
EAST KUIAHA ROAD
KAUHIKOA ROAD
NORTH
0 1000 2000 4000 FEET
EAST



EAST MAUI WATER DEVELOPMENT PLAN

LAND USE

NORMAN SAITO
ENGINEERING CONSULTANT, INC.
2158 MAIN STREET SUITE 203
WAILUKU, MAUI, HAWAII 96732

FIGURE 7

CHAPTER III

RELATIONSHIP OF THE PROPOSED PROJECT TO EXISTING PUBLIC PLANS, POLICIES AND CONTROLS

This Chapter presents a discussion on relevant State and County Plans, policies and controls which affect the proposed project. No Federal controls were found to be relevant to the proposed action. Objectives and policies of the Hawaii State Plan are discussed first, followed by discussion of relevant State Functional Plans. This is then followed by a review of applicable provisions of the State Land Use Law. The relevant sections of the Maui County General Plan which applies to the pertinent Community Development Plans (Paia-Haiku, Kihei-Makena, and Wailuku-Kahului) are then discussed. Finally, the applicability of the Coastal Zone Management Act and Chapter 343, HRS are examined.

3.1 HAWAII STATE PLAN

The Hawaii State Plan serves as a guide for the future long term development of the State. It includes goals, objectives, policies, and priorities for the State, a basis for determining priorities, and allocating limited resources, and a process of coordination of State and County Plans. In addition to the State Plan, twelve functional plans (Sec.3.2) have been developed which set forth the policies, statewide guidelines, and priorities within specific fields of activities. In this section (Sec. 3.1) State Plan objectives and policies relevant to the proposed project are presented and discussed. Policies that are also included in the functional plans are discussed under the appropriate headings.

State Plan item: (226-5) Objectives and Policies for Population

(b) (3) *"Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State."*

Comment: The incremental expansion of the East Maui Water Development Plan is necessary to accommodate population growth as mandated by the Maui County Community Plans for the Paia-Haiku, Kihei-Makena, and Wailuku-Kahului Community Plan areas. The costs for the installation of these facilities and subsequent services to support increased population associated with the planned community growth will be included in capital improvement budgets prepared by the Board of Water Supply . All capital improvement projects will be designed and built to applicable Maui County standards.

State Plan item : (226-6) Objectives and Policies for the Economy in General

(b) (6) *"Strive to achieve a sustained level of construction activity responsive to and consistent with, State growth objectives."*

Comment: The County Administration has strived to maintain a balanced and sustained level of construction activity to the best degree practicable. This is especially the case in terms of infrastructure and utilities. Water Demand based on urban growth patterns has exceeded the ability of the County to meet certain goals and objectives, but a concerted effort to provide the basic utilities and services has been successful. Present and future construction planning is intended to insure that the local economy will not decline from lack of projects.

State Plan item: (226-13) Objectives and policies for the Physical Environment (Land, Air and Water Quality)

(b) (7) *Encourage urban development in close proximity to existing services and facilities."*

Comment: The three specific Area Community Plans have been complied with; the proposed project will provide water required to sustain urban development.

State Plan item: (226-24) Objectives and Policies for Facility Systems in General.

(b) (1) *"Accommodate the needs of Hawaii's people through improvement priorities established through the planning process."*

Comment: Directed growth for the three affected Community Plan areas has been the subject of the planning process by the Administration and also the County Council. Full discussion has been provided by the Executive and Legislative branches to insure that the planning process has not been compromised. The resulting County ordinances clearly state the direction and type of growth that is planned for the next ten years, and this project will support that planned growth policy.

State Plan item: (226-104) Population Growth and Distribution Priority Guidelines.

(a) (4) *" Seek to provide for adequate housing to meet the needs of Hawaii's people without encouraging an additional influx of people."*

Comment: This project will not be the causal factor in future growth patterns. The project is complying with the needs and requirements of previously completed planning for urban development. Similar compliance can be expected of waste water management, solid waste management, fire and police protection, and other County services.

State Plan item: (226-104) Population Growth and Distribution Guidelines

(c) (2) *"Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures."*

Comment: The proposed project is subject to the physical availability of water source development in the subject development areas. Community Plans have been previously completed and these plans did not specifically address the physical availability of adequate water source/supply. Through exploration of other aquifer sources, an adequate supply to meet the future demands of these three Community Plan areas has been found in the Haiku-Paia area. The DWS determined in their EMPLAN that development of this source and transferring the underutilized supply to the three Community Plan areas would comply with the land use policies of the three Plans.

3.2 STATE FUNCTIONAL PLANS

Twelve Functional Plans have been established to help implement the Hawaii State Plan in coordination with the County General Plan and Community Development Plans. The Functional Plans work as the primary guide posts for implementation of the Hawaii State Plan. The Functional Plans pertinent to this project are: Housing Plan; Agricultural Plan; and Water Resources Plan . Some times, competing policy interests are found among the Functional Plans. For example, areas designated for agricultural use may also be considered as prime housing development areas.

3.2.1 State Housing Plan

State Housing Plan item:

Objective A: *" Develop greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, livable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals."*

Comment: The County has endeavored to work with the State as well as private sector residential developers to fulfill this vital component of the State Housing Plan. The Community Plans for the Wailuku-Kahului , Paia-Haiku, and Kihei-Makéna areas provide as a planning guide the

projected population density of 38,900 over the next twenty years. Various Project planning and land use approvals are under County review, with initial construction planned for 1993.

3.2.2 State Agricultural Plan
State Agricultural Plan item:

Objective B: *" Achievement of productive agricultural use of lands most suitable and needed for agriculture."*

Policy (B) (4) *Encourage productive use of the most suitable agricultural lands.*

Policy (B) (5) *Provide greater protection to agricultural lands in accordance with the Hawaii State Constitution.*

Comment: The proposed project alignment will not jeopardize or detract from the Agricultural land uses presently in practice. Alignments will generally be along existing State and County road rights-of-way, and in certain instances, be along private agriculture service roads. Once completed, the existing agricultural use can continue over the pipeline.

3.2.3 State Water Resource Plan
State Water Resource Plan item:

Objective A. *Assure adequate municipal water supplies for planned urban growth.*

Objective E. *Assure availability of adequate water for agriculture.*

Comment: In 1990, under the provisions of Chapter 174C HRS, the State Water Resources Development Plan was abandoned in favor of the State Water Code. The Maui County Water Use and Development Plan is now being updated as part of the continuing water use planning process. The Community Plans for the County of Maui served as the basis for projections of future needs. These Plans are currently being revised and updated. The Water Use and Development Plan can serve as a guide for the evaluation of potential impact of future growth on Maui, and collectively, both the Community Plans and the Water Use and Development Plan will provide guidelines for future planning.

3.3 STATE LAND USE LAW

Under the provisions of the State Land Use Commission Rules, a boundary amendment application is necessary for uses that are non-

-conforming to the land use designation. Under the provisions of Chapter 205, section 4.5 (7), the requirement is waived.

3.4 MAUI COUNTY GENERAL PLAN

The proposed project will implement the objectives and policies of the Maui County General Plan in the following area: Objective IV-Transportation , Objective B. Water, **"1. To provide an adequate supply of potable and irrigation water to meet the needs of Maui County's residents."**

This section will cite the applicable General Plan objective or policy, and then discuss it's applicability to the proposed project.

General Plan Item: Policies:

a. *"Support the improvement of water transmission systems to those areas which historically experience critical water supply problems provided the improvements are consistent with the water priorities and the County's Water Use Development Plan provisions for the applicable community plan area. "*

Comment: The Iao Aquifer has been determined to be very near the upper limits in terms of sustainable yield, and consequently, the exploration of new source wells in the Hamakuapoko area has indicated that potable sources are available to fulfill the mandate of the Community Plans for Kahului-Wailuku , Kihei-Makena, and Paia-Haiku.

General Plan Item: Policies

c. *"Develop improved systems to provide better fire protection."*

Comment: Providing water from East MAUI to the Kahului-Wailuku, Paia-Haiku, and Kihei-Makena Community Plan areas will support fire fighting capabilities by having an adequate source of water.

General Plan item: Policies

d. *"Monitor growth activities throughout Maui County in order that development of new water sources is concurrent with approval of new developments."*

Comment: As new proposed development is being reviewed at the land use policy amendment stages, (State Land Use Commission, County General Plan, and Zoning), new water development can and should maintain contact with the development review process so that development in planned areas does not exceed water supply .

General Plan Item: Policies

e. *" Support the Board of Water Supply in its determination of future water needs consistent with the General Plan, Community Plans and the growth management strategy. "*

Comment: The Board's plans for water source development are subject to agency review at both the State level, (Dept. of Land and Natural Resources), and County level, Planning Dept., and Public Works Dept.

Also, as funding is more clearly identified, the needs for CIP future planning is also emphasized for future budget purposes.

General Plan Item: Policies

g. *"Seek new sources of water by exploration in conjunction with other government agencies."*

Comment: The Department is seeking cooperative efforts with the State DLNR, Division of Water Resource Management, as well as other agencies at the State and Federal levels.

General Plan Item: Policies

h. *" Maintain the right to manage the County's water sources and transmission systems at the County level."*

Comment: The basic principle of home rule is of paramount importance .

General Plan Item: OBJECTIVE: 2. **"To make more efficient use of our ground , surface, and recycled water sources."**

i. *"Develop a method of allocation of water based on community need."*

Comment: This policy is essentially the same policy that has been reviewed and accepted in the Community Plans for future growth, density, and scheduling. The EMPLAN addresses allocation based on community needs.

3.5 COASTAL ZONE MANAGEMENT ACT (CHAPTER 205-A, HRS)

The East Maui Water Development Plan is not located within the special management area or coastal zone management areas and therefore a permit application submittal is not required.

3.6 ENVIRONMENTAL IMPACT STATEMENTS (CHAPTER 343, HRS)

All projects involving State or County lands or money are required to prepare an Environmental Impact Statement under the provisions of Chapter 343, HRS as administered by The Office of Environmental Quality Control. The Department of Water Supply determined that this project due to its' long range schedule, would require an EIS.

CHAPTER IV

IMPACTS ON THE PHYSICAL ENVIRONMENT

This chapter describes elements of the physical environment in which the proposed EMPLAN will be situated. After a brief description, each element is discussed in terms of probable impact (where appropriate) both to and from the proposed development. In certain cases, impacts are distinguished as: 1) *Short-term impacts* , confined primarily to the construction period; 2) *Long-term impacts* , that occur while the development is operational or represent irreversible impacts; or 3) *Cumulative impacts* , resulting from the combined effects of developing the EMPLAN. Measures to mitigate probable adverse impacts are proposed where appropriate.

4.1 CLIMATE

Average annual rainfall varies from 20 inches to 90 inches per year along the proposed Kaheka Route alignment. The lower elevations near Kahului-Wailuku average between 20-40 inches annually; the Paia-Hamakuapoko area averages 25 to 40 inches annually; and the Makawao area averages between 60-90 inches annually. U.S. Dept. of Agriculture, Soil Conservation Service , "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai. Aug.1972. Approximately two thirds of the rainfall occurs between November and March of a typical year. Northeast tradewinds occur more than 8 months out of the year, but are the most consistent between April and October. Average daily wind speeds range from 10-20 miles per hour. Kona winds from the south and south-east, are experienced about three months each year, mostly during the winter months. As elevations increase, temperature levels and solar radiation decrease.

4.2 SURROUNDING / ADJACENT LAND USES

Existing land uses on the recommended Kaheka Route alignment are primarily agricultural, with Sugar and Pineapple the dominant crops on the route. The land uses at the higher elevations of the alignment are smaller individual farm operations that consist of dairy, truck farms, flower/ ornamental landscaping materials, and other rural agricultural activities. Sugar consists of 49% of the adjacent land uses, with Pineapple second at 2% . In describing the alignment by phase, it is noted that each phase description identifies location of the phased section by physical landmark, or road right-of-way. The Plan is designed to develop sources nearest the Central Maui Service Area (Hamakuapoko) and develop eastward. Phasing of the transmission pipelines is planned to proceed in a westerly direction ending with a connection to the existing Central Maui

Water Transmission Main. At the end of each pipeline phase, an interconnection to the Central Maui Water System is proposed. The following phase sequences describe the proposed schedule for design, construction, and connection. Figure 1 shows a plan view of the EMPLAN.

4.2.1 **Phase 1:** From the Hamakuapoko Wells, the route will go to Baldwin Avenue, then from Baldwin Avenue to Sunnyside Road, a 16" pipeline connection running from Sunnyside Road along Kailua Gulch and Hana Highway, connecting to an existing 12" waterline near the Maui Country Club.

4.2.2 **Phase 2:** From Sunnyside Road to Haleakala Highway with a connecting pipeline continuing to the Kahului Airport area. This phase also involves the development of two additional wells in the Haiku area, and extending the transmission main route across Maliko Gulch.

4.2.3 **Phase 3:** Will construct two more wells in the Haiku area and connect these wells to the Phase 2 wells. The transmission main would be extended from the Haleakala Highway running along Hana Highway and Hansen Road to Kahului Town.

4.2.4 **Phases 4,5,6:** The balance of the phases, (4, 5, 6) involve adding four more wells and extending the pipeline to these wells and making the pipeline connection to the Central Maui Transmission Line.

Intermediate connections to the Central Maui Water System between Hamakuapoko and the Central Maui Water Transmission Pipeline are planned at Paia, Haleakala Highway, and Puunene. These intermediate connections allow for phased construction of the transmission pipeline. In order to hydraulically connect the proposed East Maui Transmission Line directly to the existing Central Maui Transmission Line, a 4.0 million gallon (MG) pressure break/supply tank (Baldwin 560 Reservoir) is proposed near the intersection of Holomua Road and Baldwin Avenue. The reservoir will act as a pressure break, storage, and flow-through reservoir. As such, it will not be subject to possible stagnation, loss of chlorine residual and undesirable bacterial growth. Figure 3 is a conceptual reservoir site plan.

During this Plan review period, the locations shown on the various graphic figures are not site specific, but are shown in general locations without detail. The exact route should be determined during the design phase of the Project.

4.3 EXISTING IMPROVEMENTS

4.3.1 Existing Condition

With the exception of the two wells already drilled, site conditions along the alignment route are unchanged. All existing uses still prevail and have not been altered pending the completion of this environmental disclosure document and approval of the EMPLAN by the Board of Water Supply.

4.3.2 Probable Impacts

The EMPLAN project alignment will be developed in close coordination with the Department of Public Works, State Department of Transportation, Highways Division, and affected landowners. There will be short term construction related impacts to the ambient air and noise standards due to excavation, use of heavy equipment machinery for well drilling and the trenching and placement of the transmission pipeline.
Traffic will be impacted by the proposed alignment work, particularly along the highways and roads that are heavily traveled during the work day. The Contractor will have to provide the County a traffic management plan to accommodate the anticipated traffic tie-ups that may occur due to this work. For the portion of the work in the agricultural fields, the coordination with the sugar and pineapple operations will need to be closely monitored so as not to unduly interfere with harvesting or field maintenance operations.
The proposed crossing at Maliko Gulch will be the most challenging from a construction perspective and also from an adverse impact potential. At present , the construction of the crossing is planned as follows:
The pipeline along the slopes of the gulch is expected to be constructed on the surface . The pipe will be strapped to a concrete pad on the sides of the gulch. The concrete will be firmly established into the side walls with anchors drilled into the hard basalt. Preliminary site investigation of the gulch reveals a hard layer essentially vertical from approximately 150 to 200 feet below the top. Above that hard layer extensive geological investigation will be necessary to design proper support. Archaeological studies conducted at the point of crossing have provided data on the alignment location and if necessary, the pipeline alignment can be adjusted to accommodate any significant archeological sites or finds. (See **Exhibit A.**)
Finally, there will also be impacts to the various utilities that share existing road rights-of-way, i.e. electrical, sewer, telephone, water, and drainage. Construction standards for the placement of the water transmission lines have been established by the Department as Water System Standards Vol.1 & 2 (reference 5 in EMPLAN.)

1. Minimum cover for water mains 8-inch and larger is 3.0 feet.

2. Type and classes of Water Mains:
   Ductile Iron, Class 52
   Concrete cylinder Pipe, Class 150 or Class 250
3. Wherever the main crosses under a stream bed or structure constituting a potential hazard to the main or where the main is considered inaccessible, the main shall be jacketed. Necessary measures shall be taken to protect the stream embankment from erosion at the points of crossing.
4. main valves shall be installed with the water transmission main so that the maximum distance between valves shall not exceed 2000 feet for mains 16-inch and larger. Main valves on water distribution mains shall be spaced not more than 750 feet in residential agriculture and agricultural areas and 500 feet for all other areas.
5. Butterfly of bevel geared valves shall be used on water mains 16-inch and larger. Gate valves shall be used on water mains 12-inches and smaller.
6. Manholes shall be constructed for butterfly valves.

4.3.3 Mitigating Measures

The Department can mitigate adverse impacts due to traffic congestion by scheduling construction to take place along high traffic volume corridors after peak AM and PM travel times. Also, as a standard condition, the Contractor will be responsible for providing traffic control personnel to keep the traffic flow smooth and even.

Construction taking place in agricultural areas, i.e. sugar and pineapple fields, will need to coordinate work schedules with the agricultural operators so as not to unduly interfere with the field operations. This will be done by scheduling the construction operations during time periods when the agricultural field operations are not on full schedule and/or work at the other phases of the total alignment which do not interfere with agricultural field activities.

Construction activity in Maliko Gulch will need to monitored closely with emphasis on the cultural and historical impacts that may prevail on the crossing alignment. As stated previously, an adjustment of the crossing alignment can be made to avoid impacting a significant historical or archaeological find.

For the proposed reservoir sites, the State Historic Sites Preservation Division, Department of Land and Natural Resources has recommended that all sites be investigated for historic and cultural sites, prior to construction. This can be accommodated at the pre-design stage when various locations will be reviewed for final selection.

4.4 Physical Hazards

The Maliko Gulch crossing presents the most significant physically demanding and challenging hazard in terms of construction. The crossing is expected to be located within 500 yards mauka of the Lowrie Ditch siphon. In this area, the gulch lower rim varies from 580 feet mean sea level (MSL) to 650 feet MSL; the bottom varies from 280 feet MSL to 350 feet MSL. Trenching down the slopes was not considered feasible due to the difficulty of the terrain and the tremendous loss of agricultural lands that would be needed to provide workable slopes. The final crossing location will be determined and selection made based on the archaeological studies, foundation investigation and engineering principles. For the balance of the EMPLAN alignment, the use of rights-of-way on existing roads (State, County, and private agricultural service roads) provides a stable terrain that will permit installation and also the efficient maintenance of the alignment after installation is completed. Other gulches, well sites, and reservoir locations will be designed to meet the physical terrain features of their respective sites with a minimum of adverse impacts to the sites.

4.5 Topography

4.5.1 Existing Conditions

The EMPLAN alignment topography is in relatively moderate terrain for the major part of the alignment, . The adverse terrain features are in areas where site specific or physical requirements are a consideration. These would include the following criteria: the ability to withdraw water from an aquifer; cross a major terrain feature such as a gulch; and site a reservoir adjacent to a well field. Topographical surveys for the alignment have not been conducted at this stage of the EMPLAN. It is anticipated that this construction detail will be performed during the final design drawings prior to building permit review and approval.

4.5.2 Probable Impacts

Alteration to the terrain features for the EMPLAN alignment will be for the most part of minor significance. This is due to the fact that the major part of the proposed alignment is to be placed along existing roadways and agricultural service roads. Also, where the alignment will cross over agricultural fields, the terrain is level to moderately sloping. Typical trenching for pipeline installation will be to a depth of 6-8 feet which would permit the placement and covering of the 36" pipe with cover material approximately 3-5 feet. In the agricultural fields where active cultivation will be continuing, the depth of cover material would be 5-6 feet.

The major terrain factor will be at the major gulch crossing (Maliko Gulch) and where the storage reservoirs will be sited in proximity to the well fields. At these critical points of terrain alteration, there will be noticeable change to the terrain features due to the construction methodology to be employed for the installation of the pipeline. Soil investigations to determine design conditions will be necessary at the Maliko Gulch crossing site. Preliminary investigation of the gulch in this area reveals a hard layer essentially vertical from approximately 150 to 200 feet below the top. Anchoring below that layer will generally be done on the detritus slope. Above that hard layer extensive geological investigation will be necessary to design proper support.

4.6 Soils and Agricultural Potential

4.6.1 Existing Conditions

The soils in the EMPLAN alignment consist primarily of material from weathered igneous rock. The major portion of the alignment lies between 80 and 700 feet above sea level and contains a variety of soils in the following series. *Haliimaile Series; Molokai Series; Paia Series; Haiku Series; Pulehu Series; Puuone Sand; Rough Broken Land; ; and Waiakoa Series.* As stated in earlier chapters of this document, the primary alignment design concept calls for the major portion of the alignment to be placed on the roadways and/or agricultural service road rights-of-way. In this sense, the alteration to existing terrain features of roadways and the impacts to soil types is not considered a major or significant impact consideration. The Department has established construction - building standards for pipeline placement, storage reservoir and pump station site improvements, and other facility improvements. Soil studies will in all probability not be a requirement for the pipeline placement work on existing State and County roadways; in the agricultural field areas, the service roads will also be examined in terms of use patterns and soil types. The soil will be examined at the Maliko Gulch Crossing, the various reservoir locations, and other proposed improvements that the Department deems necessary.

4.6.2 Agricultural Lands of Importance to the State of Hawaii (ALISH)

The ALISH maps are the State's means of classifying the agricultural land resources. For purposes of this document, the portions of the proposed alignment that will in fact use the agricultural lands in the Paia-Haiku areas, will be in lands classified by the State as "Prime". As defined by the ALISH maps, "Prime lands have the soil quality, growing season, and moisture supply needed to produce a sustained yield of crops economically when treated and managed according to modern farming methods." The acreage that is anticipated to be taken is 115 acres including roads, etc. Once the water line is constructed, most of the land can revert back to it's original use. This will be finalized when the recommended alignment has been finalized and site specific drawings are completed.

4.6.3 Probable Impacts

The loss or withdrawal of the agricultural lands for use in the EMPLAN project is estimated to be approximately 5 acres. In terms of economic loss, the acreage in question is not expected to be of major significance to the economy of the County or the State's agricultural productivity. The Department will be monitoring the design phase of the EMPLAN, with particular attention to the taking of private agricultural lands. As the various phases are initiated, completed, and placed into service, the demand and consumption for projected growth becomes of vital importance to future taking of private lands.

4.7 Hydrology

The proposed EMPLAN is to withdraw adequate quantities of potable water from the Paia basal aquifer. The development of East Maui sources began with the drilling and testing of two wells west of Maliko Gulch in the Paia Aquifer. These test wells are capable of providing pump capacities of between 0.75 to 2.0 million gallons per day (MGD) each. Subsequently, additional wells are to be located and developed east of Maliko Gulch in the Haiku basal aquifer which lies primarily within the northeast rift zone of East Maui. Exploratory drilling is expected to proceed incrementally eastward towards an increasingly water rich area. A total of eleven exploratory wells are estimated to be drilled and tested at an elevation of approximately 700 ' mean sea level. (MSL). These eleven preliminary planned wells supersede`an earlier conceptual plan that suggested a total of 28 wells might be needed to supply 14 MGD. This previous estimate of 28 wells was based on locating the wells closer to the ocean between the elevations of 200 and 500 ' MSL, where pump capacities of only 0.5 MGD per well could be expected from a thinner portion of the basal aquifer.

4.7.1 Existing Conditions

At the present time, the water sources in the Paia-Haiku area consist primarily of limited well sources and surface water. Demand is essentially for the rural and agricultural consumer in the East Maui communities of Haiku, Kula, Makawao, and Paia. Major agricultural water users such as Sugar and Pineapple also take water from existing sources in this area. Current water withdrawal rate for current consumers is estimated at 17 MGD.

4.7.2 Proposed Development

a. Hydrogeological background

The hydrogeology of the Paia and Haiku aquifers has been studied and reported in the Central Maui Water Study, Part II, prepared for the Maui Department of Water Supply by Norman Saito Engineering Consultants, Inc. (February, 1991).

This report describes the Paia Aquifer as a thin basal lens with a mauka to makai water table gradient of 1.6 ft./mile, based upon a reported head of 4.3 feet in the upper Haiku well. The sustainable yield of the Paia aquifer has been estimated at 2-3 MGD.

The Haiku aquifer lies mostly within a 2.7 mile wide rift zone defined by two separate alignments of volcanic vents. Although no surface exposures have been discovered, associated dikes with a northwesterly trend presumably occur beneath these two alignments and if so, may have an influence on ground water conditions and direction of flow. However, evidence of any ground water conditions affected by dikes in the rift zone must await further exploratory drilling. Reported heads of 3.4 feet in the Haiku School well and 5.0 feet in the Baldwin Manor well indicate a higher water table gradient in the Haiku aquifer than in the Paia aquifer which in turn suggests greater ground water recharge as would be expected in a higher rainfall area. A sustainable yield of 15 MGD has been estimated for the Haiku aquifer which extends from Maliko Gulch eastward along the coast towards Kakipi Gulch, a distance of about 5.5 miles. At the present time, the Haiku School and Baldwin Manor wells are the only wells which tap the Haiku basal aquifer.

b. EMPLAN

The EMPLAN proposes to move eastward to establish an alignment of pumping centers that can provide increased yield of potable quality water. This planned development is based on the assumed existence of a thicker basal lens that results from higher rainfall incidence in the eastern sectors of the aquifer, and geological conditions similar to those experienced to date. Confirmation of these assumptions will be made when the exploratory wells are drilled in the proposed locations. The criteria for the location and design of the well fields are as follows:

* Sites to be located approximately two miles inland from coast.
* Sites to be spaced approximately 2,000 feet apart.
* Sites to be located at an elevation of approximately 700 feet.
* Wells to have anticipated pump capacities of one to two MGD each.
* Wells to be cased and tested at a depth of -30 ft. MSL, before drilling any open hole. Maximum open hole depth of -60 ft. MSL (if required by field conditions.)
* Sites to located along existing road or highway rights-of-way.

4.7.3 Probable Impacts

The EMPLAN anticipates developing the Haiku basal aquifer which lies near sea level several hundred feet or more below the ground, surface water streams and diversions, and scattered high-level, ephemeral perched ground water sources. The wells will be located at an elevation of approximately 700 feet and are expected to encounter approximately 150 to 200 feet of moderately permeable andesitic Kula lavas before encountering permeable basaltic Honomanu lavas. A few of the wells may encounter small quantities of high-level ground water perched on scattered impermeable layers in the capping Kula lavas. These perched ground water sources typically yield only small quantities of water because of their limited extent and recharge and, consequently, are not suitable as municipal sources of supply.

The probable impacts that can be anticipated would be if high-level perched water is encountered during drilling of a well, it will temporarily drain downward in the drill hole into the underlying permeable Honomanu basalt formations. However, when completed, each well will be cased with solid steel casing from the ground surface to sea level elevation and the annular space between the casing and the drill hole will be grouted with cement, sealing off any high-level perched ground water, protecting the well from surface contamination and permitting only basal ground water to be developed.

4.7.4 Mitigative Measures

The EMPLAN proposes to develop basal ground water in the Haiku area and will not affect existing wells because all of them (except the Hokoana Well and the Baldwin Manor well) tap and develop high-level perched ground water located above the basal ground water lens.

The development of well sources will proceed incrementally. Based upon careful analysis of pumping tests and actual pumpage data obtained as each well is drilled and placed into service, the estimated sustainable yield of 15 MGD (Central Maui Water Study, Part II) to 31 MGD (Commission on Water Resource Management, Water Resources Protection Plan, 1990, will become more precisely known. Consequently, the planned development of some 16 MGD maximum capacity with no adverse impact on the Haiku basal aquifer and its sustainable yield. Basal ground water which currently is wasted into the ocean as underflow in the basalt formations offshore will be intercepted by wells located inland at the 700 foot elevation and put to beneficial use as municipal water supply.

4.8 Flora and Fauna

4.8.1 Flora

The major part of the EMPLAN alignment is proposed for installation along existing State and County roadways, agricultural service roads, or on locations off the agricultural service roads. This is due primarily to the

need to have unimpeded access for service and maintenance in the unlikely event of breakdown or damage to the pump equipment, or pipeline. The exception is the major gulch crossing at Maliko Gulch. Most of the proposed alignment has been in either Sugar or Pineapple cultivation for an extended period, and as a result, other plant species are rare, or consist of weedy species. These weedy species are primarily alongside the roads and in the cultivated fields, and they are primarily grasses. In the gulch areas and off the agricultural service roads, the mixed forest type of flora consisted of a mixture of introduced tree species such as Eucalyptus spp., silk oak Grevillea robusta, varieties of guava, Java Plum, and native tree species such as Ohi'a (Metrosideros collina ssp. polymorpha), and Koa (Acacia koa). No rare, threatened, or endangered plant are located in the basic pipeline alignment, and the native species found in the gulch perimeter area will not be affected by the crossing. There are representations of these native species throughout the Hawaiian Islands in similar types of habitat.

4.8.1.2 Fauna

The introduced vegetation which has established itself on the proposed alignment and the high use factor of road traffic do not provide adequate habitat suitable for any of the endemic species of birds or mammals. The one exception again will be the gulch crossing at Maliko Gulch. The daily patterns of the Hawaiian Hawk or Hawaiian Owl would be to pass through the semi-forested area of the gulch in search of food, companionship, or on their way to a different sector of the upland mountains. The introduced species of avifauna and mammals are typical of urban-agricultural areas. These would include the Indian Mynah; common gray dove; the barred or spotted dove; Kentucky cardinal; English sparrow, and the most recently introduced bird species, the red vented bulbul. The rodents seen or most likely to exist would be the roof rat, and Indian mongoose. *It is highly unlikely that any endangered bird or mammal species will be observed in the project's alignment, because a major portion of the alignment has been greatly disturbed and modified.*

4.8.1.3 Aquatic Resources

Concerns on the potentially adverse impacts to existing streams and high level water endowed areas due to the well drilling have been reviewed by **Water Resources Associates**, an Honolulu based consultant. Their response to the questions of potential impacts to rivers, streams, and other sources of high level water were primarily that there would be little concern. The drilling of wells at the 700 foot elevation would be to reach the fresh basal water lens and pump from the aquifer directly. The well would be cased and grouted with cement from the ground surface to the basal aquifer. This would insure that no percolating, or perched ground water, or streams flows would be affected. **(See Figure 4)**

4.9 Noise

4.9.1 Existing Conditions

Existing noise levels vary significantly within or along the project alignment. Existing traffic noise levels along the Hana Highway would be in the typical noise level ranges of 65 Ldn to 70 Ldn. There are no sound attenuation berms or barriers on the Hana Highway and therefore, the predictable levels from the centerline of the highway could be higher during peak travel time. Similarly, the agricultural service roads can experience abnormally high noise levels during peak harvest time when cane haul trucks are moving harvested cane to the Puunene Mill for processing. In normal times, the occasional service pickup truck will not result in high noise level readings. The relative isolation of the agricultural fields from established urban sectors and the historic acceptance of the industry practices have resulted in minimal complaints about vehicular noise.

4.9.1.1 Non-Traffic Noise

The proposed project will have during the construction phase, the short-term construction related noise of the equipment used for the trenching; the material carriers bringing pipe to the section of the alignment being placed; and the equipment used to place the pipe in the trench. Other constructed related noise sources would be the well drilling and drilling at the gulch crossing if it felt that anchor placements will require pre-drilling. All these sources will cease upon construction completion. Most of the noise will take place only during actual construction.

4.9.2 Traffic related Noise

A predictable increase in traffic related noise levels can be anticipated, particularly during the phases of work on highly traveled segments of Hana Highway, Baldwin Avenue, and other State and County roadways. These will be of predictable duration and under the State Department of Health Community Noise RegulationsThe general contractors will have to comply with noise abatement devices on their construction equipment, i.e. mufflers on exhausts, avoid "gunning" machinery, and other measures to minimize noise impacts in areas of close proximity to urban-residential sectors.

4.10 AIR QUALITY

4.10.1 Existing Conditions

Present air quality in the proposed project alignment is considered to be very good. Long term monitoring stations at Kihei and Lahaina maintained by the State Department of Health have consistently recorded airborne particulates and sulfur dioxide levels that are within allowable State of Hawaii Air Quality Standards (AQS). However, particulates and carbon dioxide emissions from nearby sugar cane fires do present potential degradation to the air quality in the project area. Also, the

fugitive dust during clearing of the burned cane in the harvest process create temporary exclusions of the AQS.

4.10.2 Probable Impact

Direct impacts will result during the temporary construction phase for this proposed project. The principal generator of fugitive dust will be the construction equipment that is involved in the trenching of the pipeline alignment. This can be abated or mitigated by proper construction pollution control methods, i.e. watering the alignment under construction, and also keeping the work schedule within the normal working hours of 7:00 a.m. to 3:30 p.m. Another construction related impact to the ambient air quality will be the vehicular traffic that may be delayed on the roads being used for the pipeline placement. Increased emissions of carbon monoxide and nitrogen dioxide can be anticipated from the delays on the segment of roadway being worked. The use of traffic police to maintain a steady flow of traffic movement can abate the delays and reduce the emission levels to within the AQS. If undue delays are experienced, it will result in temporary exclusions of the State AQS at that location.

4.11 SCENIC AND AESTHETIC RESOURCES

4.11.1 Existing Conditions

The proposed EMPLAN alignment will employ the State, County or agricultural roadways and the scenic vistas or aesthetic values will be impacted during the construction phase. Upon completion of the pipeline installation, the current or existing views of roads and agricultural fields will remain uninterrupted. The Maliko Gulch crossing may be visually impacted with the placement of the pipeline and the foundation works used to secure the pipe in place, but the relative isolation of the crossing site will not be of significant impact to the general public since only service maintenance workers and occasional hunters will see the pipeline after construction is completed. The storage reservoirs will also present some visual or aesthetic concerns; the Department may consider using earth tones or green colors blending with the surroundings to mitigate this potential problem.

4.12 HISTORICAL AND ARCHAEOLOGICAL SITES

4.12.1 Existing Conditions

The archaeological consulting firm of Aki Sinoto Consulting conducted a field survey of the Maliko Gulch area and a literature search in June, 1992. The fieldwork involved a walk-through of the Gulch perimeter, and also at the bottom of the Gulch. The steepness of the side slopes precluded any site investigations and it was considered unlikely that any site or finds of significance would be there due to the terrain conditions. Exhibit A is attached as the report on their findings.

CHAPTER V.

SOCIO-ECONOMIC IMPACTS

This Chapter discusses the socio-economic impact of the proposed EMPLAN project with respect to the economy, employment, and land uses along the EMPLAN alignment.

5.1 PRESENT LAND USE

The EMPLAN is influenced by the Paia-Haiku Community Development Plan in the East, the Kihei-Makena Community Development Plan in the South, and the Kahului-Wailuku Community Development Plan in the North-West. In these three Plan areas, the blending of Agriculture with Urban uses, i.e. residential, resort, and commercial, has resulted in the established patterns of development taking place in close proximity to employment centers. The single exception to this conclusion is the commuting patterns that resort employees to the West Maui destination resorts of Kaanapali and Kapalua take daily from Central Maui residential districts. Also, the commuter patterns to resort areas in Kihei-Makena are becoming more strongly established. The largest acreage still remains in Sugar, with Pineapple in second place. The Urban designated lands in the three Community Development Plans will not be adversely impacted by the EMPLAN; the potential land use impacts will take place within the Agricultural District at the higher elevations where the rainfall is more prevalent. The Principal purpose in the acquisition of the agricultural lands will be for well sites; storage reservoir locations; agricultural service roads for pipeline installation; and possible taking for easements for pipeline installation across agricultural lands that may be in cultivation. The physical impacts will not be significant since the taking of lands is not severe. Concerns have been expressed by the residents and agricultural communities of Paia-Haiku regarding the taking of this water from their districts. The impacts may be felt more noticeably in the social consciousness of the residents by the movement of water from a water-rich area in the East Maui mountains to the residential, business, and industrial communities of Kahului-Wailuku, and the Resort -Commercial areas in Kihei-Makena. These concerns have been more specifically addressed to the appropriateness of taking the water on the basis that the EMPLAN could affect their ability to retain their continued use of high level water for their diversified agriculture, dairy and cattle operations, plant and nursery farms, and other activities more normally associated with a rural lifestyle that predominates in the Paia-Haiku communities. The technical studies that have been conducted to date have established the extent of water available in the East Maui mountains, and it is on the basis of the hydrological studies that the EMPLAN is proposing the series of well sites to develop and make available the sustained yield of 10 MGD

needed for the three Community Development Plan communities to the year 2012.

5.2 ECONOMY

The economy of the County as a whole will not experience significant change due to the implementation of the EMPLAN. Property tax increases that may attributed to the change in Land Use Boundary amendments, County Development and Zoning changes have already been established by the completed changes in those basic policies. The intent of the EMPLAN is to insure that adequate County services, potable water, will be available for those users of the improved lands. Funding for these proposed improvements is scheduled to come from the Department of Water Supply through the assessment of connection fees similar to those that have been charged over the past twenty years .

5.3 EMPLOYMENT

The EMPLAN will provide a significant contribution to the construction industry which is experiencing a downward trend in activity. The anticipated benefits to the State and Maui County from the projected construction of almost $50million dollars based on the full development of the EMPLAN will be a boost to the Maui economy. It is anticipated that if fully implemented, the EMPLAN will require 30 construction workers for fifteen years, and contribute $20.0 million dollars of payroll that will be taxed by State and County.

5.3.1 PROBABLE IMPACTS

No reductions in agricultural employment is anticipated due to the implementation of the EMPLAN. The relatively minor taking of agricultural lands for well sites and storage reservoir sites will not adversely impact the two major agricultural activities of Sugar and Pineapple. The continuous policy of the Department is to practice conservation of potable quality water and attempt to feasibly develop alternative sources for agricultural and other non-potable requirements, i.e. fire protection, construction, industrial uses, landscaping irrigation, etc.

CHAPTER VI.

IMPACTS ON PUBLIC FACILITIES AND SERVICES

This Chapter describes the existing conditions of public facilities, utilities and services in the three Community Development Plan Areas and the relationship of these systems to the proposed EMPLAN. Public facilities are those systems which are provided , staffed, and maintained by government to serve the public health, safety, and welfare. They include roadways, fire and police protection, refuse collection and disposal, parks and recreation, and water supply. Public utilities are distributed services, such as electricity, wastewater treatment and disposal, and communications. These services are provided either by a public agency directly, or by a publicly regulated utility. In the implementation of the EMPLAN, two categories of public facilities will be impacted by the proposed project ; they are **Transportation and Fire Protection.**

6.1 TRANSPORTATION FACILITIES

6.1.1 Existing Conditions

Primary development of the EMPLAN will utilize State and County roadway rights-of-way wherever practicable. The intent of the plan is to limit the impacts of both the construction and the maintenance of the pipeline alignment. Also, the EMPLAN will maintain cost controls by the use of agricultural service roads and other off-road sites for the well sites and reservoir locations. By so doing, the Department will be able to develop facilities that will be out of the public eye and also away from possible damage and or contamination. In previous chapters, the general phased alignments have been identified. Decisions as to the actual alignment will not be made until the Board of Water Supply has had the opportunity to examine the entire EMPLAN in its' relationship to the Central Maui Water Development Plan. This will insure that the affected communities in the three community development plan areas will have ample opportunity to express their specific concerns and positions relative to the EMPLAN.

6.1.2 ACCESS IMPROVEMENTS

All proposed facility improvements required for the EMPLAN, (well sites, storage reservoir sites, major gulch crossings, and pipeline installations), will require easements for perpetual access for repair and maintenance. All proposed access roads, site improvements, and associated uses will be improved and maintained at County expense. Land acquisition if required on privately held lands, will be subject to negotiated purchase at fair market values to be established and approved by the Board of Water Supply. Easement rights on State, County, or agricultural service roads will also be negotiated and approved by the Board of Water Supply with the appropriate agency or private entity affected by the easement request. Pending the final alignment determination, the

programmed plan of land acquisition will initially involve the two exploratory wells that are under construction. The design and construction of the storage reservoirs are under way, and the initial alignment that is identified as Phase 1 in the EMPLAN will be reviewed by Department staff .

6.1.3 PROBABLE IMPACTS - LOCAL IMPLICATIONS

The implementation of the EMPLAN will not result in significant adverse physical impacts at the outset. The physical implications of well drilling and reservoir construction are not considered significant activities in terms of impacts to ambient Air and Noise standards. In addition, the activities will be taking place in relatively isolated locations that are away from established urban/residential or commercial zones. Pipeline installation will have more significantly adverse impacts to the Air and Noise standards since the activity will be taking place on established transportation arterials. Traffic patterns will be affected as construction activities may require lane closures, or diverting of established traffic flows to achieve the installation of the pipeline and other ancillary and support components of the pipeline. The contractor will be required to post traffic safety advisories in the media to keep the motoring public aware of future construction on major traffic arterials. Also, the onsite construction activities will require traffic security to maintain the flow of traffic in as smooth a condition as practicable. Work scheduling can also be a vital segment of maintaining traffic flow patterns. This would include later start time and earlier closing time to permit the use of all existing roadway lanes during peak traffic hours. This will be subject to review by the Department and the contractors to determine if costs will be controlled on a longer schedule, or with more work scheduled during off-peak traffic time. Work that is not located within the established traffic patterns can be scheduled ahead so that various phases of the EMPLAN can tie together separately, albeit not in a continuous pattern.

6.1.4 PROBABLE IMPACTS - REGIONAL IMPLICATIONS

The regional implications that the EMPLAN will have on County transportation facilities are remote. The scope of the total project is at once expansive, but also limited. This is due to the nature of the EMPLAN which is designed to seek and provide potable water in sufficient quantities to meet the long term future demands as identified in the Community Development Plans. It can be assumed that as exploration provides sustainable yields, the pipeline portion of the work schedule can proceed on a more accelerated pace. This could also result in either more impacts to the traffic flow patterns, but also could result in a quicker resolution to the projected congestion. It is concluded that traffic impacts will remain essentially localized

6.2 FIRE PROTECTION

Fire Protection is the only other County service that would be impacted to a significant extent with the implementation of the EMPLAN. Design planning to provide water to future planned urban land uses, i.e. residential, resort, commercial, and industrial must also include fire protection. The balance of County services essential to the advent of planned urbanization can proceed on a more reduced pace, since the onsite activities of the urbanization will provide a clearer picture only after the physical improvements have been reviewed and approved by the Planning, Public Works, Police, and other County agencies. For the actual physical improvements required in the EMPLAN, once the construction has been completed, the Department will be responsible for the daily operations and the periodic maintenance of the facilities.

CHAPTER VII

ALTERNATIVES TO THE PROPOSED ACTION

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17 (f)) requires a discussion of " any known alternatives . . . which could feasibly attain the objectives of the action." The rules further specify that the alternatives be explored and evaluated in light of enhancement to environmental quality or the avoidance of adverse environmental effects.

Variations of two alternatives are examined in this section: (1) the alternative of no action or of postponing action pending further study; and (2) alternatives related to different designs, sources, or methodologies of the proposed action which would present different environmental impacts.

7.1 NO ACTION ALTERNATIVE

The No Action alternative, or its' variant, postponement of action, would preserve the EMPLAN alignment and the various potential well and reservoir sites in their present state. A discussion on the advantages and disadvantages of the No Action alternative is provided in the following:

Advantages

* No further planning or design work time and charges would be required to continue the efforts of the EMPLAN project.

* All current or existing agricultural operations along the selected alignment would continue without potential loss or interruption due to the EMPLAN phasing schedule of construction.

* No Action or further postponement of the EMPLAN would maintain the Haiku Aquifer in its' present condition, without the planned withdrawal of the basal aquifer water for Central Maui use.

* Potential vehicular congestion on the State and/or County roadway alignments selected for the EMPLAN would be relieved of the short-term traffic tie-ups due to the proposed construction activity.

Disadvantages

* The three Community Development Plan areas for the communities of Wailuku-Kahului, Kihei-Makena, and Paia-Haiku would not be provided with their supply of potable water. This could delay or abort their Urban planned growth through the year 2012.

* Economic growth as planned by the County Administration and approved by the County Council would experience a potentially severe setback in terms of housing availability and construction related employment, as well as associated impacts to suppliers, vendors, and support services for the Resort and Commercial projects that would have been developed.

The affected Community Development Plans are in their 10 year review period and the decisions to alter the previously approved Plans are under review. The EMPLAN is of a longer planning duration since the implementation of a program to develop adequate or sustainable yield of potable water is both time consuming and technically demanding. Exploratory wells are necessary to determine both quantity and quality of available water that will meet Department standards for potable quality.

* Individual water use is increasing; even with no new sources and no additional persons, the Iao Aquifer will not be adequate.

7.2 ALTERNATIVE SOURCE CONSIDERATIONS

The Department has considered various alternatives of source development , the use of non-potable quality water with pre-treatment, water conservation programs, and non-potable water for non-potable uses. Briefly, these are as follows:

a. Developing the Waihee Aquifer - The estimated cost of developing this aquifer was $18.6 million (1990 dollars). The sustainable yield value is commonly taken to be 8.0 MGD; however, the practical developable limit has not been demonstrated by experience. 4 MGD is a comfortable estimate, and reliance on more water than the projected 4 MGD would require field demonstration. Also, the 4 MGD will not be sufficient to provide the quantity of water needed over the planning period for the Community Development Plans.

b. Desalination - The 1992 Water Use Plan suggests that the costs to design and build a 1MGD facility would be $2.5million and the attendant Operations/Maintenance costs would be approximately $2.30/1000 gallons of raw water with 800 mg/l chloride content (brackish water). In addition, the daily disposal of the resulting brine with the resulting environmental problems make alternative source development more feasible and practical.

c. Surface Water - The planned use of surface water for potable purposes is not considered as cost effective or socially redeeming since the costs for pre-treatment though less than desalination, are still of high.

The social unacceptability of taking this water from agricultural users is not a high priority consideration for the Department. Planned sharing of basal aquifer sources is more equitable.

d. Outside Water - Analysis of water consumption in the Kihei district indicates that this area has a higher than average consumption of water that is used for purposes other than normal household purposes. It is estimated that at the present time, more than 4.8MGD, or approximately 70% of the total water used is used as outside water. The use of water other than potable quality water is recommended in a conservation directed method. However, the reduction of potable water use as outside water would still not overcome the need to develop new water sources.

e. Water Conservation - The DWS is proposing to implement a public awareness program regarding water conservation. The reduction of water use anticipated from this program has not been determined, and the development of new sources will still be programmed.

7.3 ALIGNMENT ALTERNATIVES

The EMPLAN considered various alignment alternatives in the design engineering and economic analysis review process. The final alignment selected was made on the basis of least environmental impacts, tempered by economic cost factors.

7.4 ANALYSIS AND CONCLUSIONS

The EIS rules concerning " rigorous exploration and objective evaluation" of feasible alternatives have been applied in this chapter. The " No Action" or postponement alternative would preserve the existing conditions along the proposed alignment route, in addition to the well and reservoir sites. This alternative will not resolve the planned demand for potable water in the three Community Development Plan areas planned for expansion and development by the year 2012. The various alternatives identified as a through e in 7.2 would also not provide in adequate quantity or questionable quality, the demanded volume for the year 2012.

In conclusion, the Department has evaluated the alternative proposals and finds that the proposed EMPLAN and the recommended alignment will be in the County's best interest. The greatest public benefit is the Department's goal in developing and transporting this water from East Maui to Central Maui.

CHAPTER VIII

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17 (k)) requires the " identification of unavoidable impacts and the extent to which the action makes use of non-renewable resources during the phases of the action, or irreversibly curtails the range of potential uses of the environment. . . ."

The long term programmed plan for the EMPLAN will permanently commit money, time, labor and physical resources. The decision to develop adequate water source and transport this water for use in the Central Maui Water System is a planned direction that is unlikely to be reversed. The other unavoidable impacts include the temporary traffic congestion that may result due to construction related activities on the roadway systems; the potential impacts to high level water by the exploratory well drilling; and finally, the transport of the water resource to meet urban demands. These commitments should be evaluated in light of planning directions that have been established by the Administration and executed by the Legislative branch of County government, the County Council.

CHAPTER IX

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17(j)) requires a brief discussion of the "extent to which the proposed action involves trade-offs between short-term losses and long term losses or vice versa, and a discussion of the extent to which the proposed action forecloses future options, narrows the range of beneficial uses of the environment, or poses long term risks to health or safety. . . "

As discussed in previous chapters, the proposed action will provide potable water from a water rich area of Maui for use by Maui County in fulfilling its obligated role as the Department of Water Supply. This action will not adversely impact the State's long-term agricultural economy or levels of productivity. No short-term exploitation of physical resources that will have long term consequences has been identified during the design and review stage of the EMPLAN. There are no known long-term risks to public health and safety which would occur as a result of this project's implementation. In the unlikely event that conclusive evidence was presented or discovered during the phased construction program, the Department would have the right and obligation to terminate or temporarily cease development until the long term risk had been resolved or eliminated.

CHAPTER X. CONSULTED PARTIES AND COMMENTS RECEIVED

10.1 Consulted Parties

The Environmental Impact Statement Preparation Notice (EISPN) for the proposed East Maui Water Development Plan was published in the OEQC Bulletin on July 8, 1992. The thirty day review period ended on August 7, 1992. In addition, the EISPN was mailed directly to 53 agencies and organizations listed below.

Federal Agencies	Date Comment Received
U.S. Department of Agriculture Soil Conservation Service	8-5-92
U.S.Army Corps of Engineers Pacific Ocean Division	7-30-92
U.S.Department of the Interior Fish & Wildlife Service National Parks Service	
U.S. Department of Commerce Nat'l Marine Fisheries Service	
U.S. Department of Transportation Federal Aviation Administration	
U.S. Geological Survey Water Resources Division	

State Agencies	
Dept. of Accounting & Gen.Svcs.	7-21-92
Department of Agriculture	7-30-92
Dept. of Business ,Econ.Develop.& Tourism	
Department of Defense	7-21-92
Department of Education	9-18-92
Dept. of Hawaiian Home Lands	
Dept. of Land and Natural Resources	8-17-92
State Historic Preservation Division	7-28-92

State Agencies	Date Comment Received
Department of Health Environmental Management Div.	8-19-92
Dept. of Transportation Highways Division	7-24-92
Airports Div. c/o Kahului Airport	
Office of State Planning	8-7-92
Office of Hawaiian Affairs	
University of Hawaii Water Resources Research Center	
Univ. of Hawaii, Environmental Center	
State Land Use Commission	8-5-92
Private Sector/ Community Groups	
American Lung Association	
Alexander & Baldwin, Inc. Ms. Meredith Ching	7-21-92
A & B Properties, Inc.	
C. Brewer Properties, Inc.	
Central Maui SWCD	
Hawaiian Commercial & Sugar Co.	
Maui Electric Company, Ltd.	8-3-92
Maui Land & Pineapple Co.	
Maui Lani Development The Nature Conservancy	
Hui Alanui O Makena (via Isaac Hall)	8-7-92
Sierra Club	
Isaac Davis Hall	8-7-92
Keauhou O Honuaula, Inc. via Isaac Hall	8-7-92
Haiku Community Association	

Kahului Town Association	
Kihei Community Association	
Makawao Community Association	
Makena Homeowners Association	
Paia Main Street Association	
Pukalani Community Association	
Spreckelsville Community Association	
Wail'ea Community Association	
Wailuku Heights Homeowners Assn.	
Wailuku Main Street Association	
Landmark Maui Properties	8-7-92
Maui Tomorrow	8-11-92
Environment Hawaii	7-12-92
Native Hawaiian Advisory Council	8-7-92

<u>Maui County Government</u>

Planning Dept.	7-17-92
Dept. of Parks & Recreation	8-7-92
Dept. of Public Works	
Economic Development Agency	
Maui County Council The Hon. Howard Kihune, Chair	

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P. O. BOX 50004
HONOLULU, HAWAII
96850

August 3, 1992

Mr. Carl K. Takumi, P.E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Takumi:

Subject: East Maui Source Development Project Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan

We have reviewed the EISPN for the East Maui Source Development Project and have no comments to make at this time. Thank you for the opportunity to review this document.

Sincerely,

Warren M Lee

WARREN M. LEE
State Conservationist

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 14, 1992

Mr. Warren M. Lee
United States Department of Agriculture
Soil Conservation Service
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Lee:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We have received your agency's advise of "No Comment" dated August 3, 1992. Thank you for your prompt review of our document.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life"

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 14, 1992

Ms. Meredith J. Ching, Vice President
A & B HAWAII, INC.
822 Bishop Street
P. O. Box 3440
Honolulu, Hawaii 96801

Dear Ms. Ching:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your firm's comments dated July 20, 1992 on the proposed East Maui Water Development Plan. Thank you for combining the affected Alexander & Baldwin companies in your comments. Please be assured that your concerns on the siting of storage reservoirs, the alignment of the transmission lines, and the construction time schedules will all be coordinated with your company's activities so that as minimum a disruption as possible to the various operations will be achieved. As the process of this environmental review continues, we will most definitely maintain continuous contact with A&B so that all concerns can be addressed.

Thank you for your timely comments and we look forward to your continuing input.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

ABHII

A&B-HAWAII, INC.

July 20, 1992

Meredith J. Ching
Vice President

Mr. Carl Takumi
Norman Saito Engineering Consultants, Inc.
c/o Environmental Communications Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Carl:

RE: EISPN for the East Maui Water Development Plan

Thank you for providing us with notice of the preparation of an EIS for the Department of Water Supply's East Maui Water Development Plan. The following are the combined comments of the Alexander & Baldwin, Inc. (A&B) companies.

We fully support the Department's efforts to develop needed water supplies for Central Maui in a timely fashion. East Maui aquifers are a reasonable source for water for Central Maui and we support the Department's decision to pursue the development of these resources.

However, we do have some concerns with how this plan is to be implemented. As noted your summary (page 2), other than the governmental bodies, A&B is the only other major landowner affected. Our principal concern is the potential disruption to our agricultural operation, Hawaiian Commercial & Sugar Company (HC&S). We ask that the siting of the Department's facilities (wells, pipelines, tanks, etc.) be done so as to minimize the disruption to HC&S--both during construction and during operation. For example, pipelines should be sited outside of our heavily used roads. Public rights-of-way should be used as much as possible. If pipelines are to be located along routes used by cane haulers, the pipe should be permanently protected. HC&S should be properly compensated for any damages or inconveniences caused by the water project, and relieved of any situations of liability due to interaction with the construction or operation of the project.

Finally, it is unclear whether all of the eleven well sites have been identified. If so, on whose land? Also, is it certain that all 16 MGD can be developed within the designated "project location?" Would it not be safer to broaden the eastern boundary to Honopou in case the wells require greater spacing?

JUL 21 1992

822 Bishop Street • P.O. Box 3440 • Honolulu, Hawaii 96801 • Telephone (808) 525-6669 • Fax (808) 525-6652

A subsidiary of Alexander & Baldwin, Inc.

Again, let us express our support for the project and the efforts of the Department of Water Supply. Due to our interests, we ask that we be conferred with regularly as the plans become more defined and that our operational interests be taken into account. Please remember that we are in a business that has very little tolerance for added costs and reduced efficiencies.

Thank you for this opportunity to comment.

Very truly yours,

Meredith J. Ching

MJC/rt

cc: R. L. Warzecha

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 14, 1992

Ms. Esther Ueda, Executive Officer
State Land Use Commission
Old Federal Building, Room 104
Honolulu, Hawaii 96813

Dear Ms. Ueda:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT- EISPN

We have received your office's comments dated August 4, 1992 on the proposed East Maui Water Development Plan. In response to your two comments, we offer the following:

1. We have examined the three affected Maui USGS quad maps for the area and will identify more specifically, the project parameters. There will be a State land use map indicating the various designations.

2. The Office of the State Planning was included in the July 7, 1992 distribution of the EISPN for this project. We anticipate that their comments will reflect those items listed in your comment letter.

Thank you for your prompt attention to this EISPN and we look forward to your continuing cooperation.

Sincerely,

for David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life"

JOHN WAIHEE
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

RECEIVED
AUG - 5 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

August 4, 1992

Mr. Carl K. Takumi, P.E.
Norman Saito Engineering
Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Takumi:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan

We have reviewed the information for the subject EISPN transmitted by your letter dated July 2, 1992, and have the following comments:

1) It appears that the proposed Development Plan area, as shown on the Project Site Plan (Figures 2), is located within the State Land Use Urban, Agricultural, and Conservation Districts.

   We suggest that the Draft EIS include a map that delineates the Development Plan area in relation to the State Land Use Districts.

2) We note that the Office of State Planning's Draft State Land Use District Boundary Review Report for Maui includes several recommendations for the reclassification of Agricultural District lands in the vicinity of the proposed Development Plan area. This includes a Priority 1 recommendation to reclassify the East Maui Watershed, between Opana and Honopou Gulches, from the Agricultural District to the Conservation District. As such, we suggest that the Office of State Planning be consulted in the preparation of the Draft EIS.

We have no other comments to offer at this time.

Thank you for the opportunity to comment on this matter.

If you have any questions, please call me or Steve Tagawa of my staff at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:fl

cc: OEQC
DBED
OSP

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
JOYCE T. OMINE
AL PANG
JEANNE K. SCHULTZ
CALVIN M. TSUDA

IN REPLY REFER TO:
STP 8.4763

July 17, 1992

Mr. Carl K. Takumi, P.E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Takumi:

Subject: EIS Preparation Notice
East Maui Source Development Project
Ease Maui Water Development Plan

The Environmental Assessment for East Maui Water Development Plan describes the installation of new water transmission lines that will impact our State highway system. We ask, therefore, that all plans for work within our State highway rights-of-way be submitted to our Highways Division for review, approval, and coordination.

We appreciate this opportunity to provide comments.

Sincerely,

Rex D. Johnson
Director of Transportation

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 11, 1992

Mr. Rex D. Johnson, Director
DEPARTMENT OF TRANSPORTATION
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Johnson:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Thank you for your agency's comments dated July 17, 1992 on the proposed EMPlan.

Please be assured that our engineering staff and the design consultant will be in contact with the SDOT District Engineer for work within the State Highways' rights-of-way. Final drawings will be provided to the Highways Division for review and approval.

Thank you for your continuing interest and cooperation.

Sincerely,

for David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life."

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 31, 1992

Mr. William W. Paty, Chairperson
Department of Land & Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Paty:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your department's comments dated August 14, 1992 on the proposed East Maui Water Development Plan. We respond to the following:

1. Our preliminary studies on the hydro-geological conditions of the eleven proposed well sites indicate that the wells will be to obtain potable water from the basal aquifer and not from perched or dike water. As such, we do not anticipate significant negative impacts to streams and other surface water sources.

2. At the present time, the proposed alignment does not traverse Conservation District lands. In the event that the final selected alignment does move through Conservation lands, we will be preparing and filing the required applications for the Conservation District Use Application.

3. A Stream Channel Alteration Permit will probably be required in view of the current alignment through Maliko Gulch. Again, we will maintain contact with your department on this subject and move accordingly to prepare and file the necessary permits.

We appreciate your agency's comments and look forward to working together with the State on a most critical project.

Sincerely,

David R. Craddick
Director

HK:ab

"By Water All Things Find Life"

OFFICE OF STATE PLANNING
Office of the Governor

MAILING ADDRESS: P.O. BOX 3540, HONOLULU, HAWAII 96811-3540
STREET ADDRESS: 250 SOUTH HOTEL STREET, 4TH FLOOR
TELEPHONE: (808)587-2846, 587-2800
FAX: Director's Office 587-2846
Planning Division 587-2824

August 4, 1992

RECEIVED
AUG - 7 1992
NORMAN SAITO ENGINEERING CONSULTANTS INC.

Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793

Attention: Mr. Carl K. Takumi

Dear Mr. Takumi:

Subject: Comments on Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan

The Office of State Planning (OSP) has reviewed the subject EISPN for the East Maui Water Development Plan. The proposed project involves the design and installation of water transmission lines, storage reservoirs and the drilling of source wells. This development is intended to meet the needs of the Central Maui Water District for the next 20 years.

We assume that the State Department of Land and Natural Resources, Division of Water Resource Management, will be commenting on the EISPN. Therefore, OSP has no comments at this time.

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

Sincerely,

for Harold S. Masumoto
Director

cc: Honorable William W. Paty

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 25, 1992

Mr. Harold S. Masumoto, Director
Office of State Planning
Office of the Governor
P. O. Box 3540
Honolulu, Hawaii 96811-3540

Dear Mr. Masumoto:

Subject: COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN) FOR THE EAST MAUI WATER DEVELOPMENT PLAN

We have received your Office's comments on the above project dated August 4, 1992. Your assumption that the Department of Land and Natural Resources, Division of Water Resource Management would respond is correct. Thank you for your position of no comment and we appreciate your continuing interest in our County projects.

Sincerely,

DAVID R. CRADDICK
Director

HK:rka

cc: Norman Saito Engineering Consultants, Inc.

JOHN WAIHEE
GOVERNOR OF HAWAII

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:

August 13, 1992

92-242/epo

RECEIVED
AUG 19 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Mr. Carl K. Takumi, P.E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui 96793

Dear Mr. Takumi:

Subject: Environmental Impact Statement Preparation Notice
East Maui Water Development Plan

Thank you for allowing us to review and comment on the subject project. We have no comments to offer at this time.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 31, 1992

Dr. John C. Lewin, M.D., Director
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your department's comments dated August 13, 1992 on the proposed East Maui Water Development Plan and note your position of no comments at this time. We are planning the Draft Environmental Impact Statement which will be circulated for comment, and we look forward to your review and comment at that time.

Thank you for your continuing interest and concern.

Sincerely,

David R. Craddick
Director

HK:ab

"By Water All Things Find Life"

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

July 24, 1992

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

LOG NO.: 5770
DOC No.: 2403a

RECEIVED
JUL 28 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Mr. Carl K. Takumi, P. E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Takumi:

SUBJECT: Historic Preservation Review of the Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan
Makawao and Wailuku, Maui
TMK: 2-5, 2-7; 3-8

Thank you for the opportunity to comment on this document.

According to this document, the East Maui Water Development Plan will include the design and installation of water transmission lines, reservoirs, and the drilling of wells from Makawao to Wailuku District. It also states that construction will be conducted mostly within the State/County roads right-of-way and agricultural fields, but gulch crossings will impact undisturbed areas. This document proposes to conduct archaeological surveys in these undisturbed areas. We recommend that all undisturbed areas, not only the gulch crossings for the transmission line but also the proposed locations of the reservoirs and wells, be covered in an archaeological survey to determine the presence of significant historic sites. The background research should also include an assessment of the possibility of significant subsurface deposits along the rights-of-way and cultivated fields. The EIS should identify all significant historic sites, assess the effects of the proposed project on the sites, and propose measures to mitigate the effects. A copy of the final archaeology survey report should be included in the EIS. We would be willing to review the final report to resolve any problems or disagreements before it is used in the EIS.

Please contact Ms. Annie Griffin at 587-0013 if you have any questions about these comments.

Sincerely,

for DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

c: Sam Lemmo, OCEA (File No. 93-014)

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 14, 1992

Mr. Don Hibbard, Administrator
STATE HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND & NATURAL RESOURCES
33 South King Street
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Thank you for your agency's comments dated July 24, 1992 on the proposed East Maui Water Development Plan. We have provided your comments to the archaeological consultant for his information and use. They will be in contact with your designated Maui County staff planner to work on the specifics of the archaeological study for this project.

Your timely comments are appreciated. Be assured that we will be in contact with your agency during the planning process.

Sincerely,

for David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

July 27, 1992

Planning Division

RECEIVED
JUL 30 1992
NORMAN SAITO ENGINEERING CONSULTANTS INC

Mr. Carl K. Takumi, P.E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Takumi:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Implementation of the water development plan would involve construction of gulch crossings, source wells, and storage reservoirs. A DA permit is required for work in waters of the United States. The applicant should consult with Operations Division (telephone 438-9258) about permit requirements as the plan progresses.

b. Flood hazard information can be provided when specific project details are determined.

Sincerely,

Kisuk Cheung, P.E.
Director of Engineering

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

RECEIVED
AUG 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS INC

August 14, 1992

Mr. Kisuk Cheung, P.E.
DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
Building 230
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your agency's comments dated July 27, 1992 on the proposed East Maui Water Development Plan. Under the requirements of the Corps of Engineers, we will, as required, comply with the applicable permits listed in your comment letter. At this time, the construction plans for the various gulch crossings, well sites, and storage reservoirs are at the preliminary stages of engineering design. Final site selection and planned improvements will be an integral part of this document as comments are received on the proposed project. We will maintain contact with the Operations Division as the planning phase continues.

Thank you for your timely comments. We look forward to working with your agency on this project.

Sincerely,

for David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life."

JOHN WAIHEE
GOVERNOR

RUSSEL S. NAGATA
COMPTROLLER

ROBERT P. TAKUSHI
DEPUTY COMPTROLLER

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

LETTER NO. (P)1652.2

JUL 17 1992

RECEIVED
JUL 21 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Mr. Carl K. Takumi, P. E.
Norman Saito Engineering Consultants, Inc.
2158 Main Street, Suite 203
Wailuku, Maui, Hawaii 96793

Gentlemen:

Subject: East Maui Source Development Project
EISPN for East Maui Water Development Plan

Thank you for the opportunity to review the subject document. We have no comments to offer.

Should there be any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RY:jk

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

RECEIVED
AUG 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

August 14, 1992

Mr. Gordon Matsuoka
DEPARTMENT OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your agency's comments dated July 17, 1992 on the proposed East Maui Water Development Plan. Thank you for your timely response. Your stated position is on record.

Sincerely,

for David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life."

JOHN WAIHEE
Governor

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814-2512

YUKIO KITAGAWA
Chairperson, Board of Agriculture

ILIMA A. PIIANAIA
Deputy to the Chairperson

FAX: 973-9613

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96823-2159

July 24, 1992

RECEIVED
JUL 30 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Mr. Carl K. Takumi, P E
Norman Saito Engineering Consultants, Inc.
2158 Main Street, Suite 203
Wailuku, HI 96793

Dear Mr. Takumi:

SUBJECT: East Maui Source Development Project Environmental Impact Statement Preparation Notice (EISPN) for the East Maui Water Development Plan

The Department of Agriculture (DOA) has reviewed the EISPN and offers the following comments.

The East Maui Water Development Plan (EMPlan) proposes the design and construction of transmission lines, storage reservoirs, and the drilling of source wells to meet the needs of the Central Maui Water District for the next 15-20 years.

Our principal concern in the subject EISPN is whether or not the increase in water demand as determined in the EMPlan will affect the current agricultural water usage. For example, will the additional withdrawal of water in the subject area over the next five to ten years have any adverse impact on water sources feeding into the East Maui Irrigation System?

The DOA would like to be a consulted party for the Draft EIS.

Thank you for the opportunity to comment.

Sincerely,

Yukio Kitagawa

Yukio Kitagawa, Chairperson
Board of Agriculture

c: Office of Environmental Quality Control

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 20, 1992

Mr. Yukio Kitagawa
BOARD OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512

Dear Mr. Kitagawa:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Thank you for your Department's comments dated July 24, 1992 on the proposed East Maui Water Development Plan. The planned improvements are to be implemented in conjunction with the MAUI COUNTY WATER USE AND DEVELOPMENT PLAN as part of the continuing planning process pursuant to the State Water Code, HRS Chapter 174C. This document is now in final review draft stage and will be finalized in 1992. The planning strategy is to make available water to the designated urban development in Wailuku-Kahului, Paia-Haiku, and Kihei-Makena. The proposed wells are in the basal aquifer and will not affect water availability to the East Maui Irrigation System. We will look forward to your agency's valuable overview on this project.

Thank you again for your timely comments. Please be assured that the Department will be in contact with your Department.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life"

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

EDWARD V. RICHARDSON
MAJOR GENERAL
ADJUTANT GENERAL

MYLES M. NAKATSU
COLONEL
DEPUTY ADJUTANT GENERAL

July 16, 1992

RECEIVED
JUL 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Engineering Office

Mr. Carl K. Takumi
Norman Saito Engineering Consultants, Inc.
2158 Main Street, Suite 203
Wailuku, Maui, Hawaii 96793

Dear Mr. Takumi:

Subject: Environmental Impact Statement Preparation
Notice for the East Maui Water Development Plan

Thank you for providing us the opportunity to review the above mentioned environmental impact statement.

We have no comments to offer at this time regarding the project.

Sincerely,

Jerry H. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting and Engineering Officer

NATIONAL GUARD
Americans At Their Best

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

RECEIVED
AUG 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

August 14, 1992

Col. Jerry H. Matsuda
HAWAII AIR NATIONAL GUARD
DEPARTMENT OF DEFENSE
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Col. Matsuda:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are in receipt of your prompt response dated July 16, 1992 to our EISPN for the East Maui Water Development Plan. Thank you for your review and stated position on our project.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life"

11/05/61 19:53 002

JOHN WAIHEE
GOVERNOR

CHARLES T. TOGUCHI
SUPERINTENDENT

OFFICE OF THE SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

September 4, 1992

RECEIVED
SEP 18 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Mr. Carl K. Takumi
Norman Saito Engineering
Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Takumi:

SUBJECT: East Maui Source Development Project
Environmental Impact Statement Preparation Notice
East Maui Water Development Plan

We have reviewed the subject notice and have no comment to offer at this time. The concern of the Department of Education (DOE) is that the need for new schools is associated with future housing developments. The DOE has provided input concerning the Community Development Plans (CDP). We request that the need for schools identified in the CDP located in the areas covered by the water development plan is correlated with the need for adequate water allocations when the schools are built.

Should there be any questions, please call the Facilities Branch at 737-4743.

Sincerely,

Charles T. Toguchi
Superintendent

CTT:hy

cc: A. Suga
L. Lindsey

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 28, 1992

Mr. Charles T. Toguchi
Department of Education
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Toguchi:

Subject: EAST MAUI SOURCE DEVELOPMENT - EISPN

Thank you for your department's supportive comments on our proposed EMPLAN. As with all State and County agencies that will be affected by this proposed project, as each phase or segment becomes operational, your department will be advised so that Facilities Planning Branch staff can incorporate their long range plans into the System.

Thank you again for your comments and continuing concern.

Sincerely,

for DAVID R. CRADDICK
Director

HK:rka

"By Water All Things Find Life."

Printed on recycled paper

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:OCEA:SKK

AUG 14 1992

FILE NO.: 93-014
DOC. ID.: 1229

RECEIVED
AUG 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS INC.

Mr. Carl Takumi, P.E.
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Takumi:

SUBJECT: Environmental Impact Statement Preparation Notice
for the East Maui Water Development Plan

Thank you for giving our Department the opportunity to review the EIS Preparation Notice for the East Maui source development project. We have the following comments.

Brief Discussion:

The East Maui Water Development Plan (EMPlan) has been developed in response to existing Community Development Plans for the Wailuku-Kahului, Kihei-Makena, and Paia-Haiku Community Plan regions. Water demand projections and calculations for these sectors have been based on projected consumption presented in previous reports. The EMPlan involves the design and construction which needs to take place within the next 15 years to meet anticipated water demand.

Proposed is the construction of a 36" transmission main from East Maui water sources to the existing 36" Central Maui Transmission Pipeline near Kuihelani Highway. Intermediate connections to the Central Maui Water System between Hamakuapoko and the Central Maui Transmission Pipeline are proposed at Paia, Haleakala Highway and Puunene. The transmission line will also be extended east from Hamakuapoko across Maliko Gulch and into the Haiku area. Water from the Haiku area wells located mauka of this transmission line will be connected to the transmission line after passing through control/chlorine contact tanks. Connections to the control tanks will be made to serve some of lower elevation Haiku area, thus expanding the area served by the Central Maui Water System, and reducing the size of the Makawao District Service Area.

Additional phases of the EMPlan call for: 1) extending the transmission line in an easterly direction from Hamakuapoko into the Haiku area; 2) digging eleven (11) wells with a total anticipated well capacity of 16 million gallons per day (MGD); and 3) constructing six (6) pressure/break supply tanks with a total storage capacity of 5 million gallons.

Division of Aquatic Resources Comments:

The forthcoming EIS should describe the impact the proposed activities will have on the area's freshwater and marine resources, and proposed mitigative measures. Particular emphasis should be placed on the applicant's proposal to dig eleven new wells and pump 16 MGD.

Office of Conservation and Environmental Affairs Comments:

Chapter 183-41, HRS, and the Department's Administrative Rules (Title 13, Chapter 2) needs to be addressed for the use of Conservation District lands. Specifically, the County of Maui will need to obtain a Conservation District Use Application for any portion of the project that transits conservation lands.

In addition, Stream Channel Alteration Permits may be required from the Commission on Water Resource Management for stream crossings and modifications.

Our Department's Historic Preservation Division has already responded to the County in a separate letter.

Thank you for your cooperation in this matter. Please feel free to call Sam Lemmo at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

WILLIAM W. PATY

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96732-0398 • (808) 871-8461

July 29, 1992

Mr. Carl Takumi
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, HI 96793

Dear Mr. Takumi:

Subject: EAST MAUI SOURCE DEVELOPMENT PROJECT
Environmental Impact Statement Preparation Notice
(EISPN) for the East Maui Water Development Plan

Thank you for the opportunity to comment on the subject EISPN. Although we do not have any comments on the EISPN document, we do want to ensure that any work required by Maui Electric Company, Ltd. (MECO) to provide electrical service to any part of the proposed waterline that needs environmental review be included in your EIS preparation process. This will eliminate the need for MECO to prepare its own environmental document for the installation of power lines and other electrical equipment, thereby reducing the possibilities of project delays.

According to your projected phases and dates for the subject project, Phase 1 is scheduled for completion by June 1993. If any electrical service is required for this first phase (or subsequent phases), it is imperative that MECO be contacted as soon as possible with regards to the details of the project.

If you have any questions or concerns, please contact David Park at 871-2372.

Sincerely,

Edward L. Reinhardt

Edward L. Reinhardt
Manager, Engineering

DP:ka

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 14, 1992

Mr. Edward L. Reinhardt
MAUI ELECTRIC COMPANY, LTD.
210 West Kamehameha Avenue
P. O. Box 398
Kahului, Hawaii 96732

Dear Mr. Reinhardt:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Thank you for your comment dated July 29, 1992 on the proposed East Maui Source Development Plan. While it is premature at this early juncture to determine specifically the electrical demand for our project, the typical requirements will be at the various pump and booster stations, as well as the well sources. We anticipate including these mechanical component items in the environmental discussion for the project; the availability of power source to the required location may require environmental analysis on the part of MECO since we cannot predict or plan how electricity to the various sites requiring electrical power will be provided. Please be assured that there will be adequate lead time for electrical source delivery planning and that MECO will be an integral part of the planning process.

Thank you for your timely comment. Please be assured that the Department will be on continuous contact with your agency.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

"By Water All Things Find Life"

ISAAC DAVIS HALL
ATTORNEY AT LAW
2087 WELLS STREET
WAILUKU, MAUI, HAWAII 96793
(808) 244-8017
FAX (808) 244-6778

OF COUNSEL
G. RICHARD DEBCH

August 5, 1992

Mayor Linda Crockett Lingle
Office of the Mayor
County of Maui
200 S. High St.
Wailuku, HI 96793

Re: EIS Preparation Notice for the East Maui Source Development Plan

Dear Mayor Linda Crockett Lingle:

I represent various residents of the East Maui area within which wells are proposed to be developed pursuant to the East Maui Source Development Plan. On their behalf, I request to become a consulted party pursuant to §11-200-15(b) of this state's "Environmental Impact Statement Rules" (hereafter "Rules"). By these Rules, the consultation process is to be used to develop a fully acceptable EIS prior to the time the Draft EIS is completed.

I have reviewed the Environmental Assessment and the Preparation Notice prepared for this project by Norman Saito Engineering. From the outset, it must be acknowledged that the Saito Engineering firm may have a conflict of interest with respect to this project because it received funds to plan this project and it may receive further funds after the completion of this EIS to pursue the project. I have the comments which follow on the Environmental Assessment and the Preparation Notice:

1. Description of the project

The Maui County Water Use and Development Plan ("County Development Plan") recommends drilling between 25 and 28 wells in the Haiku area to obtain between 14 and 25 mgd and transmitting this water to Waihe'e, Kahului, Wailuku, Maalaea, Kihei, Wailea and Makena. Rural Haiku would be subsumed within the urban Wailuku water system.

At the same time, the East Maui Water Development Plan ("East Maui Plan") calls for the construction of 11 wells, with a total anticipated capacity of 16 mgd, and transmission of this water to serve the needs ascribed to the areas above.

The scope of this project should not be limited to the study of 11 wells producing 16 mgd. It must be expanded to analyze the environmental impacts of drilling between 25 and 28 wells producing between 14 and 25 mgd.

2. Multiple or phased agency actions

Groups of actions proposed by an agency must be treated as a single action when component actions or phases are increments of a larger total undertaking, when an individual project is a necessary precedent for a larger project, or when an individual project represents a commitment to a larger project. See §11-200-7 of the Rules. Members of the Board of Water Supply ("BWS") have discussed proceeding with segments of the East Maui Plan without an EIS. For example, the BWS has applied for a pump installation permit for its first well. Also, the Board has discussed installing a 12 inch pipeline from the first well to the Kamaole Pipeline to supplement upcountry water demands. Both of these projects are components of the larger project and must be included within the scope of the EIS.

No action with respect to any component of the East Maui Development Plan (other than the already approved drilling of the two test wells) can take place without violating our state's environmental law. The water derived from the two wells cannot be used for any purpose by the County of Maui without violating these rules.

3. Purpose of the proposed agency action

The Preparation Notice indicates that the purpose of the proposed action is simply to meet the water needs required in the Wailuku-Kahului, Kihei-Makena and Paia-Haiku Community Plans. It is too facile to suggest that this plan has been developed simply to meet the water demand created by the "build-outs" in the three referenced community plans, for the following reasons.

First, the wells area being drilled on A&B land and some analysis should be included with regard to any agreements with A&B and on all A&B projects serviced by this new systen. Second, it is widely understood that at least some of the entities entitled to water under the Joint Venture Agreement for the Central Transmission Line will have priorities to the water developed in East Maui. Third, the County Development Plan, in Table 1.45 on page 1-18, includes a chart showing the "Total Projected Increase in Demand for Wailuku System" which demonstrates that the increase in demand is being generated through amorphous Project Districts in Wailuku-Kahului and Kihei-Makena including, for example, the Waihe'e Golf Course Project and Wailea 670. Some discussion must be

included on whether these proposed uses are reasonable or beneficial and on whether priorities should be established for the use of the water developed in East Maui, reserving water for such uses as Hawaiian Home lands, promoting diversified agriculture and providing affordable housing.

4. Neither the Environmental Assessment nor the Preparation Notice identify the significant adverse impacts which may result from this agency action.

The Rules contain clear instructions on the types of activities which typically have significant effects on the environment. See §11-200-12. Neither the Environmental Assessment nor the Preparation Notice adequately address these criteria.

The Preparation Notice includes a statement that the development of 16 mgd in East Maui will not be "a stimulus for growth" but instead simply meets the water needs required in the Wailuku-Kahului, Kihei-Makena and Paia-Haiku Community Plans. This project's precursor, the Central Maui Transmission Line, certainly stimulated growth in Kihei and Makena. It is too facile to suggest that this Plan has been developed simply to meet the water demand created by the "build-outs" in the three referenced Community Plans, for the following reasons.

While the Hawaii Water Plan requires data on the sustainable yields for all hydrologic units, the Commission on Water Resources Management ("CWRM") has recently adopted the term "developable yield" which means the net amount of water which can be developed after amounts are subtracted for other purposes such as in-stream values, when a well may diminish stream flow. Neither Plan attempts to quantify developable yield.

The Preparation Notice indicates that Haiku will be subsumed within the area served by the Central Maui Water System. Some discussion of the impact of this must be included since the Paia-Haiku Community Plan calls for a primarily rural-agricultural region whereas the other areas served by the Central Maui Water System are primarily urban in nature.

The EA is weak not only in its description of the technical characteristics of the project but also in its description of its social, economic and environmental characteristics. Likewise, its discussion of the affected environment, summary of major impacts and mitigative measures are wholly insufficient.

In result, only three reasons are given to support the determination that an EIS is necessary. If the only issues addressed in the EIS are those stated in Section VI of the Environmental Assessment, the document will be unacceptable.

Other issues must be addressed, in addition to those already discussed above. As a primary example, what will be the impact of drilling 11-28 wells, spread eastward across Haiku, on the many streams and springs in the area? This issue has not even been mentioned in the EA or the Preparation Notice. This is a primary concern of East Maui residents. This is a subject matter about which more must be known before the County Development Plan is adopted and before the East Maui Plan is implemented.

If the BWS intends to implement the East Maui Plan, it should immediately allocate funds to collect baseline data with respect to all of the streams and springs which could be affected by the drilling of the 11-28 wells. The availability of this data base will be absolutely essential in assuring that in-stream values, riparian and appurtenant water rights are protected, as required by the State Water Code.

5. The alternatives proposed for analysis are incomplete.

The Rules require the study of all reasonable alternatives which could achieve the goals of the proposed action. The Preparation Notice includes no discussion of the feasibility of developing alternative water resources. The County Development Plan indicates that 8 mgd can be developed in the Waihe'e Aquifer for $18.6 million. No adequate explanation is included on why the development of this resource has not been recommended. This is a subject which must be discussed in the EIS.

6. Clarification of the statement of the preparer

A letter from Saito Engineering dated July 2, 1992 states:

> The EISPN is being prepared for submittal to the Board of Water Supply for their subsequent review and acceptance as a full Environmental Impact Statement (EIS).

The implication is that the EA will be transformed into an EIS. The BWS should take this opportunity to correct this statement. The EA does not meet the legal requirements for an EA, much less the much more rigorous requirements for an EIS.

7. <u>The EIS must be expanded to meet content requirements</u>

Finally, the Rules provide specific guidance on the content requirements for the EIS. The Environmental Assessment and the Preparation Notice are inadequate and circumscribe too narrowly the scope of an acceptable EIS. The East Maui Water Development Plan cannot be adopted until all of the significant adverse impacts of such an effort are known.

Thank you for the opportunity to comment as a consulting party.

Sincerely yours,

Isaac Hall

IH/jp
cc: County Board of Water Supply
Norman Saito Engineering Consultants, Inc.
OEQC

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 3, 1992

Mr. Isaac D. Hall
2087 Wells Street
Wailuku, Hawaii 96793

Dear Mr. Hall:

Re: EAST MAUI WATER SOURCE DEVELOPMENT PLAN - EISPN

We have received your comments dated August 5, 1992, on the East Maui Water Development Plan and we respond to the comments as follows:

1. Your reference to the discrepancy between the number of wells to be drilled for source development is understandable. The EMPlan as well as the Maui County Water Use and Development Plan is based upon the anticipated volume of water needed in the next 20 years to serve the three Community Plans associated with our Central Maui Water System. The quantity is based on the Land Use policies as adopted in the Community Development Plan and mandated by the General Plan objectives which is a function of the Planning Department and Maui County Council. The number of wells needed to achieve this objective, based upon more detailed analysis, has shown that fewer wells than originally planned may be capable of producing the needed volume of water to meet the demands. Other wells may be necessary; however, the number and location of other wells can only be determined after these exploratory wells are tested. The EIS will be amended accordingly should the necessity arise.

2. The reference to "Phased or Multiple" agency actions is understood and the development of the EIS document is witness to that awareness. The Board of Water Supply will not act or proceed in matters of developing water supply for Maui County consumers in violation of State or County ordinances or laws.

3. Both the Department and the Board of Water Supply are aware that there may appear to be a potential for preference to

landowners and other interests. However, any agreement or relationship that would be binding on the Department must be ratified by the Board in open and public session. It is the Department's intent to develop water as a resource for the County as a whole, without specific preference or priority as to who that consumer may be.

4. The significant adverse impacts will be identified as they come to the surface in the EIS analysis being conducted by the consultants. The Department will respond to the best of its ability, and will insure that the engineering consultants provide the best technical data to respond effectively to your stated concerns. The fifteen year duration of the EMPlan permits close monitoring of the yield being realized as each pair of wells are drilled. If more wells are determined to be drilled, or fewer wells are considered necessary, this decision will be made by the Department based on engineering principles with the policy of not adversely impacting the Paia-Haiku aquifer. The wells are basal aquifer wells and will not affect the surface and perched water sources.

5. Alternative alignments were discussed and evaluated by the Consultants, Department staff and the Board. The preferred alignment is what is being analyzed in the EIS currently in preparation. The Waihee Aquifer and the 8 mgd development capability for $18.6 million dollars was examined and discarded since it would not have met the total demand predicted by the Community Development Plans.

6. The matter dealing with the Board of Water Supply reviewing and determining the acceptability of the EIS documents was done with the understanding by the Mayor that the Board was the more appropriate body to make this determination. Your assumption that the EISPN or the EA would be transformed into an EIS is incorrect. As to whether the DEIS or the FEIS meets the EIS legal requirements, the Planning Department will also provide their overview expertise on this aspect.

7. The content requirements for the EIS will be met in the DEIS.

Your comments are continuing food for thought; and the Department shares your concerns that the EMPlan is fully reviewed and receives full discussion. As a disclosure document, the EIS will provide adequate information for the Board to arrive at a fair and just conclusion.

Sincerely,

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

Landmark
Maui
Properties

Real Estate Brokers:
Residential, Investment & Retreat Properties
3681 Baldwin Avenue
P.O. Box 429
Makawao, HI 96768
Office: 808-572-6408
Fax: 808-572-1579

Mayor Linda C. Lingle
County office Building
Wailuku, HI 96793

RE: The East Maui Water Development Plan, Environmental Assessment thereof

Dear Mayor Lingle:

The Maui Board of Water Supply (BWS) is considering adopting the above plan which recommends drilling 25-28 wells to obtain 14-25 mgd, then transmitting this water from East Maui into the Central Maui Water System to supply Central & South Maui's water needs into the next century.

The Environmental Assesment (EA) prepared by Norman Engineering Consultants, Inc. is a superficial and flawed document that doesn't begin to deal with the implications of such a vast undertaking.

The EA doesn't raise the critical question as to who pays for the project and who benefits. It is obvious that developers are the chief beneficaries and that A&B is the principal beneficiary, specifically their proposed developments in the Paia/Haiku areas. Without water, land is not so valuable; water makes the difference. We will be making developers wealthy while impoverishing the landowners, farmers and residents of E. Maui.

Far beyond the scope of this EA, but of untmost relevance is the question of this island's ability to feed itself. In the years of cheap water in California and inexpensive shipping costs, it has been possible to import food for less that it costs to grow it here. At this point we import over 70% of our food. Only modest changes in national and/or international conditions and we could find ourselves unable to feed our people. Nor could we quickly do victory gardens in the new subdivisions. We need a long-term agricultural development plan, supported by a water plan, together with a policy that supports farmers so that we have the resources to feed ourselves.

This is not a issue of any interest to developers who job is to do whatever is necessary to make their investments pay off. It is a matter of long-range vision and strategy. Yet of the utmost importance to the farmers and growers of E. Maui and the Upcountry area and all the people of Maui, especially policy makers.

Clearly water policy, water development and allocation is critical and must conform to the growth guidelines developed in the Community Plans and in the County General Plan. Spending $50 million dollars, laying 86,000 feet of transmission line and 24,000 feet of connecting pipes is a major undertaking. Have other, more available and less expensive alternatives been pursued?

The EA dismisses the "Social and Economic Characteristics" in two pragraphs. The EA claims the the EMPlan is " not in and of itself a stimulus for growth, but is a mandate from the Community Development Plans previously implemented as land use policies for Wailuku-Kahului, Kihei Makena, and Paia-Haiku Community Plan regions." The delivery of water is absolutely a stimulus for growth as evidenced by the dramatic growth of South Maui after the development of the Central Maui transmission line in the mid-70s.

Some social and economic impacts of such extravagant and exhorbitant transfer of resources for the benefit of developers are: * the character of rural life will be irrevocably changed in a short period of time; * the essential resources for fruit and vegetable farming and flower production will be dramatically decreased in E. Maui and throughout the Upcountry area; * appurtenant and riparian rights will be ignored in favor of making desert land very valuable to developers; * Hawaiians will, once again, have their dreams deferred; * The recommendations of the Paia-Haiku community association will be ignored as will the recommendations of the Maui County General Plan.

There is no mention of the environmental impact of drilling 25-28 wells in East Maui. Dozens of streams may be affected, along with the lifestyle of people living along those streams.

There should be further mention of what arrangements, understandings, benefits and agreements have been made with A&B regarding easements, water allocations, and proposed developments.

Given adequate rainfall and proven reserves, E. Maui is a community that would gladly share its resources with our island neighbors, especially farmers and Hawaiian Home Lands owners. But with such clear warnings signs of the limits to our scarce physical resources and further limits to our financial resources and the already known and unmet needs of our farmers and Hawaiian Homes landowners, this EA offers inadequate evidence for proceeding with the development os the proposed EMPlan.

The devastating drought of this past winter should be a wakeup call to all of us. (I walked stream beds that haven't be dry in 20 years.) Given scant knowledge of the actual water reserves in this area and the huge demand that this EMPlan proposes to satisfy together with the tremendous impact such a diversion will have on the resources of this area, I recommend that E. Maui be designated a water management area under provisions of HRS 174c-41. Grounds for such a designation may be found, I believe, in both ground water criteria and surface water criteria. See HRS 174C-44&45.

Sincerely,

Mark Sheehan(PB)

cc: Carl Takumi
Norman Saito Engineering Consultants

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 31, 1992

Mr. Mark Sheehan
LANDMARK MAUI PROPERTIES
P. O. Box 429
Makawao, Hawaii 96768

Dear Mr. Sheehan:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Your recent letter to Mayor Lingle was forwarded to our office for response, and we provide the following responses to your comments:

1. Financing of the EMPLAN - We would point out to you and others who perhaps are not aware of the semi-autonomous status of the Department. As such, we are able to establish through formal hearings by the Board of Water Supply, operating rules and regulations that include the establishment of fees for water services. The Central Maui Source Assessment Fee has been in practice for over 15 years and the proposed EMPLAN will be financed by the Department in its entirety. Beneficiaries of water development are the consumer public, and we do not differentiate who that public is.

2. The EMPLAN is not designed to diminish or remove current sources of agricultural water to the East Maui agricultural users. Water that will be developed from the proposed well sites draw their source from the basal aquifer, and high level water will not be negatively impacted.

3. Alternative and less expensive alternatives for water development have been studied by the Department. These include desalinization, dual system for potable and non-potable, i.e. treated sewage effluent for agricultural use, and less water intensive landscaping for private and public users. Of specific interest to this project is the ability to develop the Iao aquifer to the maximum yield remaining. This alternative was examined from a cost-benefit analysis and it was concluded that the yield to be realized for the costs to be incurred were not in the public's best interest.

"By Water All Things Find Life."

4. Water development as a "stimulus" for growth has been a discussion item throughout the State and the four Counties for many years. The Department does not and will not establish or formulate land use policy for Maui County. This planning function is with the Planning Department and approvals for proposed land uses are with the County Council in the checks and balance system. The Department will continue to provide the water supply to the consumer public where projected growth has been determined and approved, no matter what the zoning designation or who the user may be. The development of adequate source, storage and transmission facilities is not an overnight phenomena, but takes planning, design, and construction well in advance of delivery. It does not, however, precede land use policy decisions and or formulate these policy matters. The character of the upcountry Maui communities will continue to as they are and we will continue to provide them with water as customers of the Department.

5. The environmental impact of "drilling 25-28 wells in East Maui" is the subject of a specific study by the consultant's hydro-geologist. It is their preliminary analysis that the wells to be drilled (five pairs plus a single well) are to be drilled to each and draw water from the Paia basal aquifer. High level water will not be impacted negatively by this drilling. In the event that the yield is not as anticipated, or if there is negative impact to the adjacent streams, the source will be relocated.

Your comments have been forwarded to the engineering consultants and will be included in the Draft EIS. Thank you for your sincere interest and concern.

Sincerely,

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI

David R. Craddick
Director

HK:ab

MAUI TOMORROW
355 Hukilike St.
Suite 209
Kahului, Hawaii 96732
(808) 877-2462
FAX 871-0980

August 7, 1992

Office of Environmental Quality Control
220 S. King St., Fourth Floor
Honolulu, HI 96813

Re: East Maui Source Development Plan (EMPlan) Environmental Assessment

To all concerned:

The top two themes of the Maui County General Plan are: 1) Protect Maui County's agricultural land and rural identity, and, 2) Prepare a directed and managed growth plan.

Maui Tomorrow, a public interest group with broad-based community support and involvement, is committed to sustainable development, growth management, and land conservation for Maui.

The Community Plan for Paia-Haiku lists among its Planning Standards and Principles, the "Protection of Environmental Quality."

Until the following concerns are adequately addressed, the EMPlan will not meet the spirit of the Maui County General Plan, the Paia-Haiku Community Plan, or Maui Tomorrow's community supported standards of ecologically sound planning. It is our view that the community in East Maui, and throughout the island, will be negatively impacted by the East Maui Source Development Plan.

An initial concern is that the EMPlan implementation schedule would not proceed under the guidelines of the new Paia-Haiku Community Plan, currently in revision.

This Community Plan will determine the character of East Maui, as preferred by the community, along with its preference for allocation of the resources there over the next ten years. In contrast, the EMPlan proposes a fifteen year project to meet a twenty year proposed need. It would be both prudent and practical to not only await the conclusion of the Community Plan review process, but also to match the ten year scope of the Community Plan in all affected areas.

Therefore, of necessary consideration in this regard are also the Community Plans for Kihei-Makena and Wailuku-Kahului. Important to note is that the review process, unless otherwise compelled by the Planning Department or the County Council, will not commence until April 1993 for Wailuku-Kahului.

Of additional importance is that a major problem identified by the current Paia-Haiku Community Plan is "Water, or more specifically, the inferior quality of drinking water," and a lack of water pressure in this region. The EMPlan fails to address the environmental and social impact of resource diversion from East Maui. In fact, the only major water problem identified in either the Wailuku-Kahului or Kihei-Makena Community Plans is "insufficient hydrant pressure in Wailuku."

The Environmental Assessment seems to misrepresent the intention and scope of the Community Plans. In Section II.B. it claims that the EMPlan is "a mandate from the Community Development Plans previously implemented as land use policies for [the aforementioned] Community Plan regions. As a 15 year master plan..."

In the ten year Community Plans, there is no "mandate" for a fifteen year EMPlan. In fact, the only time dimension exceeding ten years in the current Paia-Haiku Community Plan, as regards water, is the 11-20 year recommendation to "Promote water conservation and awareness programs."

It has also come to our attention that the Board of Water Supply is considering adopting the County Development Plan which recommends drilling 25-28 wells in the East Maui region. By contrast, the Environmental Assessment for the EMPlan only discusses 11 wells to be drilled. This is another way in which the EA does not fully address the scope of source development plans in East Maui.

An inherent flaw in the EMPlan is that it does not involve scientific investigations and research, nor the accumulation of factual data, for determination of how the water resources in the area may be threatened by the proposed withdrawals and diversions of water.

The EMPlan makes no commitment to exploratory well drilling, but only mentions it as a proposed mitigation of a potential major impact. Without question, a project so vast in its draw on the East Maui water source should begin with testing to establish the scientific data for assessing the proposal and its impacts. Without these data, an adequate Environmental Impact Statement cannot be constructed.

Relative to this lack of research is the potential major impact on the many streams and springs in the area. The EA entirely overlooks these important local resources. Without conducting detailed analysis on all stream and spring flows, preceding the design of the EMPlan, an adequate EIS is impossible. The EIS must go farther in addressing all the issues. Without the establishment of baseline data, no EIS for this EMPlan can possibly be accurate, adequate, or sufficiently address the environmental impacts of the plan.

A final point in this correspondence is the flaw in the unsubstantiated assumption that such a demand for water resources will exist in the Central Maui Water District based on "planned growth." It is historically evident that the availability of desirable resources is among the greatest stimulants for growth and development in an area. To make such a vast quantity of East Maui water resource available to Central Maui will very likely encourage development beyond the guidelines of the affected Community Plans and the Maui County General Plan.

We hope to be presented with a complete, scientifically substantiated, technically accurate, and environmentally sensitive EIS for any EMPlan.

Sincerely,

Richard Joseph Lafond Jr.

Richard Joseph Lafond Jr.
Executive Director

CC: Office of the Mayor
Dept. of Water Supply
Norman Saito Engineering Consultants

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 2, 1992

Mr. Richard Joseph LaFond, Jr.
MAUI TOMORROW
355 Hukilike Street
Kahului, Hawaii 96732

Dear Mr. LaFond:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

Your recent letter dated August 7, 1992 on the subject EMPLAN was received, and we respond to your comments as follows:

1. The two themes of the Maui County General Plan of:

   (1) Protect Maui County's agricultural land and rural identity:

   The protection of Maui County's agricultural land and rural beauty is a function of the General Plan and Community Plan process the Department of Water Supply is mandated to support and willingly supports. The community planning function lies with the Planning Department, the Planning Commission and the Maui County Council.

   (2) Prepare a directed and managed growth plan:

   The EMPlan is a direct response by the Department of Water Supply to provide a directed and managed growth plan for the development of water for the needs of the Central Maui area.

2. The Community Plan are working planning documents and subject to review and revision every ten years to allow for the changing needs of the community. Socio-economic studies performed by the Maui County Planning Department for the Community Plans are based upon 20-year projections. Likewise,

it is only prudent for the Department of Water Supply to have a long range plan such as the EMPlan. The EMPlan like the Community Plans is dynamic and ready to meet changes in water demand.

3. There have been other studies regarding the aquifer in this area. The wells proposed in the EMPlan are part of the process of aquifer exploration and data gathering. The wells are to be constructed in phases and monitored. The result will allow the Department to use the water to meet the water demands of the service area while accumulating data for a better understanding of the aquifer being explored. The 11 wells in the EMPlan is anticipated to provide water needed over a 15 to 20-year period. The wells are basal aquifer wells and will not affect the surface and perched water sources presently being used for agricultural purposes.

4. Finally, on the subject of water as a "Stimulus" for growth, water is only one of many infrastructure improvements that must be realized before growth is stimulated. The phased development of 16 MGD of water is anticipated to occur over a 15-year period and not at one time. The quantity of water needed is based upon Community Plan land used zoning. The Department plans to develop the wells as the need arises.

In conclusion, the EMPlan allows for programmed long-term water development with conscious environmental awareness to meet the needs of the Community Plans within the Central Maui Water Service area.

Sincerely,

David R. Craddick
Director

HK:ab
xc: Norman Saito Engineering Consultants, Inc.

LINDA CROCKETT LINGLE
Mayor

BRIAN W. MISKAE
Director

ROBERT K. KEKUNA, JR.
Deputy Director

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

BILL MEDEIROS
Long Range Division

COLLEEN M. SUYAMA
Current Planning Division

KALVIN KOBAYASHI
Energy Division

July 10, 1992

Mr. Carl Takumi
Norman Saito Engineering
Consultants, inc.
Wailuku Townhouse, Ste 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Takumi:

Re: East Maui Source Development Project
E.I.S. Preparation notice for the East Maui Water Development Plan

In response to your letter dated July 2, 1992 regarding the above referenced matter we have reviewed your Preparation Notice and make the following comments:

1. Although the Technical Characteristics describe Phase 1 of the Plan it fails to identify the subsequent phases except in general terms. If the E.I.S. is to address compliance with HRS 343 for all phases of the Plan then each of those phases should be identified in detail with their potential impacts and appropriate mitigation proposed.

2. Impacts relative to the diversion of water resources from the Paia-Haiku Community Plan Region to the central Maui (Wailuku-Kahului and Kihei-Makena Community Plan Regions) area should be addressed. By directing water resources to another region future development in the area where diversion is occurring will be hampered unless adequate source is available to serve both areas or a commitment is made to limit future urban development in the Paia-Haiku region. What would be the economic and social impacts on these regions as a result of this Plan? This issue should be addressed in the Environmental Impact Statement.

   Also, short term impacts on the labor force and economy will occur. The project will generate construction jobs and secondary services which affects the economy. These should be addressed in the Environmental Impact Study.

3. Potential environmental impacts resulting on traffic, the major gulch crossings, undeveloped lands and agricultural lands, etc. should be identified and addressed in the environmental impact statement. The current assessment identifies only historic/cultural, air and noise and drainage and erosion impacts. However, these impacts are not evaluated in detail except to reference that standards will be met during subsequent permit reviews. The environmental impact statement should address these impacts in greater detail.

4. The various alternatives considered should be described in greater detail in the environmental impact statement.

Thank you for the opportunity to comment on the assessment and Preparation Notice for an Environmental Impact Statement. We further request that the Planning Department be included in your reviewing agencies for the draft and final environmental impact statements.

If additional clarification is required please contact my office at any time.

Very truly yours,

BRIAN MISKAE
Planning Director

cc: David Craddick, DWS
Robert Kekuna
Colleen Suyama

(CS:cs\Letter3.5disk\eiswater)

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

August 31, 1992

Mr. Brian W. Miskae
Director of Planning
County of Maui
Wailuku, Hawaii 96793

Dear Mr. Miskae:

Re: EAST MAUI SOURCE DEVELOPMENT PROJECT, EIS PREPARATION NOTICE

We are in receipt of your agency's comments dated July 10, 1992 on the proposed East Maui Water Development Plan and we respond as follows:

1. The phasing plan and anticipated schedule for the EMPLAN will be detailed using the actual Plan as the format. The mitigation plans will also be discussed to the extent practicable.

2. The technical aspects of diverting water from the East Maui aquifer to the Central Maui Water System will be detailed as provided by the hydro-geologist retained for this project. For your information, the wells to be drilled will be to reach the basal aquifer, and the high level water which can impact the surface sources for Pais-Haiku should not be negatively impacted. Socio-economic impacts to the labor force and the economy in general have not been addressed specifically, but in general, the impacts should be positive in view of the current economic downturn.

3. The physical impacts that will result from the Plan's alignment will be discussed in detail. There is an archaeological study that is nearing completion and the impacts at the major gulch crossings will be discussed. Traffic is not expected to be a major impact item since the work will be taking place on highway or service road rights-of-way. Contractor responsibility for traffice management will be a condition in the bid award process.

"By Water All Things Find Life"

4. Alternative alignments have been evaluated by our engineering and planning staff with the engineering consultant, and the selected alignment has been determined on the basis of both cost and least impact to adjacent communities.

Thank you for your comments and continuing cooperation in our projects. We look forward to your review of the draft E.I.S.

Sincerely,

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI

David R. Craddick
Director

HK:ab

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

September 25, 1992

Ms. Charmaine Tavares, Director
Department of Parks and Recreation
County of Maui
1580 Kaahumanu Avenue
Wailuku, Hawaii 96793

Dear Ms. Tavares:

Subject: EAST MAUI SOURCE DEVELOPMENT PROJECT
Environmental Impact Statement Preparation Notice
(EISPN) for the East Maui Water Development Plan

We have received your department's comments dated July 30, 1992 and acknowledge your no comments position. Thank you for your continuing interest in our projects.

Sincerely,

for DAVID R. CRADDICK
Director

HK:rka

cc: Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF
PARKS AND RECREATION
COUNTY OF MAUI

LINDA CROCKETT LINGLE
Mayor
CHARMAINE TAVARES
Director
ARMAND PADUA
Deputy Director

1580 KAAHUMANU AVENUE, WAILUKU, HAWAII 96793
(808) 243-7230

July 30, 1992

Mr. Carl Takumi
Norman Saito Engineering
Consultants Inc.
2158 Main Street
Wailuku, Hawaii 96793

Subject: EAST MAUI SOURCE DEVELOPMENT PROJECT
Environmental Impact Statement Preparation Notice
(EISPN) for the East Maui Water Development Plan

Dear Mr. Takumi:

We have reviewed the subject EISPN and have no comments to offer at this time.

Thank you for allowing us to comment on the project.

Sincerely,

CHARMAINE TAVARES
Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

October 14, 1992

Mr. David L. Martin
NATIVE HAWAIIAN ADVISORY COUNCIL
1088 Bishop Street, Suite 1204
Honolulu, Hawaii 96813

Dear Mr. Martin:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are responding to your office's comments dated August 7, 1992 on the subject project as follows:

1. Your concerns over the plight of water rights and uses for Hawaiian is correct and proper for your office to pursue. We have avoided distinguishing between types of users but have maintained a service policy that water is available to all residents of Maui County; and we will continue to provide potable water to all Maui County consumers..

2. We feel that the concerns expressed in the balance of your letter would be more suitable for the Office of Environmental Quality Control, the State Legislature, and certainly the Department of Hawaiian Home Lands. It is our position that we will comply with the overall review procedure for processing of documents under the policy of the State.

Thank you for your comments, and we look forward to your review of the DEIS.

Sincerely,

David K. Craddick
Director

HK:ab
xc: NORMAN SAITO ENGINEERING CONSULTANTS, INC.

"By Water All Things Find Life"

NATIVE HAWAIIAN ADVISORY COUNCIL
A Nonprofit Corporation
1088 Bishop Street, Suite 1204, Honolulu, Hawaii 96813
Telephone (808) 523-1445
Facsimile (808) 599-4380

1992 August 7

'92 AUG -7 P

Office of Environmental Quality Control
220 South King Street
Central Pacific Plaza, Fourth Floor
Honolulu, HI 96813

hand delivered

COMMENTS ON EIS PREPARATION NOTICE - EAST MAUI SOURCE DEVELOPMENT PLAN

Enclosed are comments by the Native Hawaiian Advisory Council ("NHAC") regarding the scope and depth of coverage that the Draft EIS (DEIS) for the proposed East Maui Source Development Plan should have. NHAC is a nonprofit corporation pursuing the protection of Hawaiian Natives' rights. NHAC works to hold the government and law makers accountable for the proper enforcement of the rights and entitlements of Hawaiian Natives and strives to have laws which can be utilized to improve the status of the Hawaiian Native community enforced.

NHAC assisted many East Maui residents in declaring water uses and registering water sources with the State Commission on Water Resource Management. We believe that the DEIS for the proposed project must include reference to these declarations and registrations and assessments of the proposed project's potential impacts upon the water rights, water uses, and affiliated spiritual, cultural, emotional, and economical well-being of Hawaiians in East and Central Maui.

This can best be accomplished by opening all phases and aspects of the EIS preparation process to public involvement. While state law does not require any public contact between the time of this scoping exercise and the publication of the DEIS, we maintain that the fairest and most thorough assessment of potential impacts will occur when local residents are involved in choosing the assumptions, methodologies, and contractors used in compiling the DEIS.

Unfortunately, our concerns about Hawaiian water rights and water uses are not being addressed at the regional level. Parties such as the National Park Service, Keola Hana Maui, Inc., East Maui Irrigation Co., The Nature Conservancy, and the Dept. of Land and Natural Resources have entered into a cooperative management agreement for East Maui watersheds, but representatives of Hawaiian concerns have been excluded from these proceedings. The DEIS must also address this lack of representation and seek means of resolving it so that Hawaiian water rights-holders and water users are involved and can more appropriately influence watershed management policy and participate in the decision-making process.

The DEIS must also consider other legal implications of the proposed project, since it would involve inter-basin transfers of water in areas not formally designated as water management areas (WMA) by the State Water Commission. While the State Water Code expressly allows such transfers within designated WMA, it is otherwise silent on the issue. Hawaii common law currently dictates that these transfers are not allowed. Also of concern is the potential impact of proposed water source developments pon instream flows.

Finally, the DEIS must consider the potential impacts of the proposed project upon the water rights reserved to Hawaiian Home Lands and other ceded lands, especially where water source development would take place on government land. These rights were reconfirmed and strengthened by Act 325 of the 1991 State legislature.

The proposing agency, Maui County, is also in the process of revising its Water Use and Development Plan (MWUDP), a component of the Hawaii Water Plan. Act 325 mandates that the Hawaii Water Plan plan for uses of water on Hawaiian Home Lands by reserving water for their future use. East Maui Source Development is cited in the current draft MWUDP as a part of the county planning strategy. The DEIS must therefore explain the proposed project's relationship with the Maui County Water Use and Development Plan and with the requirements of Act 325.

Finally, we would like to express our concern over the ability of the consultant to adequately address the wide range of issues confronting the EIS. Thus we reiterate our suggestion that all phases and aspects of the EIS preparation process be open to public involvement. Maui people, and especially Maui Hawaiians must be empowered to help formulate the assumptions and methodologies that will be used to perform environmental assessments, and futhermore they must be empowered to influence contractor selection and to be contracted themselves for assessment work.

Perhaps the ultimate solution to this kind of problem is similar to the California approach, in which a state agency similar to OEQC is responsible for actually preparing all environmental assessments. This seems to relieve the inherent unfairness of allowing developers to bring in "hired guns" for EIS formulation.

Thank you for considering our comments in preparing the DEIS. We hope that we will hear from you often before it is published.

Mahalo,

David L. Martin

David L. Martin, Vice-President

pc: Office of the Mayor, County of Maui
County of Maui Department of Water Supply
Norman Saito Engineering Consultants
Water Commissioners
Keanae-Wailuanui Community Association
Hana Community Association
Keanae Taro Growers
Ka Lahui Hawai'i/Maui
Native Hawaiian Legal Corp.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

October 14, 1992

Ms. Patricia Tummons
Environment Hawaii
733 Bishop Street
Honolulu, Hawaii 96813

Dear Ms. Tummons:

RE: EMPLAN DEIS - East Maui Source Development Plan

We are responding to your comments dated July 22, 1992 on the East Maui Source Development Plan Draft Environmental Impact Statement (EMPLAN DEIS). We regret that your comments were not responded to in a more timely manner and apologize for the oversight.

Your concerns have also been expressed by other concerned agencies and individuals, and we feel that we have adequately discussed these comments in the DEIS. The well drilling methodology is described in Chapter IV, Impacts on the Physical Environment, with specific references to sub-section 4.7, Hydrology.

The premise that water source development will spur urban development that otherwise might not take place is addressed in Chapter III, Relationship of the Proposed Project to Existing Public Plans, Policies, and Controls.

Thank you again for your continuing interest and we look forward to your review of the DEIS.

Sincerely,

David R. Craddick
Director

HK:ab
xc: NORMAN SAITO ENGINEERING CONSULTANTS, INC.

"By Water All Things Find Life"

Printed on recycled paper

POSTED 10/8/92

ENVIRONMENT HAWAI`I
733 Bishop Street, Suite 170-51
Honolulu HI 96813

July 12, 1992

County of Maui
Department of Water Supply
200 South High Street
Wailuku HI 96793

'92 JUL 14 P1:05

OFC. OF ENVIRONMENTAL QUALITY CONTROL

Dear Sir or Madam:

RE: East Maui Source Development Plan

I am responding to the EIS preparation notice that appeared in teh July 8, 1992 edition of the OEQC Bulletin.

Any EIS prepared for this project should consider the effects of source development upon the streams of the region and the welfare of native plants and animals dependent upon those streams.

I believe also that the EIS should consider the possibility that increased water supplies in the area might spur urban development that otherwise might not take place. The consistency of such possible development with community plans and county plans should be considered.

Finally, the consistency of any water source development plan with the state's ongoing revisions to the state Water Plan (mandated under Chapter 174C, HRS) must be considered.

Thank you for your attention to these concerns.

Best wishes,

Patricia Tummons, editor
Environment Hawai`i

cc: Office of the Mayor, County of Maui
Office of Environmental Quality Control

CHAPTER XI PARTICIPANTS IN THE PREPARATION OF THE DEIS

The DEIS was prepared for the Department of Water Supply, Maui County by Norman Saito Engineering Consultants, Inc., and Parametrix, Inc. The following list identifies individuals who were involved in the preparation of the DEIS and their respective contributions.

Norman Saito Engineering Consultants, Inc. - Civil Engineering
*Water Resource Associates - Hydrology, Geology

Parametrix, Inc. - Environmental Impact Statement
*Aki Sinoto Consulting - Historical / Archaeological

*** Subconsultant in document preparation**

CHAPTER XII. CONSULTED PARTIES AND COMMENTS RECEIVED

12.1 Consulted Parties

The DRAFT Environmental Impact Statement (DEIS) for the proposed East Maui Water Development Plan was published in the OEQC Bulletin on October 23, 1992. The forty five day review period ended on December 7, 1992. In addition, the DEIS was mailed directly to the agencies and organizations listed below. A total of twenty three comments were received.

Federal Agencies	Date Comment Received
U.S. Department of Agriculture Soil Conservation Service	11-9-92
U.S.Army Corps of Engineers Pacific Ocean Division	11/9/92
U.S.Department of the Interior Fish & Wildlife Service National Parks Service	
U.S. Department of Commerce Nat'l Marine Fisheries Service	
U.S. Department of Transportation Federal Aviation Administration	
U.S. Geological Survey Water Resources Division	
Department of the Navy Naval Base Pearl Harbor	10-26-92
State Agencies	
Dept. of Accounting & Gen.Svcs.	11/9/92
Department of Agriculture	12-7-92
Dept. of Business ,Econ.Develop.& Tourism Energy Division	11/9/92
Department of Defense	12-4-92
Department of Education	
Dept. of Hawaiian Home Lands	

State Agencies	Date Comment Received
Dept. of Land and Natural Resources State Historic Preservation Division	12-7-92
Department of Health Environmental Management Div.	12-7-92
Dept. of Transportation Highways Division Airports Div. c/o Kahului Airport	11-2-92
Office of State Planning	
Office of Hawaiian Affairs	11/9/92
University of Hawaii Water Resources Research Center	
Office of Environ.Quality Control	11-5-92
Univ. of Hawaii, Environmental Center	12-7-92
State Land Use Commission	
Department of Budget and Finance Housing Finance and Development Corporation	12-2-92
Private Sector/ Community Groups	
American Lung Association	
Alexander & Baldwin, Inc. Ms. Meredith Ching	
A & B Properties, Inc.	
C. Brewer Properties, Inc.	
Central Maui SWCD	
Hawaiian Commercial & Sugar Co.	
Maui Electric Company, Ltd.	
Maui Land & Pineapple Co.	
Maui Lani Development	
Hawaiian Electric Company, Inc.	11-6-92

Private Sector/Community Groups	Date Comment Received
The Nature Conservancy	
Hui Alanui O Makena (via Isaac Hall)	12-7-92
Sierra Club	12-7-92
Isaac Davis Hall	12-7-92
Keauhou O Honuaula, Inc. via Isaac Hall	
Landmark Maui Properties	
Maui Tomorrow	12-7-92
Environment Hawaii	7-12-92
Native Hawaiian Advisory Council	8-7-92
Native Hawaiian Legal Corporation	12-9-92

Maui County Government

Planning Dept.	
Dept. of Parks & Recreation	11-17-92
Dept. of Public Works	
Economic Development Agency	
Maui County Council The Hon. Howard Kihune, Chair	

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

December 15, 1992

Lt. Col. Jerry H. Matsuda
Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816

Dear Col. Matsuda:

We are in receipt of your agency comments dated December 3, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development plan. Your "No comments" position is duly noted.

Thank you for your cooperation.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Engineering

"By Water All Things Find Life."

1092.92

JOHN WAIHEE
GOVERNOR

EDWARD V. RICHARDSON
MAJOR GENERAL
ADJUTANT GENERAL

MYLES M. NAKATSU
BRIGADIER GENERAL (HI)
DEPUTY ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

December 3, 1992

Engineering Office

Mr. David Craddick
Board of Water Supply
c/o Department of Water Supply
P. O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr. Craddick:

Subject: East Maui Water Development Plan DEIS

Thank you for providing us the opportunity to review the above mentioned environmental assessment.

We have no comments to offer at this time regarding the project.

Sincerely,

Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contacting and Engineering Officer

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

WILLIAM W. PATY
CHAIRPERSON

JOHN C. LEWIN, M.D.
ROBERT S. HAMATA
RICHARD N. COX, P.E.
GUY E. FUJIMURA

RAE M. LOUI, P.E.
DEPUTY

DEC 22 1992

Mr. David Craddick
Director
Department of Water Supply
P.O. Box 1109
Wailuku, HI 96793-7109

Dear Mr. Craddick:

Draft Environmental Impact Statement for
East Maui Water Development Plan

Thank you for allowing us to review the subject document and we offer the following comments:

Section	Page	Comments
1.3	1	Shouldn't the County's Water Use and Development Plan be part of the rationale?
1.9	4	A Stream Channel Alteration Permit may also be required by our Commission on Water Resource Management (CWRM) relative to the proposed Maliko Gulch crossing and should be included in your listing.
2.3 & 2.3.7	2 & 4	The phased development of 16 MGD of water does not appear to coincide with the projected demands by the Maui County Planning Department (25 to 29 MGD) and the projected demand of 18.6 MGD noted on page 4.

Section	Page	Comments
2.3.1	2	Dan Lum told us that anticipated capacity is 750,000 gpd.
4.7 - 4.7.2	7-8	The current proposal in the East Maui Water Development Plan (EMPLAN) of drilling eleven exploratory wells should replace the conceptual plan of 28 wells reflected in the current review draft of the Maui County Water Use and Development Plan (WUDP). This will help to reduce confusion and questions raised by the general public.
4.7.4 & 7.2	9 2	Current water withdrawal rate of 17 MGD stated in Section 4.7.1 when compared to sustainable yield figures for the Paia and Haiku aquifers listed in Section 4.7.2.a., indicates that water use has already reached 100% of the aquifers capacity and that further groundwater development may not be possible. Use of various figures for sustainable yield of groundwater aquifers has caused confusion with the general public. The State Water Code, authorized the CWRM to establish sustainable yield figures using the best information available to be reviewed periodically. The CWRM always welcomes any information which would enhance our knowledge of water resources in the State and respectfully requests a copy of the "Central Maui Water Study" mentioned in this section.

POSTED 7/13/92

ENVIRONMENT HAWAI`I
733 Bishop Street, Suite 170-51
Honolulu HI 96813

July 12, 1992

County of Maui
Department of Water Supply
200 South High Street
Wailuku HI 96793

'92 JUL 14 P1:05

OFC. OF ENVIRONMENTAL QUALITY CONTROL

Dear Sir or Madam:

RE: East Maui Source Development Plan

I am responding to the EIS preparation notice that appeared in teh July 8, 1992 edition of the OEQC Bulletin.

Any EIS prepared for this project should consider the effects of source development upon the streams of the region and the welfare of native plants and animals dependent upon those streams.

I believe also that the EIS should consider the possibility that increased water supplies in the area might spur urban development that otherwise might not take place. The consistency of such possible development with community plans and county plans should be considered.

Finally, the consistency of any water source development plan with the state's ongoing revisions to the state Water Plan (mandated under Chapter 174C, HRS) must be considered.

Thank you for your attention to these concerns.

Best wishes,

Patricia Tummons, editor
Environment Hawai`i

cc: Office of the Mayor, County of Maui
Office of Environmental Quality Control

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

October 14, 1992

Ms. Patricia Tummons
Environment Hawaii
733 Bishop Street
Honolulu, Hawaii 96813

Dear Ms. Tummons:

RE: EMPLAN DEIS - East Maui Source Development Plan

We are responding to your comments dated July 22, 1992 on the East Maui Source Development Plan Draft Environmental Impact Statement (EMPLAN DEIS). We regret that your comments were not responded to in a more timely manner and apologize for the oversight.

Your concerns have also been expressed by other concerned agencies and individuals, and we feel that we have adequately discussed these comments in the DEIS. The well drilling methodology is described in Chapter IV, Impacts on the Physical Environment, with specific references to sub-section 4.7, Hydrology.

The premise that water source development will spur urban development that otherwise might not take place is addressed in Chapter III, Relationship of the Proposed Project to Existing Public Plans, Policies, and Controls.

Thank you again for your continuing interest and we look forward to your review of the DEIS.

Sincerely,

David R. Craddick
Director

HK:ab
xc: NORMAN SAITO ENGINEERING CONSULTANTS, INC.

"By Water All Things Find Life."

Printed on recycled paper

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

October 14, 1992

Mr. David L. Martin
NATIVE HAWAIIAN ADVISORY COUNCIL
1088 Bishop Street, Suite 1204
Honolulu, Hawaii 96813

Dear Mr. Martin:

RE: EAST MAUI SOURCE DEVELOPMENT PROJECT - EISPN

We are responding to your office's comments dated August 7, 1992 on the subject project as follows:

1. Your concerns over the plight of water rights and uses for Hawaiian is correct and proper for your office to pursue. We have avoided distinguishing between types of users but have maintained a service policy that water is available to all residents of Maui County; and we will continue to provide potable water to all Maui County consumers..

2. We feel that the concerns expressed in the balance of your letter would be more suitable for the Office of Environmental Quality Control, the State Legislature, and certainly the Department of Hawaiian Home Lands. It is our position that we will comply with the overall review procedure for processing of documents under the policy of the State.

Thank you for your comments, and we look forward to your review of the DEIS.

Sincerely,

David K. Craddick
Director

HK:ab
xc: NORMAN SAITO ENGINEERING CONSULTANTS, INC.

"By Water All Things Find Life."

NATIVE HAWAIIAN ADVISORY COUNCIL
A Nonprofit Corporation
1088 Bishop Street, Suite 1204, Honolulu, Hawaii 96813
Telephone (808) 523-1445
Facsimile (808) 599-4380

1992 August 7

'92 AUG -7 P

Office of Environmental Quality Control
220 South King Street
Central Pacific Plaza, Fourth Floor
Honolulu, HI 96813

hand delivered

COMMENTS ON EIS PREPARATION NOTICE - EAST MAUI SOURCE DEVELOPMENT PLAN

Enclosed are comments by the Native Hawaiian Advisory Council ("NHAC") regarding the scope and depth of coverage that the Draft EIS (DEIS) for the proposed East Maui Source Development Plan should have. NHAC is a nonprofit corporation pursuing the protection of Hawaiian Natives' rights. NHAC works to hold the government and law makers accountable for the proper enforcement of the rights and entitlements of Hawaiian Natives and strives to have laws which can be utilized to improve the status of the Hawaiian Native community enforced.

NHAC assisted many East Maui residents in declaring water uses and registering water sources with the State Commission on Water Resource Management. We believe that the DEIS for the proposed project must include reference to these declarations and registrations and assessments of the proposed project's potential impacts upon the water rights, water uses, and affiliated spiritual, cultural, emotional, and economical well-being of Hawaiians in East and Central Maui.

This can best be accomplished by opening all phases and aspects of the EIS preparation process to public involvement. While state law does not require any public contact between the time of this scoping exercise and the publication of the DEIS, we maintain that the fairest and most thorough assessment of potential impacts will occur when local residents are involved in choosing the assumptions, methodologies, and contractors used in compiling the DEIS.

Unfortunately, our concerns about Hawaiian water rights and water uses are not being addressed at the regional level. Parties such as the National Park Service, Keola Hana Maui, Inc., East Maui Irrigation Co., The Nature Conservancy, and the Dept. of Land and Natural Resources have entered into a cooperative management agreement for East Maui watersheds, but representatives of Hawaiian concerns have been excluded from these proceedings. The DEIS must also address this lack of representation and seek means of resolving it so that Hawaiian water rights-holders and water users are involved and can more appropriately influence watershed management policy and participate in the decision-making process.

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Finally, the DEIS must consider the potential impacts of the proposed project upon the water rights reserved to Hawaiian Home Lands and other ceded lands, especially where water source development would take place on government land. These rights were reconfirmed and strengthened by Act 325 of the 1991 State legislature.

The proposing agency, Maui County, is also in the process of revising its Water Use and Development Plan (MWUDP), a component of the Hawaii Water Plan. Act 325 mandates that the Hawaii Water Plan plan for uses of water on Hawaiian Home Lands by reserving water for their future use. East Maui Source Development is cited in the current draft MWUDP as a part of the county planning strategy. The DEIS must therefore explain the proposed project's relationship with the Maui County Water Use and Development Plan and with the requirements of Act 325.

Finally, we would like to express our concern over the ability of the consultant to adequately address the wide range of issues confronting the EIS. Thus we reiterate our suggestion that all phases and aspects of the EIS preparation process be open to public involvement. Maui people, and especially Maui Hawaiians must be empowered to help formulate the assumptions and methodologies that will be used to perform environmental assessments, and futhermore they must be empowered to influence contractor selection and to be contracted themselves for assessment work.

Perhaps the ultimate solution to this kind of problem is similar to the California approach, in which a state agency similar to OEQC is responsible for actually preparing all environmental assessments. This seems to relieve the inherent unfairness of allowing developers to bring in "hired guns" for EIS formulation.

Thank you for considering our comments in preparing the DEIS. We hope that we will hear from you often before it is published.

Mahalo,

David L. Martin

David L. Martin, Vice-President

pc: Office of the Mayor, County of Maui
County of Maui Department of Water Supply
Norman Saito Engineering Consultants
Water Commissioners
Keanae-Wailuanui Community Association
Hana Community Association
Keanae Taro Growers
Ka Lahui Hawai'i/Haui
Native Hawaiian Legal Corp.

JOHN WAIHEE
Governor

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814-2512

YUKIO KITAGAWA
Chairperson, Board of Agriculture

RIMA A. PRAHALA
Deputy to the Chairperson

FAX: 973-9613

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96823-2159

'92 DEC 16 P3:12 25

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI

December 7, 1992

David Craddick, Director
Board of Water Supply
c/o Department of Water Supply
P.O. Box 1109
Wailuku, HI 96793-7109

Dear Mr. Craddick:

SUBJECT: Draft Environmental Impact Statement for East Maui Water Development Plan

The Department of Agriculture (DOA) has reviewed the subject Draft Environmental Impact Statement and has the following comments to offer.

We understand that the planning strategy of the East Maui Water Development Plan (EMPlan) is to draw water from sources not currently used for agricultural purposes. The additional water will originate from the basal aquifer and will not affect water availability to the East Maui Irrigation System.

Thank you for the opportunity to comment.

Sincerely,

Yukio Kitagawa, Chairperson
Board of Agriculture

c: Office of Environmental Control
Carl K. Takumi, Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

RECEIVED
JAN 22 1993

January 13, 1993

Ms. Yukio Kitagawa, Chairperson
Board of Agriculture
Department of Agriculture
State of Hawaii
1428 So. King Street
Honolulu, HI 96814-2512

Dear Ms. Kitagawa:

Subject: EAST MAUI WATER DEVELOPMENT PLAN
Draft Environmental Impact Statement

We inform you that your agency comments postmarked December 9, 1992, were received beyond the 45 day review period which ended December 7, 1992. The comments made have been reviewed and confirm that the additional water will originate from the basal aquifer and will not affect surface water availability to the East Maui Irrigation System.

Thank you for your cooperation.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Engineering

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

RECEIVED
JAN 25 1993

January 7, 1993

Executive Board
Maui Tomorrow
355 Hukilike Street
Wailuku, HI 96793

Gentlemen:

We have received your collective comments dated December 7, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Our consultants have reviewed the comments and have provided these responses for your information:

1. There is consensus that water as a resource is not infinite if squandered and not protected. Further, to willfully destroy the East Maui sources without the benefit of advanced planning and hydrological design, would be contrary to the mandates of the County Board of Water Supply.

2. Secondary impacts that may be attributed to the providing of potable water, are no different than providing sewage treatment, refuse collection and disposal, police and fire protection. The Department does not establish planning policies in it's pursuit of providing water services to the Maui community at large. The County Planning Department and the County Council establish future policies for long term planning and population growth.

Thank you for your continuing interest.

Sincerely,

David R. Craddick

David R. Craddick
Director

HK:sc
cc: Norman Saito Eng.

11/14/92 10:09 002

MAUI TOMORROW

December 7, 1992

'92 DEC -9 A...

Office of Environmental Quality Control

Re.: East Maui Source Development Plan

To all Concerned:

Our concerns remain in two areas which we do not feel have been adequately addressed in this Draft EIS:

1) The resource is not infinate. We request that the resource be fully evaluated, base line data established and the impact of proposed well drilling be determined.

2) Secondary impacts, particularly on growth and development, are in fact part of the project. These must be fully considered in the Final EIS.

We still feel we must have scientifically substantiated and environmentallly sensative plan set forth in the Final EIS.

Sincerely,

Executive Board

cc: Mr. David Craddick, Director
Board of Water Supply

Mr. Carl Takumi
c/o Norman Saito Eng. Consultants Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

January 7, 1993

Mr. John T. Harrison, Ph.D.
Environmental Center
University of Hawaii
2550 Campus Road
Honolulu, HI 96822

Dear Dr. Harrison:

We are in receipt of the Center's comments postmarked December 7, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. our retained civil engineering consultant and the sub-consultant who prepared the DEIS, Parametrix, Inc., have reviewed the comments and prepared the following responses:

1. The discrepancy in the numbering of pages was an error on the part of Parametrix, Inc. and will be corrected in time for the FEIS.

2. The FEIS will be printed on both sides of the pages whenever practicable.

3. Historic and Archaeological Sites: Please understand that the alignments discussed in the DEIS are proposed and not necessarily final in terms of alignment selection. When the final alignment is selected and construction drawings completed and reviewed for building and grading permits, the concerns over the potential presence of significant sites will not be overlooked. This will be especially true of the undisturbed sites along Maliko Gulch. The balance of the proposed alignments which will run in existing highway and agricultural service road rights-of-way, will not be high potential sites.

4. Reallocation of existing Resources:
   a) The Board of Water Supply will review the future long term use of water purchased at the present time from the East Maui Irrigation Company in terms of its' disposition. At this time, it is premature to make this determination. This is a fifteen year project and water demand can change, availability of sustainable yield from the wells can be inadequate to meet demands, and other reasons to maintain the East Maui purchase relationship could take place.
   b) These scenarios will not be examined until a more accurate picture develops with the EMPLAN.

5. General Water Rights: The EMPLAN is a basal water development plan, and no surface water resources will be affected. The declaration and registration of existing water uses is a responsibility of the Commission on Water Resource Management (CWRM) and the CWRM will use this information in carrying out its responsibilities under the State Water Code. Therefore, the need to provide the inventory of registered East Maui residents in the FEIS is unnecessary.

6. The State Water Code:
   a) The EMPLAN is and will be in compliance with all applicable provisions of the State Water Code. This includes the required permitting process and any conditions that the Commission may impose.
   b) The EMPLAN will be consistent with the Maui County Water Use & Development plan, which is a part of the Commission's Hawaii Water Plan.

7. Native Hawaiian Rights:
   a) The EMPLAN is designed and planned to develop basal ground water. No surface water resources will be developed or affected by EMPLAN. Therefore, surface water rights, i.e. riparian, prescriptive, or appurtenant will be affected by the EMPLAN.
   b) The EMPLAN will not adversely affect native Hawaiian water rights as determined by the Commission.

8. SUMMARY:
   The management of water resources, both surface and groundwater, and the allocation of water uses and water rights are the responsibility of the CWRM. The EMPLAN is a basal water development plan with no surface involvement. Consequently, surface water rights including appurtenant, prescriptive, surplus, and riparian, are not an issue of the EMPLAN and the FEIS. The EMPLAN recognizes that there are some existing basal groundwater uses, and the EMPLAM has and will take into consideration any potential adverse impacts on these existing uses.

Thank you for your comments and we look forward to your continuing interest and cooperation.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Eng.

University of Hawaii at Manoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawaii 96822
Telephone: (808) 956-7361

December 7, 1992
RE:0612

Mr. David Craddick
Department of Water Supply
County of Maui
P.O. Box 1109
Wailuku, Hawai'i 96793-7109

Dear Mr. Craddick:

Draft Environmental Impact Statement (DEIS)
East Maui Water Development Plan
Makawao and Wailuku, Maui

The East Maui Water Development Plan (EMPlan) involves the design and installation of water transmission lines, storage reservoirs, and the drilling of source wells. This Plan is designed to meet the needs of the Central Maui Water District for the next 20 years or to the year 2012. It proposes to build a 36 inch transmission main from the East Maui sources to the existing 36 inch Central Maui transmission pipeline near the Kuihelani Highway. Intermediate connections to the Central Maui Water System between Hamakuapoko and the Central Maui Transmission Pipeline are proposed at Pa'ia, Haleakala Highway, and Pu'unene. The transmission line will also be extended east from Hamakuapoko across Maliko Gulch and into the Ha'iku area. Water from the Ha'iku area wells located mauka of this transmission line will be connected to the transmission line after passing through control/chlorine contact tanks. Connections to the control tanks will be made to serve some of lower elevation Ha'iku areas, thus expanding the area served by the Central Maui Water System, and reducing the size of the Makawao District Service Area. Periodic review will be made of the EMPlan to assure the response to changing water demands.

The Environmental Center has reviewed this document with the assistance of Terry Hunt, Anthropology; Yu-Si Fok and Paul Ekern (Emeritus), Water Resources Research Center; David Penn, Geography; and Alex Buttaro, Environmental Center.

Page Numbering

Although the Table of Contents refers to page numbers in terms of Roman and Arabic numbers, only Arabic numbers and section demarcations are

provided on the pages of the text. The numeric system used throughout this document may make it difficult for the reader to reference different sections vis-a-vis the Table of Contents. Why are different numbering conventions used for the Table of Contents and text?

Paper Conservation

Significantly less paper would have been needed had the text been printed on both sides of each page. Incorporating this suggested format would reduce EIS bulk and production costs.

Historic and Archaeological Sites

Our reviewers wish to emphasize that the archaeological mitigation plan should be designed in conjunction with the engineering design. Final planning of the project route should take into consideration the high probability of subsurface cultural remains and human burials that may be encountered during the construction activities in the coastal and dune portions of the pipeline corridor, especially in phases 2 and 5 where previous findings have been recorded (Exhibit A, page 10).

Reallocation of Existing Resources

We understand that the East Maui Irrigation Company presently sells water to the County of Maui and private users.

1) Is it possible that the water presently purchased by the Maui Department of Water Supply and private users will be discontinued or reallocated after development of the proposed resources?

2) In the event that this development may cause reallocation or discontinuation of existing water resources, what potential scenarios exist for the use of such water?

General Water Rights

Many East Maui residents have declared and registered their water uses and sources with the State Commission on Water Resource Management. This EIS should include an inventory of these declarations and registrations where applicable to this project's area, and it should additionally disclose the socioeconomic and "natural" environmental consequences of the project in terms of how the development may affect water rights and the ability to exercise them, and how the natural environment may be impacted by the exercising of such rights.

1) How will this project impact appurtenant water rights?

2) What might be the anticipated impacts upon prescriptive water rights?

3) Might this project affect surplus water rights, and if so, how?

4) What are the anticipated effects of this development upon riparian water rights?

5) In what ways might soverieqn water rights be impacted by this development?

The State Water Code

1) What implications does this project have upon the State Water Code?

2) How might the Hawai'i Water Plan be impacted by this proposed development?

Native Hawaiians

1) What are the anticipated impacts of the proposed project upon the water rights, water uses, and affiliated spiritual, cultural, emotional, and economic well-being of Native Hawaiians in East and Central Maui?

2) How will this project affect Native Hawaiian water rights as prescribed in Section 174C-101 of the State Water Code?

Summary

This document appears to adequately address many of the environmental issues pertinent to the proposed development. However, our reviewers expressed concern that this project may have profound impacts upon the management and allocation of water resources and the ability of various water rights bearers to exercise their rights. The DMPlan also appears to have the potential to directly impact management of water resources by creating alternatives to the present distribution and transmission patterns. These new alternatives may subsequently impact the abilities of rights bearers to exercise their rights, thus constituting an indirect impact. This EIS should address such indirect impacts pursuant to Title 11 EIS Rules, which require that indirect effects shall be discussed because "these secondary effects may be equally important as, or more important than, primary effects" (EIS Rules Section 11-200-17[i]). Because of emerging legal concerns over various water uses and application of rights, our reviewers expressed concern over the absence of a discussion of this project's indirect impacts upon the abilities of rights bearers to exercise previously unutilized rights. This document may be challenged in court. We, therefore, suggest that the aforementioned issues be addressed in a Supplemental DEIS or in the Final EIS. For more information regarding these issues, we refer you to Williamson B. C. Chang of the William S. Richardson School of Law. His expertise in water rights issues may be helpful in preparation of future EIS documents. Additionally, the Native Hawaiian Rights Handbook, published by OHA and the Native Hawaiian Legal Corporation (Mackenzie, 1991), provides useful information regarding various rights associated with both Hawaiian and non-Hawaiian water users.

Thank you for the opportunity to review this document and we hope our comments are helpful.

Sincerely,

John T. Harrison, Ph. D.
Environmental Coordinator

cc: OEQC
County of Maui, Board of Water Supply
Carl Takumi, Norman Saito Engineering Consultants
Roger Fujioka
Terry Hunt
Paul Ekern
Dave Penn
Yu-Si Fok
Williamson B.C. Chang
Alex Buttaro

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

January 14, 1993

RECEIVED
JAN 22 1993

Ms. Charmaine Tavares, Director
Department of Parks and Recreation
County of Maui
1580 Kaahumanu Ave
Wailuku, HI 96793

Dear Ms. Tavares:

Subject: EAST MAUI WATER DEVELOPMENT PLAN

We are in receipt of your agency comments dated November 17, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Development Plan. You "No comment" position is duly noted.

Thank you for your cooperation.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Engineering

DEPARTMENT OF
PARKS AND RECREATION
COUNTY OF MAUI

LINDA CROCKETT LINGLE
Mayor
CHARMAINE TAVARES
Director
ARMAND PADUA
Deputy Director

1580 KAAHUMANU AVENUE, WAILUKU, HAWAII 96793 (808) 243-7230

November 17, 1992

RECEIVED
1992 DEC -9 PM 3:03
DEPT. OF WATER SUPPLY
COUNTY OF MAUI

Board of Water Supply
c/o Department of Water Supply
P.O. Box 1109
Wailuku, HI 96793-7109

Dear Board Members:

SUBJECT: EAST MAUI WATER DEVELOPMENT PLAN

The Department of Parks and Recreation has no comment on this project.

Thank you for the opportunity to review and comment.

Sincerely,

Charmaine Tavares, Director
Department of Parks & Recreation

NO RESPONSE REQUIRED.

cc: David Craddick, Director
Department of Water Supply

Office of Environment Quality Control
220 South King Street
Honolulu, HI 96813

Park Maintenance Division | Recreation Division | Aquatic Division | Zoo & Botanical Gardens | Waiehu Golf Course

XEROX COPY

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

January 7, 1993

Ms. Lisa Hamilton
Maui Group Sierra Club
Wailuku, HI 96793

Dear Ms. Hamilton:

We are in receipt of your group comments dated December 7, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Our consultants have reviewed the comments and have prepared the following responses:

Your concerns over the long term impacts of the EMPLAN are appropriate since the phasing of the EMPLAN is scheduled over a fifteen year time table. As such, there is more than ample opportunity to evaluate potential impacts to the pristine water source areas of up country Maui and more specifically, the ground water sources that could be impacted by improper well drilling.

Present East Maui residents that depend on surface water sources for agricultural purposes will not lose their water rights by this proposed action. Well drilling to reach the basal aquifer will be conducted under strict adherence to engineering and hydrological design controls. Grouting of the well shafts will insure against permanent loss of perched or dike water as the well shaft penetrates through the caprock proper. These techniques have been employed in previous water source developments and are proving to be successful in their preservation of surface water sources.

Finally, the Department does not set planning guidelines or population growth; the County Planning Department and the County Council sets planning growth directions through the various Community Development Plans. The Department like other County departments, provide water, refuse collection, sewage treatment, police and fire protection to meet these established growth patterns.

Thank you for your comments and continuing interest.

Sincerely,

David R. Craddick
Director

HK:sc

"By Water All Things Find Life"

11/14/92 10:10 003

Kimo/file
KM
Please send copies to appropriate parties

SIERRA CLUB, HAWAI'I CHAPTER

MALAMA I KA HONUA

MAUI GROUP

December 7, 1992

'92 DEC -8 A8:4

Office of Environmental Quality
220 S. King Street,
Honolulu, HI 96813

Re.: East Maui Water Development Plan, Draft Environmental Impact Statement.

Dear Sirs:

Less than a century ago, in 1908, the Hana Forest Reserve was established. It contains the water resource of the East Maui Water Development Plan. The original object of the establishment of the reserve was the protection of the streams and their head waters. The object was protection of the water at its course.

The long term impact of drilling of between 11 and 20 wells must be carefully and completely evaluated so that the public and planners alike are assured that 50 or 100 years from now the East Maui Water resource shall not have been exploited such that streams and springs are depleted or degraded.

Stream waters are essential to many endemic and indigenous species. They require continuous undistrubed run of stream flow from sources to the open ocean. Moreover we are concern that high standards of aesthetic quality of streams be preserved.

Water availability is the most significant growth inducer. It is therefore essential that the East Maui Water Development Plan take into account all secondary impacts the plan will have on development, population and environmental degradation throughout the island.

We request complete elucidation of secondary impacts in the long term in the Final EIS.

cc: Mr. David Craddick, Director
Board of Water Supply
Mr. Carl Takumi, c/o Norman Saito Eng. Consultants, Inc.

Thank you

Conservation Chair.
Maui Group, Sierra Club

Lisa Hamilton

COPY

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

P. O. BOX 50004
HONOLULU, HAWAII
96850

November 9, 1992

Mr. Brian Choy, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

NOV 12 1992

Dear Mr. Choy:

Subject: Draft Environmental Impact Statement (DEIS) - East Maui Water Development Plan, Makawao and Wailuku Districts, Maui

We have reviewed the above DEIS for the East Maui Water Development Plan and have no comments to offer at this time.

Thank you for the opportunity to review this document and we would appreciate it if we could review the Final EIS.

Sincerely,

Warren M. Lee

WARREN M. LEE
State Conservationist

cc:
Mr. David Craddick, Director, Board of Water Supply, c/o Department of Water Supply, P.O. Box 1109, Wailuku, Hawaii 96793-7109
Mr. Carl K. Takumi, Norman Saito Engineering Consultants, Inc., Wailuku Townhouse, Suite 203, 2158 Main Street, Wailuku, HI 96793-1671

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

- 2 1992

Mr. Warren M. Lee
U.S. Dept. of Agriculture
Soil Conservation Service
P. O. Box 50004
Honolulu, HI 96854

Dear Mr. Lee:

We are in receipt of your agency comments dated November 9, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Your agency position of "No Comment" is duly noted.

Thank you for your timely response and continuing interest and cooperation.

Sincerely,

For David R. Craddick
Director

HK:sc

cc: Norman Saito Eng.✓

"By Water All Things Find Life."

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

COPY

IN REPLY REFER TO

11010
Ser N42/3533
26 OCT

Mr. David Craddick
Director
Board of Water Supply
c/o Department of Water Supply
P. O. Box 1109
Wailuku, HI 96793-7109

Dear Mr. Craddick:

EAST MAUI WATER DEVELOPMENT PLAN

We have reviewed the Draft Environmental Impact Statement (DEIS) and have no further comments to offer. Since we have no further use for the DEIS, it is being returned to the Office of Environmental Quality Control (OEQC). Thank you for the opportunity to review the DEIS.

Sincerely,

W. L. Liu
Assistant Base Civil Engr
By direction of
the Commander

Copy to:
Mr. Carl K. Takumi
c/o Norman Saito
Engineering Consultants, Inc
Wailuku Townhouse Suite 203
2158 Main Street
Wailuku, HI 96793-1671

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

Mr. William K. Liu
Naval Base Pearl Harbor
NAVFACENGCOM
P. O. Box 110
Pearl Harbor, HI 96860-5020

Dear Mr. Liu:

We are in receipt of your agency comments dated October 26, 1992 offering "No Comment" on the draft Environmental Impact Statement prepared for the East Maui Water Development Plan.

Thank you for your timely response and continuing cooperation.

Sincerely,

for David R. Craddick
Director

HK:sc

"By Water All Things Find Life"

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

REPLY TO ATTENTION OF

October 28, 1992

COPY

Planning Division

NOV - 2 1992

NORMAN SAITO ENGINEERING CONSULTANTS INC

Mr. David Craddick, Director
Maui County Department of Water Supply
P.O Box 1109
Wailuku, Maui, Hawaii 96793-7109

Dear Mr. Craddick:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the East Maui Development Plan (various tax map keys). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. A Department of the Army (DA) permit may be required for work in wetlands. Please contact the Operations Division at 438-8555 prior to finalizing the route alignments.

b. A flood hazard evaluation will be prepared once the route alignments have been finalized.

Sincerely,

Kisuk Cheung, P.E.
Director of Engineering

Copy Furnished:

Mr. Carl K. Takumi
Norman Saito Engineering Consultants
2158 Main Street, Suite 203
Wailuku, Maui, Hawaii 96793-1671

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

Mr. Kisuk Cheung, P.E,
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, HI 96858-5440

Dear Mr. Cheung:

We are in receipt of your agency comments dated October 28, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Plan. We respond as follows to your comments:

A. All DA permit requirements for this proposed project will be reviewed and permit applications prepared and filed with your agency as soon as final alignments are established. We will be in contact with the Operations Branch prior to finalizing the alignment corridors.

B. We understand that once the alignment corridors are final, the flood hazard evaluation can be finalized.

Thank you for your timely response and continuing cooperation.

Sincerely,

David A. Craddick
Director

HK:sc

"By Water All Things Find Life."

JOHN WAIHEE
GOVERNOR

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

ROBERT P. TAKUSHI
COMPTROLLER

LETTER NO. (P)1893.2

Mr. David Craddick
Board of Water Supply
c/o Department of Water Supply
County of Maui
P. O. Box 1109
Wailuku, Maui, Hawaii 96793-7109

Dear Mr. Craddick:

Subject: East Maui Water Development Plan
Makawao and Wailuku, Maui
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RY:jk
cc: Department of Water Supply, County of Hawaii
Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

Mr. Gordon Matsuoka
State Public Works Engineer
Department of Accounting & General Services
P. O. Box 110
Honolulu, HI 96810

Dear Mr. Matsuoka:

We are in receipt of your agency comments dated October 27, 1992 on the draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Your "No Comments" offer is duly noted.

Thank you for your timely response and continuing cooperation.

Sincerely,

David K. Craddick
Director

HK:sc

"By Water All Things Find Life"

Printed on recycled paper

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
BARBARA KIM STANTON
Deputy Director
RICK EGGED
Deputy Director
DUKE SHE YOSHIKARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 PHONE: (808) 587-3800 FAX: (808) 587-3829

October 23, 1992

Mr. David Craddick, Director
Board of Water Supply
c/o Department of Water Supply
P. O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr. Craddick:

Subject: East Maui Water Development Plan
Island of Maui, Makawao & Wailuku District
Tax Map Key Numbers: Various in Zone and Sections:
2-5, 2-5:03, 2-5:04, 2-5:05, 2-7, 2-7:03, 2-7:07, 2-7:08, 2-7:09, 2-7:10, 2-7:11, 2-7:13, 2-7:16, 2-7:17, 2-7:18, 2-7:19, 2-7:20, 3-8, 3-8:01, 3-8:06, 3-8:07, 3-8:51, 3-8:59, 3-8:61, 3-8:70, 3-8:71,

We wish to inform you that we have no comments to offer on the subject Draft Environmental Impact Statement (DEIS). We are returning the DEIS with no comments.

Thank you for the opportunity to review the document.

Sincerely,

for Mufi Hannemann

MHK:hkeis53

cc: Office of Environmental Quality Control
Department of Water Supply
Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

Mr. Mufi Hanneman, Director
Department of Business, Economic
Development & Tourism
Energy Division
335 Merchant Street, Room 110
Honolulu, HI 96813

Dear Mr. Hanneman:

We are in receipt of your agency comments dated October 23, 1992 offering "No Comment" on the draft Environmental Impact Statement prepared for the East Maui Water Development Plan.

Thank you for your timely response and continuing cooperation.

Sincerely,

for David A. Craddick
Director

HK:sc

"By Water All Things Find Life"

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

Mr. Rex D. Johnson, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Johnson:

We are in receipt of your department's comments dated November 2, 1992 on the draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Your stated response of "No change" from the earlier comments made during the EISPN are duly noted.

Thank you for your timely response and continuing cooperation.

Sincerely,

David K. Craddick
Director

HK:sc

"By Water All Things Find Life"

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
JOYCE T. OMINE
AL PANG
JEANNE K. SCHULTZ
CALVIN M. TSUDA

IN REPLY REFER TO:
STP 8.4880

November 2, 1992

RECEIVED
NOV - 6 1992

COPY

Mr. David Craddick, Director
Board of Water Supply
c/o Department of Water Supply
P. O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr. Craddick:

Subject: Draft Environmental Impact Statement
East Maui Water Development Plan

Thank you for sending us a copy of the draft environmental impact statement for the East Maui Water Development Plan. Our July 17, 1992 comments on the earlier environmental assessment for the proposal (enclosed) are still applicable.

We appreciate this opportunity to provide comments.

Sincerely,

Rex D. Johnson
Director of Transportation

Enc.

c: OEQC
Mr. Carl K. Takumi, Norman Saito Engineering Consultants, Inc.

STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 586-3777
FAX (808) 586-3799

October 21, 1992

Mr. David Craddick, Director
Board of Water Suppy
C/O Department of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Re: East Maui Water Development Plan

Dear Mr. Craddick:

We have received a copy of theDraft Environmental Impact Statment (DEIS) for above-referenced Development Plan. Thank you for the opportunity to review this DEIS. At this time, we have no concerns or comments on this matter.

If you have any questions, please contact Lynn J. Lee in our Land and Natural Resources Division at 586-3777.

Sincerely,

Richard K. Paglinawan
Administrator

cc: Clayton Hee
Chair, Board of Trustees

1992 OCT 23 PM 2:54
RECEIVED
BOARD OF WATER SUPPLY
COUNTY OF MAUI

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 23, 1992

Mr. Richrd K. Paglinawan
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813-5249

Dear Mr. Paglinawan:

We are in receipt of your agency comments dated October 21, 1992 offering "No Comment" on the Draft Environmental Impact Statement prepared for the East Maui Development Plan.

Thank you for your timely response and continuing cooperation.

Sincerely,

David R. Craddick
Director

HK:ac

"By Water All Things Find Life"

JOHN WAIHEE
GOVERNOR

BRIAN J. J. CHOY
Director

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

COPY

November 5, 1992

Mr. David Craddick
Director
Board of Water Supply
c/o Department of Water Supply
P. O. Box 1109
Wailuku, Hawaii 96793-7109

NOV 13 1992

Dear Mr. Craddick,

SUBJECT: EAST MAUI WATER DEVELOPMENT PLAN

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the above-named project. We have no comments to offer at this time.

Sincerely,

for Brian J. J. Choy
Director

BC:km

NO RESPONSE REQUIRED

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

November 25, 1992

- 2 1992

Mr. Brian J. J. Choy, Director
OEQC
220 S. King Street, 4th Floor
Honolulu, HI 96813

Dear Mr. Choy:

We have received your office comments dated November 5, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Your office position of "No Comment" is duly noted.

Thank you for your timely response and continuing interest and cooperation.

Sincerely,

for David R. Craddick
Director

HKtac

cc: Norman Saito Eng.

"By Water All Things Find Life."

11/09/92 10:22

009
1242.HB

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

December 7, 1992

LOG NO.: 6398
DOC NO.: 9212AG18

Mr. David Craddick, Director
Board of Water Supply
c/o Department of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr. Craddick:

SUBJECT: Historic Preservation Review of the Draft Environmental Impact Statement (DEIS) for the East Maui Water Development Plan
Makawao and Wailuku Districts, Maui
TMK: 2-7 and 3-8

Thank you for the opportunity to review this document.

Item 4.12 (HISTORICAL AND ARCHAEOLOGICAL SITES) of this document states that an archaeological survey was conducted by Aki Sinoto Consulting and that the report is attached as Exhibit A. We believe that this item is not adequate; a summary presenting the survey findings is not included. According to the report, no evidence of historic sites were found. It also indicated the possibility of encountering subsurface remains during excavation for the waterline along the coastal corridor, which follows existing roads.

A section on probable impact and proposed mitigation should also be added to item 4.12. Although no historic sites were identified, the report recommends archaeological monitoring during excavation in the corridors for Phases 2 and 5, the areas which were determined to have the possibility of encountering subsurface cultural deposits. We concur with the report's recommendation.

Finally, we reviewed the report and we determined it to be adequate and acceptable.

Should you have any questions about these comments, please contact Ms. Annie Griffin at 587-0013.

Sincerely,

for DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

c: Department of Water Supply
Mr. Carl K. Takumi, c/o Norman Saito Engineering

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

December 11, 1992

RECEIVED
DEC 14 1992

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Nautral Resources
33 S. King Street, 6th Floor
Honolulu, HI 96813

Dear Mr. Hibbard:

We are in receipt of your comments dated December 7, 1992 on the Draft Environmental Impact Statement (DEIS) prepared for the East Maui Water Development Plan. Our consultant firm has reviewed your comments and confirms that the archaeological consultants will comply with the request to provide a summary presenting the survey findings. This will be amended to the survey and also, the section on probable impact will be added to section 4.12.

Your determination of the report as adequate and acceptable is appreciated. Thank you for your continuing interest and cooperation.

Sincerely,

for David R. Craddick
Director

HK:sc
cc: Norman Saito Engineering Consultants, Inc.
Parametrix, Inc.

"By Water All Things Find Life"

1792.171

JOHN WAIHEE
GOVERNOR OF HAWAII

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

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:

December 7, 1992

92-391/epo

Mr. David Craddick, Director
Board of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793

Dear Mr. Craddick:

Subject: Draft Environmental Impact Statement for
East Maui Water Development Plan

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer:

The provisions of the Department of Health Administrative Rules, Chapters 11-42 and 11-43 currently apply only to the island of Oahu. However, mitigative measures should nevertheless be implemented toward minimizing noise disturbances from the construction activities.

If you should have any questions, please contact Mr. Jerry Haruno of the Noise and Radiation Branch at 586-4701.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

c: Noise and Radiation Branch
Office of Environmental Quality Control
Norman Saito Engineering Consultants, Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-2109

December 15, 1992

RECEIVED
DEC 17 1992
NORMAN SAITO ENGINEERING CONSULTANTS, INC.

Dr. John C. Lewin, M.D.
Department of Health
P O Box 3378
Honolulu, HI 96801

Dear Dr. Lewin:

We have received your department comments dated December 7, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Our consultant engineers have provided the following responses for your information:

For those portions of the proposed alignment that may encroach on inhabited areas, the general contractor will be directed to mitigate construction related noise to the best practicable technology. Fortunately, the alignment under consideration is almost entirely on existing State, County, and agricultural service road rights-of-way.

Thank you for your continuing interest.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Engineering

"By Water All Things Find Life."

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DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

December 7, 1992

Mr. William Bonnet
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, HI 96840

Dear Mr. Bonnet:

We are in receipt of your agency comments dated November 6, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan. Your agency position of "No Comment" is duly noted.

We will be working with HECO during the design and construction plan phase of the project for service requirements.

Thank you for your timely response and continuing interest and cooperation.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Engineering

William A. Bonnet
Manager
Environmental Department

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0

192077

November 6, 1992

Mr. David Craddick, Director
Department of Water Supply
P.O. Box 1109
Wailuku, HI 96793-7109

Dear Mr. Craddick:

Subject: Draft Environmental Impact Statement (DEIS) for
East Maui Water Development Plan
County of Maui Department of Water Supply
Wailuku, Maui, Hawaii

We have reviewed the subject DEIS, and have no comments on the proposed development plan. HECO shall reserve further comments pertaining to the protection of existing power lines bordering and servicing the project area until construction plans are finalized.

Sincerely,

1417.1CD

JOHN WAIHEE
GOVERNOR

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:
92:PPE/5741jt

92 DEC -7 PM 2:21

December 2, 1992

Mr. David Craddick, Director
Board of Water Supply
c/o Department of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr. Craddick:

Re: Draft Environmental Impact Statement for the East Maui Water Development Plan

Thank you for the opportunity to review the subject report. We have no comments to offer.

Sincerely,

JOSEPH K. CONANT
Executive Director

c: Office of Environmental Quality Control
Mr. Carl Takumi

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

December 10, 1992

DEC 14 1992

Mr. Joseph K. Conant, Executive Director
State of Hawaii
Department of Budget and Finance
Housing Finance and Development Corporation
677 Queen Street, Suite 300
Honolulu, HI 96813

Dear Mr. Conant:

We are in receipt of your agency comments dated December 2, 1992 on the Draft Environmental Impact Statement prepared for the East Maui Water Development plan. Your agency position of "No Comment" is duly noted.

Thank you for your timely response and continuing interest and cooperation.

Sincerely,

David R. Craddick
Director

sc

cc: Norman Saito Engineering

"By Water All Things Find Life."

Section	Page	Comments
4.8.1.3	10	It is not clear that the proposed development will have no impact on streams. Many of the streams in East Maui are perennial, and basal groundwater as well as dikes are the sources for these streams. It is evident from the Kuhiwa Well experience that we have fully saturated rocks and not a perched spring situation. If this is also true where the wells are being proposed, groundwater withdrawal will affect streamflow regardless of the casing depth.

We appreciate the opportunity to comment on the subject document and would like to request that the Commission on Water Resource be included in your reviewing agencies for the final environmental impact statement.

If additional clarification is required, please call Eric Hirano of my staff at 587-0261.

Sincerely,

RAE M. LOUI
Deputy Director

cc: Office of Environmental
Quality Control
Mr. Carl Takumi
c/o Mr. Norman Saito
Engineering Consultants, Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

January 29, 1993

FEB - 5 1993

Ms. Rae M. Loui, Deputy Director
Department of Land and Natural Resources
Commission on Water Resources Management
P. O. Box 621
Honolulu, HI 96809

Dear Ms. Loui:

Subject: DLNR/CWRM comments on the Draft Environmental Impact Statement prepared for the East Maui Water Development Plan (EMPLAN)

We have received your agency comments dated December 22, 1992 on the proposed EMPLAN DEIS and the consulting engineering firm on record, Norman Saito Engineering Consultants, Inc. has assisted in preparing the following responses.

	Section	Page	Response
1.	1.3	1	The EMPLAN conforms to the Maui County Water Use Development Plan. The EMPLAN is a more detailed development plan for the Central Maui Water System.
2.	1.9	4	A Stream Channel Alteration Permit will be made during the design phase of the project. At that time, the Maliko Gulch crossing location will have been selected. The listing in Section 1.9 has been revised to include this requirement.
3.	2.3 & 2.3.7	2&4	The EMPLAN conforms with the Maui County Planning Department projected demand. The Maui County Planning Department projected demand of 25 to 29 MGD is in terms of average daily demand; the EMPLAN projected average daily demand is close to the unconstrained demand at 30.5 MGD. The 18.6 MGD demand projected is in terms of maximum daily demand.

4.	2.3.1	2	The pumping capacity of the wells must be based upon actual test pump data and other aquifer information at the well site. The anticipated pumping capacity of the wells in the EMPLAN is based upon known hydrological and geological information based upon other wells in the area.
5.	4.7-4.72	7-8	The number of wells indicated is based on the anticipated pumping capacity and will be subjected to amendment as the exploratory wells are tested. Based on the most current information, the Maui County Water Use and Development Plan (WUDP) may be updated to minimize confusion. The current withdrawal rate of 17 MGD for the Central Maui Water System is from the Iao Aquifer and not the Haiku or Paia Aquifers. Therefore, a substantial portion of the sustainable yield for the Paia and Haiku Aquifers as described in the State Water Protection Plan remains unused.
6.	4.7.4	9	The DEIS states that the estimated sustainable yield of the Haiku Aquifer is 15 MGD. This estimate is quoted from the Central Maui Water Study, part II, pgs. 4-6 and B-3. References to sustainable yield estimates of 15 MGD and 31 MGD are also taken from pg. V-21, "Water Resources Protection Plan, Volume 1, CWRM, March 1992". As explained in the 1990 and 1992 CWRM reports, the estimated sustainable yield of 31 MGD is based upon original hydrological conditions occurring prior to the diversions by the East Maui ditch system of perched ground water flowing into streams. The 15 MGD is a conservative estimate derived from a water balance in which ditch flow is subtracted (Central Maui Water Study, Part II, pg. B-3). All of the 15 MGD is developable from basal groundwater (pgs. V-21 and 142 "State Water Resources Protection Plan", June 1990 and March 1992).

7.	7.2	2	In the section on Alternative Source Consideration, the discussion of sustainable yield is specifically a summary of the Waihee Aquifer. In accordance with your request, a copy of the "Central Maui Water Study" will be sent to the CWRM.
8.	4.8.1.3	10	Perennial streams in the eastern part of the Haiku-Honopou area are more related to the occurrence of abundant mauka rainfall and a thick (100 to 150 ft.) formation of weathered andesites and andesitic basalts (Kula volcanic series) having low to moderate permeabilities. These two hydrogeologic conditions give rise to the occurrence of significant amounts of perched ground water in the Kula formation. The streams, which have eroded into the Kula formation, serve as natural drains for the perched ground water which result in perennial streamflows. Below the Kula formation, older, permeable basalts of the Honomanu volcanic series occur. Unlike the Kuhiwa Well situation, the Kula and underlying Honomanu formations (between the coast and at least three to four miles inland) are not fully saturated. This conclusion is first based upon observations of unsaturated rock conditions above a near sea level basal groundwater table in several wells in the Haiku area: Hamakuapoko 1 (5420-01), Hamakuapoko 2 (5340-02), Upper Haiku (5419-01), Haiku School (5519-01), and Baldwin Manor (5519-03). Secondly, no perennial flows or seepages are known to occur in Haliko Gulch. Haliko Gulch, which has eroded some 200 feet deep into the Kula lavas, is the deepest gulch within the Project area. In summary, the proposed water development plan will have no impact on any steamflows in the Haiku area because it consists entirely of basal water development having no effect on any perched groundwater (which feed some of the streams in the area) or any high level, dike confined ground water (which is not known to occur in the Haiku area).

Thank you for your comments and we trust that our responses will be of help.

Sincerely,

David R. Craddick
Director

HK:sc

cc: Norman Saito Eng.

NATIVE HAWAIIAN LEGAL CORPORATION
[illegible] QUEEN EMMA STREET • SUITE [illegible] • [illegible] HAWAII [illegible] • TELEPHONE (808) 521-2302 • FAX (808) 537-[illegible]

December 7, 1992

County of Maui, Board of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Re: Draft EIS for East Maui Water Development Plan (EMPLAN)

Gentlemen:

Comments on the above-captioned document (the "DEIS") are as follows:

§ 1.8 at p. 4. Alternatives considered; see also § 7.2, at p. 2-3. The alternatives to the project as proposed in the DEIS include: (a) Developing the Waihee Aquifer; (b) Desalination; (c) Surface Water. Each of these is rejected for various reasons. With regard to alternative (c), the DEIS states that "The social unacceptability of taking [surface] water from agricultural users is not a high priority consideration for the Department. Planned sharing of basal aquifer sources is more equitable." This statement does nothing to explain the rejection of this alternative, other than to suggest that it was rejected without analysis because the Department considered it inequitable for unspecified reasons. Without a reasoned explanation, rejection of this alternative can only be regarded as arbitrary and capricious, thus rendering the DEIS unsatisfactory. This is particularly so in light of the fact that reduced sugar production over the period of the EMPLAN may well make available for municipal use much of the private and State-owned water now obtained through the East Maui Irrigation Co. (EMI) system. The EMPLAN Final EIS (FEIS) should describe the current use of EMI water within and in the vicinity of the Central Maui Water System Service Area and should address the use of EMI water freed up for municipal use as a result of decreased sugar cultivation as a substitute for water proposed to be obtained from new wells under the EMPLAN. Without such an analysis, it is unreasonable, arbitrary, and capricious to reject the "no action" alternative.

§ 4.8.1.2, at p. 10. Fauna. The discussion of affected fauna is seriously deficient. The reported occurrence of the Hawaiian Hawk in the study area is highly unlikely, given the fact that this listed endangered species is normally considered to be restricted in range to the Island of Hawaii. The improper

terminology used for other bird species[1] suggests strongly that no trained biologist was involved in the preparation of this portion of the DEIS, nor does the list of "Participants in the Preparation of the DEIS" provided in Chapter XI identify any party responsible for this portion of the report. Although the DEIS states that "no endangered bird or mammal species were observed in the project's alignment," the absence of any description of the biological field surveys conducted, if any, makes it impossible to determine whether those surveys were adequate to detect such species if they did in fact occur within the project area. It may be that the area is too disturbed to support endangered bird or mammal species; in the absence of any description of the manner in which the reported biological data were obtained, however, it is impossible to determine the validity of the conclusions presented. If no on-the-ground surveys were conducted, this fact should be clearly stated.

§ 4.8.1.3, at p. 10. Aquatic Resources. The DEIS concludes, based on the opinion of a consultant, Water Resources As[s]ociates ["WRA"], that the project will have no adverse effect on aquatic resources because streams will not be affected by the project. The full text of the report or other statement of WRA should be provided with the DEIS as an appendix, along with the archaeological consultant's report. Without access to the full report, it is impossible for reviewers to determine the validity of the conclusory statement provided in § 4.8.1.3 that no adverse effects will result.

The DEIS should also provide a description of native stream fauna in streams within the project area based on recent field survey data, including in particular the occurrence, if any, of the o'opu Lentipes concolor, a native fish which is now under consideration for listing under the Endangered Species Act.

Chapter VIII, at 1. Irreversible and Irretrievable Commitments of Resources. This section notes that "the potential impacts [of the project] to high level water by the exploratory well drilling," are among the "unavoidable impacts" of the project, yet elsewhere the DEIS declares there will be no impacts on high level water. See, e.g., § 4.8.1.3, Aquatic Resources. If such impacts may indeed occur, contrary to the assurances contained in § 4.8.1.3, their nature and extent must be disclosed. Concern regarding the project's impacts on streamflow is heightened by the fact that, as noted above, the hydrology consultant's report is not included as an attachment to the DEIS.

[1]For example, the "common gray dove" is an unknown species, and nomenclature for other species (Kentucky cardinal, English sparrow) differs from that normally used for these species by professional ornithologists.

Comments related to letters from reviewers of the EISPN:

(1) In a letter dated August 4, 1992, from Esther Ueda of the Land Use Commission, it was recommended that a map be provided delineating the project area and relevant State Land Use Districts. Ms. Ueda also noted certain proposed changes in land use district boundaries. Although Mr. Craddick's August 14, 1992, response to Ms. Ueda's letter included a statement that a map of land use district boundaries would be included, no such map is referenced in § 4.2, Surrounding/Adjacent Land Uses. Figure 1, cited therein, does not provide such information. This information would be useful to readers of the FEIS, and such a map should be prepared and included in that document.

(2) A&B Hawaii, in a letter dated July 20, 1992, asks whether well sites have been identified, and the identity of affected landowners. This information is of considerable uyse to public reviewers and should be provided in the FEIS, as it is apparently absent from the DEIS. In particular, any use of State-owned lands as well sites should be identified, so that the issue of proper compensation to the Department of Hawaiian Home Lands and the Office of Hawaiian Affairs for the use of State-owned Ceded Lands and water resources, if any, can be addressed.

(3) Comments by Mr. Isaac Hall, in his letter of August 5, 1992, suggest that the DEIS may be improperly "segmenting" the County's East Maui water development projects by addressing only a portion of the County's anticipated water developments in that area. Improper segmentation occurs when an EIS addresses only a part of a larger coordinated plan or project. Accordingly, the FEIS should describe related County projects which are logically connected with the present project and must describe the cumulative effects of these developments as a whole. Mr. Hall also addresses the absence of consideration of stream fauna in the EISPN, a deficiency that was not rectified in the DEIS as submitted for review. See comments on § 4.8.1.3, above.

Thank you for this opportunity to comment on the DEIS.

Very truly yours,

CARL C. CHRISTENSEN
Staff Attorney

cc: County of Maui, Department of Water Supply ✓
OEQC
Norman Saito Eng. Cons., Inc.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

June 2, 1993

Mr. Carl C. Christensen
NATIVE HAWAIIAN LEGAL CORPORATION
1270 Queen Emma Street, Suite 1004
Honolulu, Hawaii 96814

Dear Mr. Christensen:

SUBJECT: EAST MAUI SOURCE DEVELOPMENT PROJECT
DEIS RESPONSE

We respond to your comments as follows:

1. §1.8 at Page 4

There is no current evidence that A & B, Inc.'s sugar plantation will reduce its production within the near future so that water sources may become available for Municipal use. The EMPLAN is a flexible water development program. If water sources do become available in the future during the course of the EMPLAN, then the Department of Water Supply will evaluate whether it will be prudent to continue with the EMPLAN or pursue the then available water sources, taking into consideration cost-benefit studies, environmental issues, and socio-economic problems, quantity of then available water sources, etc.

2. §4.8.1.2 at Page 10

Botanical and Fauna Surveys have been performed and will be included as Appendix D and E of the FEIS. No endangered botanical or mammal species were observed along the project's proposed alignment.

3. The report by Water Resource Associates will be attached to the FEIS. A copy of the report is enclosed herewith for your reference.

The EMPLAN proposes source development of basal ground water lens and therefore, no surface water resources will be affected including perennial streams. Hence, no description of native stream fauna is included.

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4. Chapter VIII at 1.

The probable impact of encountering high level perched water during well drilling is described in the DEIS as temporary and that each well as a precaution "will be cased with solid steel casing from the ground surface to sea level elevation and the annular space between the casing and drill hole will be grouted with cement, sealing off any high-level perched ground water..." Thus the nature and extent of the probable impacts have been disclosed.

5. Comments.

(1) Land Use District Boundary information will be included in the FEIS.

(2) The well sites in the Haiku area have not been definitively established as yet.

(3) The EMPLAN is the only source development program in East Maui that the Department is pursuing for the Central Maui Water System.

Thank you for your comments and we look forward to your continuing interest and cooperation.

David Craddick, Director
DEPARTMENT OF WATER SUPPLY

Enclosure

cc. Norman Saito Engineering Consultants, Inc.

ISAAC DAVIS HALL
ATTORNEY AT LAW
2087 WELLS STREET
WAILUKU, MAUI, HAWAII 96793
(808) 244-9017
FAX (808) 244-8778

OF COUNSEL:
G. RICHARD GESCH

December 7, 1992

Mayor Linda Crockett Lingle
Office of the Mayor, County of Maui
200 S. High St.
Wailuku, HI 96793

Re: Comments on the Draft EIS for the East Maui Water Development Plan

Dear Mayor Linda Crockett Lingle:

I represent the Coalition to Protect East Maui Water Resources ("the Coalition"), an unincorporated association whose members are primarily residents of the East Maui area within which wells are proposed to be developed pursuant to the East Maui Water Development Plan ("EM Plan"). A number of the Coalition's members have water rights registered with the State of Hawaii which could be significantly adversely affected by the EM Plan. On their behalf, I have the following comments on the Draft Environmental Impact Statement ("DEIS") for the EM Plan.

I. GENERAL COMMENTS / SUMMARY

The DEIS is totally inadequate and must be redrafted. It flagrantly violates the content requirements for Draft EISs found within Chapter 343 HRS and this state's Environmental Impact Statement Rules, §11-200-1 et seq. (hereafter "Rules"). There has been no serious effort to satisfy even the minimal requirements for a DEIS: identifying environmental concerns, obtaining relevant data, conducting necessary studies or proposing measures for minimizing adverse impacts, for example. See the Rules, §11-200-14. As such, the DEIS is meaningless and self serving. It has not been an early open forum for the discussion of adverse affects and available alternatives. It cannot possibly enlighten decision-makers to the environmental consequences of the proposed action. See Rules, §11-200-14.

The DEIS has been prepared in great haste. The Preparation Notice was published in the OEQC Bulletin dated July 8, 1992. The notice of the availability of the DEIS for comment was published in the OEQC Bulletin dated November 8, 1992. The DEIS was prepared in a four month period. Most other DEISs for projects as significant as this one take over one year to prepare.

The length of preparation time is not, in and of itself, a reason for declaring this DEIS inadequate. However, this short preparation time only highlights the facts that necessary data was not collected, necessary studies were not conducted and there was no rigorous scientific investigation of the costs and benefits of this proposed action.

In this regard, agencies, including the Maui County Board and Department of Water Supply, are directed by law to incorporate environmental analysis early in their planning processes. This was not done in this case. A fully planned East Maui Water Development Plan had been presented for approval by the Board of Water Supply ("BWS") before an Environmental Assessment ("EA") or EIS had been prepared. A letter objecting to this violation of Chapter 343 was submitted on February 24, 1992. This letter is attached as Exhibit "A".

Later, the BWS decided to prepare an EIS. Over our objections, the BWS, without competitive bidding, hired Norman Saito Engineering Consultants, Inc. to prepare the DEIS even though Mr. Saito's firm had conducted most of the planning studies to date and thereby had a conflict of interest.

II. NO DESCRIPTION OF THE ENVIRONMENTAL SETTING

The DEIS contains no description of the environmental setting. §11-200-17(g) of the Rules states:

> The Draft EIS shall contain a description of the environmental setting, including a description of the environment in the vicinity of the action, as it exists before commencement of the action, from both a local and regional perspective.

By ignoring a description of the environmental setting, the DEIS avoids studying the impacts of the proposed action within the context of this environmental setting. Basic components of this environmental setting which should have been studied follow:

A. The existence of perennial streams

A simple drive within the area affected by the proposed action would have disclosed the existence of perennial streams. Anyone driving through Haliko Gulch, along the old Haiku Road and up Peahi Road would drive into and out of many gulches which contain perennial streams.

This is important because, according to the State's "Water Resources Protection Plan," virtually all perennial streams receive base flow from groundwater. Direct runoff from rainfall is discharged in streams within two days after the rainfall. The remaining "base flow" is fed by groundwater.

The obvious conclusion is that these perennial streams may be adversely affected by wells drawing from groundwater sources in the area. To avoid this analysis, the DEIS does not inventory streams in the project area, even though their existence is shown on the USGS maps which are used as exhibits in the DEIS.

No effort was made to study the flow in these streams. This data would have disclosed that these streams are perennial and would have served as a source of baseline data for the analysis of the adverse impacts caused by pumping groundwater.

B. Early Native Hawaiian uses

A walk up and down the gulches containing the perennial streams within the project area would have disclosed evidence of early Native Hawaiian uses of these gulch lands. Most of these gulches contain remnants of lo'i (taro patches) and house sites. A basic study of the land tenure in the area would show that kuleanas exist within these gulches providing further evidence of the Native Hawaiian occupation of these areas.

This information is vital in the DEIS because it demonstrates the existence of long-standing riparian and appurtenant water rights with respect to the perennial streams. The BWS has an absolute constitutional and statutory duty to protect riparian and appurtenant water rights. See Article XI of the State Constitution. The DEIS has made no effort to collect data and disclose information on the existence of Native Hawaiian appurtenant and riparian water rights within these gulches.

C. Plantation stream diversions

The DEIS contains no information on the extent to which these perennial streams have already been diverted. The State Water Resources Protection Plan, Volume II, page D10, shows the major plantation stream diversions in the Koolau Aquifer System on Maui. See Exhibit "B". It shows that East Maui streams are diverted at the 1,300 foot elevation by the Koolau Ditch; at the 1,200 foot elevation by the Wailoa/New Hamakua Ditch; at the 1,000 foot level by the Kauhikoa Ditch; at the 650 foot level by the Lowry Ditch and at the 450 foot level by the Manuel Luis/Center/Haiku Ditch. Fully 164 mgd is

already diverted from East Maui Streams, including those within the project area, for irrigation uses by the HC&S Plantation and for municipal uses by the County of Maui.

It was recently discovered that the greatest impact on stream flow that occurred from pumping groundwater by the Kuhiwa Well in Nahiku was in the diminishment of the amount of water collected through these stream diversion ditch systems. One potential impact that should have been studied in the DEIS is the extent to which pumping of this groundwater will diminish the amount of water collected by the stream diversions in the project area. It may well be, as it was with respect to Kuhiwa Well, that the project simply increases one water source by diminishing another.

D. Groundwater development

There are existing wells within the project area. No effort has been made to analyze the impact of these ten new wells on these existing wells. The DEIS fails to disclose that there already exists a dispute between the owner of one of these wells, Mr. Gerald Hokoana, and the BWS concerning the impacts of the existing Haiku Well (and perhaps the two new proposed wells) on Mr. Hokoana's well.

There has been no effort to identify the extent to which others in the project area may wish to drill wells and utilize the same water resources which the BWS wishes to take now.

The DEIS contains minimal information on the extent of the groundwater resources available for development in the project area. The State's "Water Resources Protection Plan" indicates that the sustainable yield for the Haiku Aquifer System is estimated at 15 mgd. See Exhibit "C". If this estimate is correct, the EH Plan would take and transmit elsewhere virtually all of the available groundwater resources in the Haiku Aquifer System leaving none for future uses in the area.

In addition, the State Commission on Water Resources Management has begun to apply the concept of "developable yield" instead of "sustainable yield." Sustainable yield is a figure which does not take into consideration waters that must be withheld for other purposes, including but not limited to riparian, appurtenant and correlative water rights and for in-stream values. Riparian and appurtenant water rights have been discussed to some extent above. The DEIS contains no analysis of correlative water rights.

Correlative water rights are the rights of landowners to the groundwaters below their property. The DEIS does not contain any discussion of correlative water rights. It does

not analyze whether or not the BWS has any correlative water rights to take groundwater from the Haiku "Aquifer." It does not analyze the competing rights of other landowners in Haiku to the groundwater resources in the area.

Further, the DEIS states that the purpose of the project is to take between 10 and 16 mgd from the Haiku region to central Maui. By state law, there is no authority for such a transference unless the area has been formally designated by the Commission on Water Resources Management. This area is not so designated.

E. Registered water rights

Upon the enactment of the State Water Code, those exercising riparian, appurtenant, correlative and other water rights were required to register these rights with the State of Hawaii. The purpose of this registration was to protect water rights and to aid the state in inventorying existing, protectable and lawful uses of water throughout the state.

The DEIS makes no effort to collect data concerning those persons or entities holding registered water rights in the project area. The BWS is in no position to conclude that sufficient water resources exist in the Haiku "Aquifer" without having collected data on registered water rights in the area. Once existing, registered water rights are accounted for, there is no guarantee that there are sufficient water resources available for this project. While a "sustainable yield" might technically be available, the "developable yield" might not.

F. Existing and future proposed uses of water resources within the locality

The water resources of the Haiku region are to be exploited and transferred for use throughout the Central Maui Water System, providing service to the area from Makena to Maalaea to Waihe'e to Kuau and back to Makena.

The East Maui Water Development Plan (9/92) estimates that the maximum day water demand (mgd) for the Haiku/Pauwela, Kuiaha and Kokomo/Kaupakalua service areas, by the year 2012, will be .48 mgd. Of the 10 to 16 mgd exploited, only .48 mgd will be reserved for local uses. This document states on page A-5 that:

> The totals are low when compared with the total water consumed, comprising less than 1% of the Central Maui Water System and less than 2% of the Makawao system.

This disclosure provides a sense of scale and the minimal extent to which this project is designed to satisfy local water needs. Approximately 20-32 gallons of water will leave the Haiku region for every gallon of water that is reserved for use within the region.

The DEIS does not accurately assess the existing and future needs for water in the Haiku region. The DEIS does not assess the extent of current reliance upon the current exercise of riparian and appurtenant water rights. It makes no effort to assess future needs for riparian, appurtenant and correlative water. No effort has been made to realistically quantify the amount of water which should be reserved for the very long-term future.

G. In-stream values

The State Water Code requires that "in-stream" values be protected. The DEIS collected no data and conducts no studies on the in-stream values for the streams within the study area.

The State Commission on Water Resource Management has adopted interim stream flow protection standards. For all of the streams within the study area, the Commission has determined that existing levels of stream flow are to be protected and cannot be diminished. The DEIS contains no information on the existing stream flows for streams in the area. The USGS has data from its gaging stations for some streams on Maui.

One study which should have been conducted as part of the DEIS process was to establish gaging stations on the potentially affected streams to determine current stream flow, to provide baseline data establishing that amount of water which must remain in these streams for in-stream purposes. The Commission on Water Resource Management, in its Water Resources Protection Plan, states that this information should be collected in the first week of October and the last week of February to provide data on high and low flows. This was not done here.

H. Marine resources

There is no discussion in the DEIS concerning marine resources in the area. A significant proportion of the 10-16 mgd which the project would remove from a relatively small area would otherwise discharge into the ocean. Marine flora and fauna rely to some extent on the availability of this fresh water for survival. Although properly requested, the DEIS makes no effort to collect data or conduct studies on marine resources in the area which may be adversely affected by the project.

III. HYDROLOGIC CHARACTERISTICS OF THE PROJECT

A. Estimate of sustainable yield

The State's "Water Resources Protection Plan" makes it abundantly clear that insufficient information exists with respect to the yields in aquifers with the exception of a few aquifer systems, in particular on Oahu and West Maui (page 99). Without any reliable history of the dynamics of an aquifer, such as the Haiku "Aquifer," hydrologic budgeting is employed to provide broad approximations of water balances concerning what water flows into an aquifer and what water flows out of an aquifer.

Fundamental factors which must be addressed are (1) the amount of rainfall, (2) the amount of stream runoff, (3) actual evapotranspiration and (4) the remaining deep infiltration to a saturated aquifer. Once rainfall, stream runoff, evapotranspiration are all measured, the amount of infiltration into the saturated aquifer can be approximated. This document is replete with disclaimers as to the unreliability of these estimates and states, on page 122:

> The sustainable yield estimate should not be equated to feasibly developable water, either technically or economically.

Nevertheless, the state's conservative estimate of 15 mgd must be used "until a better water balance is derived."

B. The interrelationship between ground and surface waters

Perhaps the grossest and most far reaching error contained in the DEIS is its unsupported conclusion in §4.8.1.3 that stream flows would not be affected by the development of groundwater resources. This conclusion has been discredited and rejected throughout the State of Hawaii. Abundant evidence exists that pumping groundwater can indeed affect stream flow. Two examples should suffice. The Honolulu Board of Water Supply decided to further develop groundwater resources on the windward side of O'ahu. When it did so, taro growers, relying upon stream flows, found their crops were harmed. A lawsuit was filed. It was determined that the pumping of groundwater diminished stream flow, harming the taro. See Reppun v. Board of Water Supply, 65 Haw. 531 (1982).

More recently, the Commission on Water Resources Management permitted Maui Land and Pineapple Co. to install a pump and pump groundwater from the Kuhiwa Well in Nahiku. Concerned members of the public intervened. Pumping was allowed based upon monitoring of the stream flow and an assessment of information regarding stream flow by a

committee of interested individuals. The data collected has indicated the groundwater pumping has diminished stream flows diverted and transferred by the East Maui Irrigation Company in the Wailoa Ditch.

The elemental principles of water budgeting provide that some rainfall is discharged through stream runoff and the remainder percolates to groundwater aquifers. If this percolation did not take place, how would there be groundwater in the first place?

The State's "Water Resources Protection Plan" makes it absolutely clear that the base flow in streams is derived from groundwater. It states, on page 176, that:

> ... the groundwater component of stream flow sustains the ecology dependent on running water, and in many regions is a vital source of irrigation supply. Most wetlands also survive because of groundwater seepage.

The existing available evidence contradicts the conclusion in the DEIS. The only support contained in the DEIS for this conclusion is the following:

> Concerns on the potentially adverse impacts to existing streams and high level water endowed areas due to the well drilling have been reviewed by Water Resources Associates, a Honolulu-based consultant. Their response to the questions of potential impacts to rivers, streams, and other sources of high level water were primarily that there would be little concern.

This is hearsay. There is no written analysis by Water Resources Associates, or anyone else, supporting this conclusion. There is no citation in the DEIS for any document or study which supports this conclusion. The Rules require that a rigorous and scientific examination of the impacts of a project be undertaken. The Rules also require that all sources relied upon must be disclosed and be readily available to the public. Neither of these standards are met.

The importance of this deficiency is that the DEIS relies upon this verbal statement to avoid studying the impact on stream flow of taking 10-16 mgd from the Haiku region, hence the impact on those with riparian and appurtenant water rights and the impact on in-stream values.

C. The Coalition's hydrologic consultants

Because of the myriad technical deficiencies in the information contained in the DEIS, the Coalition retained its own consultants to review the DEIS.[1] Hydrologists Brad A. Finney and Robert Willis of Hydro Resources International ("HRI") of Arcata, California were retained as consultants fpr the Coalition to review the hydrologic aspects of the DEIS. Their initial review has resulted in the comments which are attached as Exhibit "D".

First, HRI indicates that the DEIS provides insufficient detail on the hydrology and geology of the study area and, in result, it is not possible to make even a preliminary estimate of the degree of impact that the proposed well field will have on surface and groundwater quality and supplies.

The Coalition consultants indicate that the impact of the development on surface waters can be determined without actually pumping the groundwater by using simple models of the groundwater system.

Data from pumping the wells nearest completion in the area could also supply empirical data establishing impact on surface waters.

The State "Water Resources Protection Plan" recommends that in each aquifer system in which substantial groundwater development is under way, there should be "a deep monitoring test well" which penetrates through the fresh water lens into underlying water (page 9). A project of this magnitude must incorporate within it such a deep monitoring test well.

The Coalition consultants also express misgiving with regard to the effects of the proposed well field on groundwater quality, how optimal the "optimal pumping centers" actually are and the discussion on "water conservation."

The report concludes:

> In summary, the Draft EIS presents a groundwater development plan with very little supporting information to validate its hydrologic potential. There is (1) no quantitative discussion about the probable impacts of the development plan on groundwater or surface water, (2) no data defining the formation parameters and the potential for development and (3) no analysis indicating that the proposed 10 mgd target is at all related to the sustainable yield of the groundwater system.

This leaves even the most technical aspects of this project in question.

IV. INADEQUATE PROJECT DESCRIPTION

A. The Central Maui Water Project

The EM Plan is the outgrowth of Maui's first great public works system. A joint venture was agreed upon among several of Maui's large landowners and developers. 16 million gallons a day were developed from West Maui water resources and transmitted in a 36 inch pipeline to the Kihei area. The development and transmission of these water resources played a significant role in inducing the type of growth which has taken place in the Kihei/Makena area. A simple truth is learned here. Any area towards which a 36 inch transmission line is pointed is an area which will then experience tremendous population and growth impacts.

The Rules acknowledge the extent to which public works projects stimulate or induce secondary effects. Section 11-200-17(i) states:

> It should be realized that several actions, in particular those that involve the construction of public facilities or structures, e.g., highways, airports, sewer systems, water resources projects etc., may well stimulate or induce secondary impacts. These secondary effects may be equally important as, or more important than, primary effects, and shall be thoroughly discussed to fully describe the probable impact of the proposed action on the environment. (Emphasis added.)

The DEIS denies that the EM Plan will induce growth. This kind of denial is not permitted by the Rules.

The joint venturers for the Central Maui project are each entitled to a certain amount of water. Because the water transmitted to Kihei/Makena was devoted to other projects before the joint venturers received their respective allocations, the joint venturers are now claiming publicly before the BWS an entitlement to future water resources developed, including those water resources developed through

---

[1] It must be noted here that the engineers working for the DWS and those who have worked preparing the DEIS have all been paid for with taxpayers' money. Those seeking information vital to the environmental analysis of a proposed action should never be forced to retain their own consultants to overcome the deficient work of those paid for with taxpayers' money.

the EM Plan. The DEIS should acknowledge this commitment of the Haiku water resources. It is simply untrue to state that these water resources are being developed simply to respond to the needs created by development allowed in our community plans.

The BWS has a duty, superior to its obligations to the earlier joint venturers, to supply water for Hawaiian Homes lands. There is a tremendous need for water in Kula and Kahikinui for Hawaiian Homes lands. Why then are these water resources directed to Kihei/Makena instead of to Kula and Kahikinui if this project is not being designed, in part, to satisfy the demands of the earlier joint venturers?

B. Development of the EM Plan

The BWS has decided to devote substantial resources to developing East Maui waters without having fully developed the resources available in the Waihe'e area. While development of the remaining Waihe'e water resources is mentioned as an alternative in the DEIS, this alternative is not rigorously explored or objectively evaluated in the DEIS.

The full scope of the EM Plan is not disclosed. The project was originally described as one to develop as many as 29 wells in an area moving progressively eastwards of the Haiku "Aquifer." The BWS has modified this plan to its current plan. However, the BWS makes it clear that as more water resources are needed, more wells will be developed moving in the eastward direction. The BWS, hence, has committed itself to a policy of relying on East Maui water resources to meet the water demands created in the area from Makena to Maalaea to Waihe'e to Kuau to Makena, and perhaps beyond.

The impacts of this agency action are nowhere discussed in the DEIS. Through the current action, the BWS will, for all practical purposes, monopolize the groundwater resources of the Haiku Aquifer system. Through the implementation of this policy, the BWS apparently intends, when more water is necessary, to exploit the groundwater resources of the Honopou Aquifer system, the Waikamoi Aquifer system and onwards toward Keanae.

This policy subjects to the same areas the extensive dewatering of its streams through the five ditch systems of the East Maui Irrigation Company as well as the monopolization of its groundwater resources. Separately each have severe environmental impacts. The DEIS never acknowledges the cumulative impacts of both systems in the same areas. The DEIS should have studied the impact of the dewatering of the streams in the area through the surface diversions of EMI when combined with the exploitation of the

groundwater resources as proposed here. Enough water has already been taken from the streams in the area without indirectly taking more of this water through groundwater development.

V. ANALYSIS OF THE IMPACTS OF THE PROJECT IS INADEQUATE

The DEIS focuses on issues which are not significant and neglects to study those which are significant. It has not identified the resources which are at risk. These are those noted in §II above. It has not included enough information about the project to allow a full evaluation of its impacts. See Rules §11-200-17(e)(6). It then fails to state the probable impacts of the project on these resources. See Rules §11-200-17(i).

It is not as if consulting parties did not direct attention to these resources. See Exhibit "E".

VI. THE DISCUSSION OF ALTERNATIVES IS INADEQUATE

The DEIS does not contain a discussion of all known alternatives which could feasibly attain the objectives of the action. It does not contain a rigorous exploration of all reasonable alternative actions with a review of the costs and benefits of each of these, as is required by the Rules. The entire discussion of alternatives, often called the "lynch pin" of environmental analysis, is confined to 1-1/2 pages.

VII. INADEQUATE DESCRIPTION OF APPLICABLE LAND USE CONTROLS

The DEIS does contain a discussion of the consistency of this project with a limited number of objectives and policies contained in several state and county plans. It fails to address major issues contained in the Maui County General Plan regarding managing growth and "concurrence."

Its growth projections providing the basis for this action are way beyond those which would be included in any growth management plan adopted by the County. A project of this magnitude should not be adopted until the County has enacted its growth management plan.

The major flaw in this section of the DEIS is that the system of controls which is most directly relevant to this project -- the State Water Code and the regulations promulgated thereunder -- have been totally ignored.

The DEIS never mentions the constitutional duty to protect water resources found in Article XI, §7 of the Hawaii State Constitution which provides:

> The state has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people.
>
> The Legislature shall provide for a water resources agency which, as provided by law, shall set overall water conservation, quality and use policies; define beneficial and reasonable uses; protect ground and surface water resources, watersheds and natural stream environments; establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources.

The State Legislature subsequently enacted the State Water Code in Chapter 174C HRS. It provides, as a declaration of policy, that the Code shall be liberally interpreted and that adequate provision shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of the waters of the state for various other purposes. See HRS §174C-2(c). Instream uses are defined in §174C-3.

The State Water Code also calls for the adoption of a Hawaii Water Plan, one component of which must be a water resources protection plan. See HRS §174C-31. The most recent draft of the "Water Resources Protection Plan," dated March, 1992, contains 28 recommendations. See attached Exhibit "F". This project must be analyzed within the framework of the recommended objectives.

It is readily apparent that this project has been planned and analyzed without any attempt to comply with a significant number of these 28 recommendations for protecting water resources.

VIII. THE DEIS FAILS TO CONSIDER MITIGATION MEASURES TO MINIMIZE PROJECT IMPACTS

The DEIS is deficient in one of its primary functions which is to help devise mitigation measures to minimize the impacts of the project. First the DEIS fails to acknowledge the impact of groundwater development on surface flow and then it fails to include mitigation measures which could prevent or minimize these adverse impacts. Primary mitigation measures might be (1) to collect baseline data concerning all potentially affected streams; (2) to compile data on these streams while test pumping takes place; (3) to establish a committee of individuals in the area with water rights and

the County to monitor these impacts and (4) to establish a system to assure that pumping will cease if stream flow is diminished.

IX. CONCLUSION

This DEIS cannot satisfy the tests for an adequate document. It must be rewritten. Necessary data must be collected; necessary studies must be undertaken. The comment period should then be reopened.

Sincerely yours,

Isaac Hall

IH/jp
cc: Mr. David Craddick
Norman Saito Engineering
East Maui Coalition

decision-making points, suggested deadlines for decision-making and action and/or any government records indicating when an Environmental Assessment will be prepared or when and how environmental factors will be incorporated into decision-making; (i) All minutes of all meetings of the Board of Water Supply discussing which surface and groundwater resources to be developed next and/or where these water resources should be allocated and/or how these water resources should be transmitted from the source to the selected projects or areas.

5. Suggestions

Planning and decision-making for this project has clearly progressed to the point where no further meetings or hearings should be scheduled on this project until an Environmental Assessment has been prepared. To avoid duplication and later delays, environmental factors should be integrated into this process now and not later. I am taking the time now to detail the concerns of my clients because an opportunity still exists here to restructure the planning and decision-making process to avoid duplication and delay.

I do not believe that my clients' concerns are "premature." The project was described to you in great detail by your consultants. You discussed the number of wells that would be constructed, where these water resources would be transmitted and the precise location of the water transmission pipeline. These are all matters which require environmental analysis. I suspect that the Negative Declaration which has been issued is limited simply to the single exploratory well which is being drilled and that no environmental analysis has yet taken place on the other issues raised above.

You may place this letter on the agenda of the Board of Water Supply if you so choose. I certainly request that this letter be placed on the Board's agenda before or at the same time the Board next places this project on its agenda or discusses this project in any way.

Thank you for your continued cooperation. If you have any questions about any of the above, please do not hesitate to contact me.

Sincerely yours,

Isaac Hall

III/jp

cc: Keauhou o Honuau'ula, Inc.
Hui Alanui o Makena

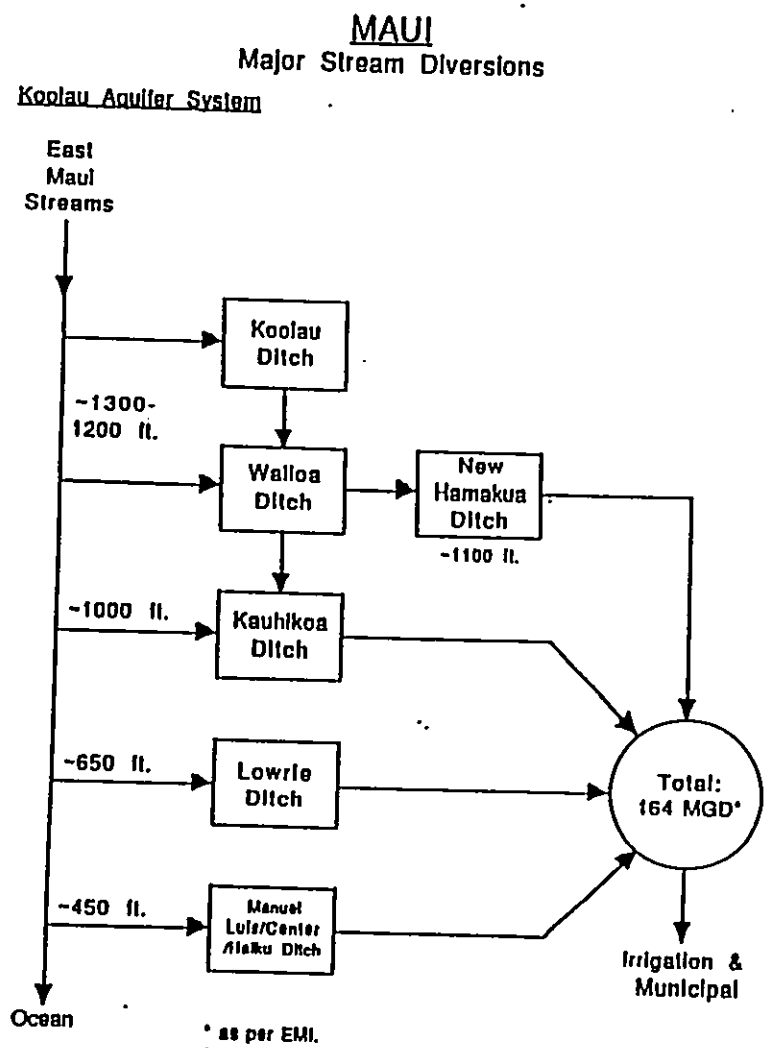

EXHIBIT "B" D10

Haleakala. Spotty accumulations of sediments along the coast do not act as a caprock.

The sustainable yield of 11 mgd is based on total natural input to the basal water portion. It refers to potable water, providing extraction is by means of small capacity wells at considerable distance inland. The estimate is speculative; no exploration has taken place beyond a mile or so from the coast.

Aquifer Sector: Koolau

Aquifer System: Haiku[604011

Basal, high level dike and high level perched groundwater occurs in the System. The whole of the region is covered by Kula volcanics. The principal developable groundwater in the seaward three to four miles is basal, mostly restricted to the Honomanu basalt. Substantial perched water occurs in the Kula formation. Much of this water is captured by the ditch system of the East Maui Irrigation Company. High laval dike groundwater lies far below the ground surface in the Honomanu volcanics.

The estimated sustainable yield of 31 mgd (note: the estimate of 40 mgd in the original table is incorrect because of an arithmetical error) is based on original hydrological conditions before the capture of perched water by the ditch system. A more conservative estimate of 15 mgd is preferred until a better water balance is derived. All of this sustainable yield is potable and developable from the basal groundwater. The

EXHIBIT "C"

estimate is poor in spite of the fact that several wells have been drilled in the System.

Although a sedimentary caprock does not rim the coast, the Kula series locally behaves as variably effective caprock that retards discharge from the basal lens in the underlying Honomanu volcanics.

Aquifer System: Honopou[604021

Only surface water resources are understood to some degree because of the collection ditches that transfer water to central Maui. No exploration has yet been done for basal groundwater. The region is covered by the Kula volcanics. However, for about a mile inland basal water is likely to saturate underlying Honomanu basalt. Sedimentary caprock is absent at the coast, but the Kula may behave as a weak caprock in places.

Perched groundwater in Kula volcanics drains to streams, which are diverted to the ditch system. High level dike water occurs far inland in the Honomanu basalt but at great depth.

For original pre-ditch conditions, estimated sustainable yield of potable basal groundwater is 29 mgd. The estimate is highly speculative.

Aquifer System: Waikamoi[604031

Perched high level groundwater in the Kula series, which mantles the System, extends all the way to the coast. Basal groundwater in the basement of Honomanu basalt probably occurs in

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OF COUNSEL:
G. RICHARD DESCH

February 24, 1992

Mr. David Craddick, Director
Department of Water Supply
County of Maui
200 S. High Street
Wailuku, HI 96793

Re: Development of water resources in East Maui and their transmission to the Wailuku/Kahului and Kihei/Makena regions

Dear David Craddick:

Thank you for notifying me of the last meeting of the Board of Water Supply ("Board") during which a workshop was held on the latest draft prepared by Norman Saito Engineering Consultants ("Saito") with respect to the development of East Maui water resources and their transmission to the Central Maui and Kihei/Makena regions ("the project"). Would you kindly notify me of any further meetings of the Board during which this project will be discussed in any fashion.

1. Scope of project.

The development of groundwater resources in Waiehu and the construction of the Central Maui Transmission Line carrying them to Central Maui and the Kihei/Makena area constituted the first great expansion of the Maui water system. We were informed by your consultants at the last meeting that the Waiehu wells can currently produce for transmission around 16 million gallons per day ("mgd"). These water resources were committed, in most part, to the Kihei/Makena area. We have all witnessed the adverse direct and secondary impacts which have resulted from this project in the form of a construction boom in the area, population increases, competition for public recreational resources, the destruction of historic sites and traffic congestion, for just a few examples.

The Board and Department of Water Supply ("Department") are now planning the second great expansion of this system. We all heard your consultants say that they hoped to develop another 16 mgd in groundwater resources and to construct a transmission system carrying these resources from their source to the Central Maui and Kihei/Makena areas. Board members were clearly informed that this system would double the water resources available to be transmitted in the Central Maui transmission line to the Kihei/Makena area. The project will cost $50.5 million. Having witnessed what occurred after the first great expansion of our water system, it must be obvious to all involved that the same kind of significant direct and secondary adverse impacts will be caused by this second expansion.

Substantial public policy and water policy issues are involved, including but not limited to the following: (a) what water resources should be developed next, e.g. should more wells be constructed in Waiehu, should the groundwater resources of the Haiku region or some other region be tapped?; (b) to which regions of Maui should these water resources be transmitted, e.g. Kula, Upcountry, Central Maui, Lahaina, Kihei, Makena, Hawaiian Homes lands and for what purpose, e.g. resort development or affordable housing? and (c) after issues (a) and (b) are decided, where between the water sources and the areas to be served should the transmission line be located and what should its capacity be.

This second expansion of our water system must be treated as a single action for environmental purposes. The development of the water resources, the decision to deliver them to particular areas and the construction of a transmission line are phases, increments or components of a larger total undertaking which must be treated as a single plan of action or agency action. It would violate our environmental laws to proceed with small increments of this total larger undertaking without reviewing at the earliest practicable time the significance of environmental impacts, including the overall, cumulative impact; related actions in the region; and further actions contemplated. See §11-200-5(a) of the Environmental Impact Statement Rules of the Department of Health ("Rules").

2. The failure to integrate environmental factors into the current planning and decision-making process.

To all those who attended the last meeting of the Board, it was apparent that the Board and the Department have progressed quite far in the planning and decision-making process for the second expansion of the water system. This is evidenced by the following: (a) the construction of a test well in the Haiku area; (b) the contract let to Saito to study the development of water resources in the Haiku region and their transmission to Central Maui and the Kihei/Makena areas; (c) the three drafts detailing a project to develop Haiku water resources and transmit them to Central Maui and the Kihei/Makena region have been presented to the Department and the Board for discussion and review; (d) that each new draft has been a refinement of the earlier draft based upon

EXHIBIT " A "

decision-making by the Department and the Board with respect to the development of the Haiku water resources and their transmission to Central Maui and the Kihei/Makena area; (e) the latest draft which proposes a specific six-phase project to construct ten wells in Haiku, the construction of a transmission line in a particular location and the transmission of this water to specific locales at an estimated cost of $50.5 million and (f) full discussion by the Board on developing these ten wells, the locales which would be served by this system and the specific location of the transmission line.

Chapter 343 does not require Environmental Assessments ("EA") for feasibility or planning studies for possible future programs or projects which the agency has not yet approved, adopted, or funded. In this case, funds have been released to construct the exploratory well; however the environmental impacts of the project as a whole have never been studied. Even if the Board or Department is only reviewing feasibility or planning studies for possible future programs which have not yet been implemented, the Rules clearly require that the agency:

> ... shall consider environmental factors and available alternatives and disclose these considerations in any assessment and subsequent statement. Rules §11-200-5(d).

The Minutes of the last Board meeting will disclose that alternatives were discussed -- however, solely in terms of economic factors. No social or environmental factors were considered.

Parallel federal regulations make it clear that environmental review procedures must be integrated within existing planning and decision-making procedures. This is required to avoid the delays caused by duplicating this planning and decision-making process later in order to incorporate environmental analysis.

3. Lack of public participation

The Board and Department have been perfecting their plan of action and making decisions about the water resources to be developed, the regions to be served and the particular location of the transmission line through successive refinements of a document being prepared by Saito. I have asked to be provided with a copy of this document only to be informed that it is not available to the public. The second expansion of the Maui County water system is being planned based upon a document which members of the public are not being allowed to review.

Agencies are required to assess proposed actions at the earliest practicable time in order to assure thoughtful and deliberate evaluation in determining the significance of various environmental impacts. This assessment must take place subsequent to the conception of an agency-proposed action, but prior to the adoption of a plan of action. In this assessment process, "the agency shall consult with other agencies having jurisdiction or expertise as well as citizen groups and individuals." Rules §11-200-9(a). The Department and Board are hindering this consultation process by refusing to make available these drafts to members of the public or citizen groups and individuals.

All government records must be open to public inspection and duplication during regular business hours, according to HRS 92F-11. This is necessary to open up government processes to public scrutiny and because public participation is the only viable and reasonable method of protecting the public's interest. Access to government documents can only be disallowed if access would constitute a clearly unwarranted invasion of personal privacy. See HRS §92F-2. Government records mean information maintained by an agency in written, auditory, visual, electronic, or other physical form. The burden of proof is upon an agency to establish a justification for non-disclosure. See §92F-15(c). After reviewing the section with respect to exceptions to the general rule (§92F-13) and the section with regard to clearly unwarranted invasions of personal privacy (§92F-14), I can see no basis for refusing to make available the Saito drafts which the Board has been studying.

4. Request for government records.

May I formally request that your agency make available for public inspection and duplication during regular business hours any and all government records with respect to the following: (a) The contract, and any amendments thereto, between the board or agency and Saito; (b) Any permits or approvals applied for or obtained to construct wells, exploratory or otherwise, or to install pumping equipment in wells in the Haiku region; (c) Any applications for permits or approvals or any permits or approvals to construct a transmission line between the Haiku region and other areas; (d) The development of new surface or groundwater resources on the island of Maui to meet current and future needs for drinking water in Maui County; (e) The development of water resources in the Haiku region; (f) Environmental Assessments, Negative Declarations or Notices to Prepare an Environmental Impact Statement for the development of water resources in the Haiku region and/or their transmission elsewhere; (g) All communications, reports, plans, in draft form or otherwise, between Saito and the County of Maui; and (h) All descriptions of the decision-making process, critical

HYDRO RESOURCES INTERNATIONAL
HRI
WATER RESOURCES & WATER QUALITY SYSTEMS
613 PARK AVENUE - ARCATA, CALIFORNIA, U.S.A. 95521 - 707/822-6674

December 3, 1992

Issac Davis Hall, Esq.
Attorney at Law
2087 Wells Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Hall

As requested we have completed an initial review of portions of the Draft EIS for the County Department of Water Supply's East Maui Water Development Plan. We have also reviewed sections of the report *Well Exploration and Development, East Maui Source Development*, by Norman Saito Engineering Consultants, and the Central Maui Water Study II, that you supplied as supplemental documents.

The comments associated with the technical review of the documents are enclosed. We can summerize the review by stating that the draft EIS provides insufficient detail on the hydrology and geology of the study area. As a result, it is not possible to make even a preliminary estimate of the degree of impact that the proposed well field will have on surface and ground water quality and supplies. It does appear that if the wells are properly constructed, surface stream flows should not be impacted at the 700 foot elevation that the proposed wells are to be constructed. However, it is possible that the well field would have an impact on the volume of surface streamflow at lower elevations nearer the ocean, where interaction between the surface and ground water systems may be more significant. A determination of the potential for impacts on streamflow from groundwater pumping would require more comprehensive study than the available data allows.

It is also not possible to determine the effects of the proposed well field on groundwater quality with the very limited data available. Given the financial commitment associated with the project, it would seem prudent to invest more effort initially in project planning. We suggest as a first step obtaining data that characterize the hydrologic, hydraulic, and recharge properties of the the aquifer. Relationships can then be developed that can be used to assess the hydraulic response of the aquifer to pumping. At this point, it would then be possible to evaluate how optimal the "Optimal Pumping Centers" (Map 2, East Maui Source Development, Norman Saito Engineering) actually are.

We must also reiterate our view that the draft EIS is flawed at the outset since the alternatives considered did not include demand reduction via water conservation. Recent court rulings have upheld the concept of demand reduction as a valid alternative to increasing supply even when the community did not wish to consider such an alternative. Given the rate of growth in water demand in Maui, and the problems that the County has had with wastewater treatment, water conservation using mandatory retrofit of toilets and showerheads with low flow devices is a winner from all angles. The cost of implementing these conservation programs has been shown in other communities to be less than developing new supplies. Water quality benefits result since the demands on overloaded wastewater treatment plants are reduced (or the margin of growth at underloaded facilities is extended). Since less water is needed, the potential impacts of overdrafting the groundwater basin are reduced. Finally, the citizens of Maui benefit since the low flow toilets and showerheads pay for themselves in reduced water and electric bills within three to five years.

Should you have any questions or need to discuss our comments, please do not hesitate to contact us at (707)826-3918.

Sincerely

Brad A. Finney
Senior Engineer

Robert Willis
Senior Engineer

EXHIBIT " D "

FAX: (707) 826-3616

Review Comments on the Draft EIS for the East Maui Water Development Plan

1. The safe yield of the aquifer system is a function of the hydraulic properties and boundaries of the aquifer system (Bredehoeft et al., 1982). The magnitude of sustained groundwater pumpage depends on how much of the natural discharge can be captured by the proposed well field development. There only discussion in the Draft EIS and supporting documents of how the potential yield was determined is based on the relatively large coastal heads in the groundwater system.

2. From a hydrologic perspective, it is useful to assess the surface and groundwater resources of the study area. However, there is little or no information regarding a water balance for the study area. The analysis of precipitation, evapotranspiration, streamflow, and infiltration would provide baseline estimates of the magnitude and temporal variation in surface and groundwater (see Dunne and Leopold, 1982).

3. The criteria for well site location and well design, which are discussed in more detail in the Saito consultant report, are incomplete and do not quantify the costs and benefits associated with well field development. These design criteria, discussed on page 37, are presented without any supporting data defining the aquifer's storage and transmissive properties. These parameters, which can be determined using conventional pump tests, are crucial in assessing the feasibility of groundwater development. The results from this study are presented as "Optimal Pumping Centers", without addressing how the optimal decision was made. Interestingly, on page 3 of the Saito consulting report it is stated that Well Sites IA, IB were under construction in November 1991. As such, pump test data should be available for these sites and included in the EIS.

4. The development of a well field depends on the costs of groundwater development, the benefits associated with providing the water supply, and an assessment of the potential environmental impacts. These impacts can range from well interference effects (increases in drawdowns) and the decline of the hydraulic or piezometeric head that could alter the hydraulic interaction between surface and groundwater. Preliminary determination of the drawdown pattern can be determined using simple models of the groundwater system (see Willis and Yeh, 1987). For example, with the well pattern and yields stated in the consulting report, the Theis solution, could be used to assess the probable variation in drawdown throughout the study area with the proposed well pattern and yields presented in the consulting report. This baseline information can then be used to analyze the impact of the development on surface waters.

5. Groundwater development in coastal areas can increase the likelihood of saltwater intrusion. The Draft EIS does not address the potential water quality problems associated with the development of the groundwater. Using the baseline map presented in the Draft EIS, it is possible to estimate the probable rise in the interface associated with groundwater pumping. This information could be used to assess the probability of upconing and contamination of the water supply wells.

In summary, the Draft EIS presents a groundwater development plan with very little supporting information to validate its hydrologic potential. There is (1) no quantitative discussion about the probable impacts of the development plan on groundwater or surface water, (2) no data defining the formation parameters and the potential for development, and (3) no analysis indicating that the proposed 10 MGD target is at all related to the sustainable yield of the groundwater system.

References

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Dunne, T. and L. Leopold. *Water in Environmental Planning*, W. H. Freeman, San Francisco, 1982.

Willis, R. and W. W-G. Yeh. *Groundwater Systems Planning and Management*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1987.

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OF COUNSEL:
G. RICHARD DESCH

September 21, 1992

Mr. David Craddick, Director
Department of Water Supply
County of Maui
PO Box 1109
Wailuku, HI 96793-7109

Re: East Maui Water Source Development Plan - EISPN

Dear David Craddick:

On behalf of the Coalition to Protect East Maui Water Resources, I would like to submit further comments to aid in the preparation of an adequate EIS.

1. Water quality

A considerable number of pesticides and herbicides have been used for agricultural operations on lands proposed for wells in the EM Plan. An inventory of these chemicals should be taken and tests should be implemented to assure water quality. The results of earlier tests were not stated in a small enough degree to disclose the existence of chemicals which have percolated or may percolate in the future into the groundwater resource. All tests should be undertaken at levels which allow detection of the particular chemicals being tested.

With respect to the Haiku well, DBCP has already been discovered in springs downstream of the well. With respect to the H/Poko well, it may be that oil was used to lubricate the well-drilling bits, such that this source has, to some degree, been contaminated. This should be investigated.

To be adequate, any testing for chemical contamination of the water resources should include testing for chemicals in the sediment or soils around the base of the wells.

2. Related actions

It now appears that the Department has expended substantial amounts of money to construct new water tanks in the Haiku region without any environmental analysis of the increased capacity of the water system. In the case of the Haiku well, a water tank is being built in conjunction with the uncapping of the well. The EIS must discuss all actions related to the wells, including the construction of all other improvements, such as tanks, which accompany the wells.

3. Impacts on marine resources

The EIS must discuss what impacts this project will have upon marine resources. To a significant extent, the groundwater taken by this project otherwise travels to our coastal waters. This project will prevent as much as 16 mgd from migrating to coastal areas. The loss of this amount of fresh water and the impact of this loss on marine resources must be studied.

4. Impacts on surface water resources

The EIS will be inadequate if it simply reiterates your position that there is some impermeable shield which prevents the project from having an impact on surface and perched water resources. There has been no adequate, scientific demonstration that this impermeable layer of rock exists. This speculation flies in the face of studies throughout Maui proving that fertilizers have found their way into our groundwater resources.

The EIS should identify the sphere of possible impact for each proposed well; it should identify all those individuals with registered water rights within those spheres and should establish a monitoring program for all those individuals with registered rights within those spheres.

5. Correlative water rights

The EIS should disclose the identity of the landowners upon whose land each well will be drilled. If the land is not county-owned, the EIS should disclose each and every term of all agreements reached with landowners who have allowed the county to drill wells upon their land.

In addition, for each and every well, the EIS should disclose the source of the water rights, correlative or otherwise, held by the county which allow it to take groundwater resources. The EIS should disclose the identities of others who have correlative water rights to the same resources being tapped and should include an analysis of whether the county has the correlative water rights to take the amounts of water suggested in view of the correlative water rights of other landowners.

6. Test and/or monitoring well

The State Water Resources Plan recommends that test and/or monitoring wells accompany all projects which call for many wells within a single region. The EIS should discuss whether it would be appropriate to include a test and/or monitoring well in this large scale water development project.

EXHIBIT "E"

7. Study of alternatives

Your EIS will be inadequate if it does not study alternative alignments and alternative water resources. The law does not allow consultants to reject alternatives prior to preparing the EIS.

As more issues arise, the Coalition will submit these to you to aid in the preparation of an adequate EIS. If you have any questions about any of the above, please do not hesitate to contact me.

Sincerely yours,

Isaac Hall

IH/jp
cc: Coalition to Protect East Maui Water Resources

B. Recommendations

1. A periodic review of sustainable yields and all pertinent hydrologic data and water quality parameters should be done at least every five years or even more frequently if circumstances warrant.

2. A Statewide resource monitoring and data collection program should be implemented with equal emphasis on surface and groundwater.

3. Each aquifer system in which substantial groundwater development is underway should have a deep monitoring test well which penetrates through the fresh water lens into underlying seawater. Salinity profiles should be taken on a minimum semi-annual basis.

One profile should be taken in the last week of February, and the other in the first week of October in order to measure the behavior of the lens during the periods of highest and lowest heads.

EXHIBIT "F"

4. In those aquifer systems in which intense groundwater development is underway, simultaneous head readings should be combined twice a year, once in late February and again in early October.

5. Measurements of head at various sites should be related to a single benchmark to assure that accurate relative differences in head are obtained.

6. The current program of measuring salinity, heads and temperature should be evaluated. A formal program for obtaining these data, especially in critical areas, should be designed and carried out.

7. The current program of data gathering should be reviewed and evaluated. The number of continuous streamflow measuring sites has declined sharply in the last decade. A study should be made to determine whether the statistical data base needs reinforcement or is already adequate.

8. Physical characteristics and parameters of stream flow need to be assessed, and a stream classification scheme based on these data should be created to serve as the framework for decisions made about in-stream values and allowable minimum stream flow. The classification should address the relationships between surface water and groundwater.

9. An inventory must be made of all the stream diversion systems in the State.

10. Initiate studies in the near future on in-stream values and various parameters leading to the establishment of permanent in-stream standards. The environmental impact of these standards must also be considered.

11. Establish the relationship between surface and groundwater and determine guidelines on conjuctive use of groundwater and surface water.

12. Develop irrigation water quality criteria for primary, secondary and tertiary effluents, and brackish water.

13. Increase the confidence levels in the determination of sustainable yields. This may include more comprehensive monitoring work, refining the water balance equation, allowance for return irrigation water and interhydrologic unit transfers.

14. Proceed vigorously on research and pilot studies on:

    a. Recharge
    b. Surface water recovery
    c. Waste water recovery

    A second-line priority would be the improving of irrigation practices, and a third priority would be desalination and weather modification as means to augment our resources.

15. Study legislative means to protect and preserve our watersheds against contamination and encroachment of intake areas.

16. Conduct studies leading to a plan for orderly delineation of areas which should be zoned as conservation lands for infiltration purposes (watersheds).

17. Develop strong and effective short-and long-term water conservation programs.

18. Expand studies on the feasibility of bulkheading dikes to create greater storage capacities.

19. Amend building and plumbing codes to require the installation of water-conserving devices and appliances including landscape irrigation control fixtures.

20. Investigate the possibilities of using waste heat resulting from the use of nuclear energy in power generation and geothermal energy in the desalination process.

21. Initiate and expand studies on the conjunctive use of surface and groundwater.

22. Investigate technology and means of reducing evapotranspiration.

23. Conduct research on the feasibility of inducing rainfall through weather modification.

24. Study feasibility of combining water and wastewater functions under single management for maximum utilization of our water resources.

25. Conduct more research and pilot studies on the desalination of brackish water by both the reverse osmosis and electrodialysis methods, with emphasis on cost reduction, particularly energy costs.

26. Expand flood control and drainage programs to increase use of our water resources for irrigation, recreational, fish propagation, and recharge purposes.

27. Plan for and initiate a comprehensive program of monitoring for water quality of both ground and surface water sources to identify types and concentrations of contaminants to comply with levels (MCL) specified by the State Department of Health. Monitoring should be conducted in such a manner so as to establish relationships between the sources of contamination and points of water withdrawal.

28. Initiate development of a Statewide Water Conservation Plan with the State Water Resources Management Commission assuming a leadership role. Under present law, participation by the counties, Federal government and private business would be on a voluntary basis. Eventually, the Legislature may have to consider granting powers of enforcement to the State if a voluntary program should prove ineffective or if long-range considerations justify.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

May 21, 1993

Mr. Isaac Davis Hall
Attorney at Law
2087 Wells Street
Wailuku, Hawaii 96793

Dear Mr. Hall:

We are in receipt of your comments dated December 7, 1992 on the Draft Environmental Impact Statement (DEIS) prepared for the East Maui Water Development Plan. Our retained civil engineering consultant, Norman Saito Engineering Consultants, Inc., and the sub-consultant who prepared the DEIS, Parametrix, Inc., have reviewed the comments and prepared the following responses:

INTRODUCTION:

The registration of existing water uses is on file with the State Commission of Water Resource Management (CWRM). The CWRM list of registered water users are public files. It is not necessary to provide an inventory of registered East Maui residents which may be affected by the EMPLAN in the FEIS. The EMPLAN is a basal water development plan, and no surface water resources will be affected. The CWRM through their permit process will consider if water users will be significantly impacted before issuance of the well and pump permits.

I. GENERAL COMMENTS/SUMMARY:

We disagree with your conclusion that the DEIS is "totally inadequate and must be redrafted". The DEIS was prepared in full compliance with Chapter 343 and the Environmental Impact Statement Rules, §11-200-1 et seq. We will respond to your specific alleged deficiencies in this letter.

II. NO DESCRIPTION OF THE ENVIRONMENTAL SETTING:

Existing conditions have been presented in Chapter IV of the DEIS. For example climate; surrounding/ adjacent land uses; existing improvements; topography; soils; hydrology; flora; fauna; noise; air quality; scenic and aesthetic resources; historic and archeological sites; land use; economy; employment; which are part of the environmental setting have been discussed.

A. Perennial Streams. You contend that perennial streams may be adversely affected and an inventory of the possible affected streams be conducted and stream flow studies performed.

The EMPLAN will develop the basal ground water lens and therefore, no surface water resources will be affected, including perennial streams. The following is a hydrogeologic description of the streams in the area prepared with the assistance of Water Resource Associates:

Perennial streams in the east part of the Haiku-Honopou area are more related to the occurrence of abundant mauka rainfall and a thick (100 to 150 feet) formation of weathered andesites and andesitic basalts (Kula volcanic series) having low to moderate permeabilities. These two hydrogeologic conditions give rise to the occurrence of significant amounts of perched ground water in the Kula formation. The streams which have eroded into the Kula formation serve as natural drains of the perched ground water which result in perennial flows.

Below the Kula formation, older, permeable basalts of the Honomanu volcanic series occur. Unlike the Kuhiwa Well situation, the Kula and underlying Honomanu formations (between the coast and at least three to four miles inland) are not fully saturated. This conclusion is first based upon observations of unsaturated rock conditions above a near-sea level basal groundwater table in several wells in the Haiku area: Hamakuapoko 1 (5420-02), Hamakuapoko 2 (5320-01), Upper Haiku (5419-01), Haiku School (5519-01), and Baldwin Manor (5519-03). Secondly, no perennial flows or seepages are

known to occur in Maliko Gulch. Maliko Gulch, which has eroded some 200 feet deep into the Kula lavas, is the deepest gulch within the Project area.

In summary, the proposed water development plan will have no long-term impact on any streamflows in the Haiku area because the plan consists entirely of basal water development having no effect on any perched groundwater (which feed some of the streams in the area) or any high level, dike-confined groundwater (which is not known to occur in the Haiku area).

Any impact due to encountering possible high-level, perched ground water during well drilling will be short-term and temporary. Rigorous procedures will be followed for monitoring water levels and constructing each well. If any high-level, perched ground water is encountered during drilling, it will be sealed off with cement grout before further drilling is allowed to continue, as was done during the drilling of Hamakuapoko Well 1 (5420-02). Further, during final construction, the well will be cased with solid steel casing from the ground surface to sea-level elevation and the annular space between the casing and drill hole will be grouted with cement, securely sealing off any high-level, perched groundwater source which might possibly contribute to streamflow.

Therefore, no stream inventory or stream flow studies were conducted.

B. Early Native Hawaiian Uses and Plantation Stream Diversions:

1. Again, it is reiterated that this project consists of basal ground water development and thus will have no impact upon stream flows in the Haiku area. Since no surface water resources will be affected by the EMPLAN, no surface water rights, i.e. riparian or appurtenant, nor surface water diversions will be affected by the EMPLAN.

C. Groundwater Development:

1. We have been informed that there are no requests for well drilling or pump installation permits by others in the Haiku area on file with the CWRM; hence, we cannot identify any other person who plans to utilize the same water resources.

2. EMPLAN will not develop and withdraw 100% of the sustainable yield of the Paia or Haiku Aquifers. A reserve will remain for future use.

   There is a misunderstanding on your part regarding the term "sustainable yield". Simply, sustainable yield is a long term maximum rate at which water may safely be withdrawn from an aquifer and is equated with the average day demand. EMPLAN proposes to withdraw 9.3 mgd from two aquifers, the Paia Aquifer and the Haiku Aquifer.

   The CWRM has established a sustainable yields is 8 mgd in the Paia Aquifer and 15 mgd in the Haiku Aquifers ("Water Resources Protection Plan, 1990").

   EMPLAN proposes that the average day withdrawal from the Paia Aquifer will be 1.3 mgd and 8 mgd from the Haiku Aquifer (based upon a 16-hour average pump day). This leaves 6.7 mgd of sustainable yield in the Paia Aquifer and 7.0 mgd of sustainable yield in the Haiku Aquifer available to others. The CWRM, in all events, will make the final decision on all withdrawals from the aquifer.

3. The management of water resources, both surface and groundwater, and the allocation of water uses and water rights are the responsibility of the CWRM. The EMPLAN is a basal ground water development plan with no surface water involvement. Consequently, surface water rights including riparian, appurtenant, or any other, are not involved in the EMPLAN. The EMPLAN recognizes that there are some existing basal groundwater users, and allowance have been made for these users as explained above.

4. After the Project has been completely developed and constructed, the Paia and Haiku Aquifers will have reserve sustainable yields available to others. DWS is aware of the correlative rights of other landowners and has accommodated their needs as much as possible. However, the final decision to allocate correlative rights and uses rests with CWRM.

D. Neither the Water Code nor any other state law prohibit the transfer of ground water from one area to another. Case law such as the Robinson cases apply to the transfer of surface water not groundwater from one watershed to another.

E. Registered Water Rights:

1. As stated above, EMPLAN will leave a reserve of sustainable yield in each aquifer. The final determination of the amount of water that can be developed in the Paia/Haiku Aquifers will be made by CWRM.

F. Existing and Future Proposed Uses of Water Resources Within the Locality:

1. The projected maximum day consumption of the combined Haiku/Pauwela, Kuiaha, and Kokomo/Kaupakalua service areas to be served by EMPLAN once the plan is fully implemented is 0.48 mgd. Generally, the area to be serviced by EMPLAN is the area below Haiku Road. Since EMPLAN does not reach Kaupakalua Road, the far eastern portion of the Kokomo/Kaupakalua service area is also excluded. The total projected maximum day consumption for these areas is 1.14 mgd.

As stated above, EMPLAN will not use 100% of the sustainable yields of each aquifers. Additional agricultural/residential uses in the Paia/Haiku areas in excess of the Community Plan projections can be served by the remaining water in each aquifer. CWRM will allocate the water uses.

G. In-stream Values:

1. The EMPLAN is a basal ground water development plan. No surface water resources including stream flows will be affected.

H. Groundwater Underflows:

The FEIS will be revised to include the following:

The Haiku basal groundwater lens is thin near the coast, based upon a few reported heads in wells drilled near the coast. Based on an average head of 3 to 5 feet, the basal groundwater lens extends approximately 120 to 200 feet below sea level and discharges as underflow into the ocean in this interval of depth below sea level.

Underflow from the Haiku aquifer amounts to some 30 mgd (calculated as two times the sustainable yield of 15 mgd) and from the Paia aquifer, 17 mgd (Water Resources Protection Plan, June 1990). Such underflow becomes diffused or diluted with sea water as it moves through the permeable Honomanu lavas capped by less permeable Kula lavas which extend to the coast and beyond offshore.

The ultimate development of approximately 8.0 mgd from the Haiku basal aquifer and 1.3 mgd from the Paia basal aquifer, compared to an estimated diffused underflow of 30 mgd and 17 mgd, respectively, is not expected to have any significant impact on existing marine resources or conditions. Adverse impacts on marine resources resulting from similar basal groundwater developments elsewhere in the State have not, to the best of our knowledge, been reported.

III. HYDROLOGIC CHARACTERISTICS OF THE PROJECT:

A. Estimate of Sustainable Yield:

1. The CWRM has established a sustainable yield of 15 mgd in the Haiku Aquifer and 8 mgd in the Paia Aquifer. Since the required water budget analysis

of these aquifers has been performed to establish the sustainable yield values, another analysis to duplicate these studies for the DEIS and the EMPLAN is not necessary.

Further, pumping data will continually be evaluated to confirm or adjust the sustainable yield values. CWRM is responsible for the determination of sustainable yields.

B. The Interrelationship Between Ground and Surface Waters:

1. Please refer to the hydrogeologic description of the relationship of the Haiku Aquifer and the streams in the area prepared by Water Resource Associates set forth in Section IIA above.

2. The Water Resource Associates report will be included in the FEIS.

C. The Coalition's Hydrologic Consultants:

1. Hydrologic and geological considerations were analyzed in the "Water Resource Protection Plan" for the CWRM and confirmed in the BWS "Maui County Water Use and Development Plan, 1990". The DWS and their consultants do not dispute the sustainable yields developed by the CWRM.

Further as stated in Section 4.7.2a of the DEIS, the Central Maui Water Study, Part II, prepared by Norman Saito Engineering Consultants, Inc. (February, 1991) analyzed and reported the hydrogeology of the Paia and Haiku Aquifers. The Central Maui Water Study, Part II, was also reviewed by the Coalition's Hydrologic Consultants. We believe that the draft EIS provides insufficient detail on the hydrology and geology of the study area.

2. The Coalition's Consultant's letter states "It does appear that if the wells are properly constructed, surface water flows should not be impacted at the 700 foot elevation that the proposed wells are to be constructed". EMPLAN proposes to develop basal ground water and not surface water.

The FEIS will be revised to include the following:

"Streamflow at Lower Elevations

Most streams in the Haiku area (where the EMPLAN proposes to develop basal groundwater occurrence at sea level) have elevated profiles and generally discharge into the ocean over a steep coastal sea cliff some 80 feet above sea level. Approximately a half mile inland of the sea cliff, most stream profiles are at an elevation of 200 feet above sea level (see Interpretive Hydrogeologic Section). The intervening lava flows (Kula volcanic series) below the streams and the underlying basal groundwater table are unsaturated, otherwise, ground water would be perennially flowing out of the face of the coastal sea cliff. Some high-level ground water does occur in the near coastal area, as evidenced by sporadic seepages in the sea cliff during sustained rainy periods. Although such high-level, perched ground water may contribute to streamflows at lower elevations, neither perched ground water nor stream sources will be affected by the EMPLAN's development of the Haiku basal groundwater lens which has a head (static water level above mean sea level) of approximately 3 to 5 feet above sea level in the near coastal area."

3. The EMPLAN is a reasonable basal ground water development plan and beneficial to the DWS.

a. The EMPLAN is being phased and wells are scheduled to be drilled on an "as needed" basis over an anticipated 15 year period. The project phasing will allow for adjustments in the sustainable yield and minimize the possibility of "over developing" the aquifer.

b. The ground water characteristics will be better understood as more pumping information and activity is conducted. There will be more reliable information to determine the sustainable yield for the Haiku Aquifer. The DWS will submit data to the CWRM which will determine whether to revise the current sustainable yield estimates.

c. The County of Maui Water Conservation Program alternative discussed in Section 7.2 of the DEIS will be revised to read as follows in the FEIS:

> In addition the County of Maui had amended the Uniform Plumbing Code to require that effective December 31, 1992 only low-flow water fixtures and devices that meet the performance requirements established by the American National Standards Institute shall be offered for sale or installed in the County of Maui. Performance standards for kitchen, lavatory and public restroom faucets, hose bibbs, showerheads, urinals and toilets are specified. The Department of Water Supply anticipates that the installation of these low-flow water fixtures and devices will conserve water. Additional measures are under consideration. However, the Water Conservation Program is new and will take time before a significant amount of water is conserved. Thus, DWS must proceed with EMPLAN. Otherwise there may be a gap when no additional water is available from the Iao Aquifer and the first increment of EMPLAN is put into operation. Also EMPLAN is flexible. If the Water Conservation Program is very successful, then the pace of development under EMPLAN can slow down or even stop, e.g., if land use policies change or if the Water Conservation Program is very successful, or both.

4. The Coalition's consultant, Hydro Resources International (HRI), suggests that more effort should be placed in project planning. The first step being to obtain data that "characterize the hydrologic, hydraulic and recharge properties of the aquifer." We believe that the Water Resource Protection Plan and the Maui County Water Use and Development Plan, 1990 in fact includes this analysis. EMPLAN will develop additional data to assist in continued planning and development of the aquifers.

   The Consultants also state that the relationship can be developed to assess "the hydraulic response of the aquifer to pumping". This means that wells must be drilled, equipped pumped and tested. This is exactly what the Project will do. Hence, the Coalition's Consultants agree with the EMPLAN.

5. We disagree with the conclusions made by Hydro Sources International, Inc. that "the Draft EIS presents a groundwater development plan with very little supporting information to validate its hydrologic potential." As explained in this letter and the DEIS the sustainable yield values were established by CWRM. Hence the analysis regarding the sustainable yields were not presented in the DEIS.

6. We disagree with your statement that a monitor well is required for the Project.

IV. INADEQUATE PROJECT DESCRIPTION:

A. <u>The Central Maui Water Project</u>:

We submit that Chapters I and II of the DEIS adequately describe the Project in detail.

1. DWS does not determine the land use policies for the County. The County Council in adopting the General Plan and Nine Community Plans for various areas of the County established the land use policies. Section 8-11.2.3 of the Charter of the County of Maui, mandates the Department of Water Supply to "implement the County's general plan and community plans in the administration of its affairs". EMPLAN implements the water portion of the Community Plans for Wailuku-Kahului, Kihei-Makena, and portion of Paia-Haiku.

2. The General Plan and the Community Plans determine the growth of the County. EMPLAN by itself will not induce growth. EMPLAN supports the policies set forth in the General Plan and the Community Plans for Wailuku-Kahului, Kihei-Makena and portions of Paia-Haiku.

3. The EMPLAN seeks to meet the growing water demands of all water users, existing and future, within the Central Maui Water System. The need to develop additional sources, storage facilities and transmission lines is non-discriminatory. EMPLAN will implement the General Plan and related Community Plans and provide an adequate water supply to all consumers in the Central Maui Water System including the members of the Central Maui Source Joint Venture.

4. The EMPLAN will implement the General Plan and related Community Plans within the Central Maui Water System. The Kahikinui and Kula areas are not part of the Central Maui Water System. Development of water sources for these areas will be done as separate projects apart from EMPLAN.

B. <u>Development of the EMPLAN</u>:

1. EMPLAN has a planning period of 20 years which is the same period that the Maui Planning Department has selected for its infrastructure development program. EMPLAN thus is planning ahead in coordination with the other agencies and departments of the County of Maui.

2. EMPLAN does provide the flexibility to continue water development easterly where higher rainfall indicates high probability of substantial ground water resources. However, this is a future consideration.

V. ANALYSIS OF THE IMPACTS OF THE PROJECT IS INADEQUATE:

A. Your statements are argumentative and conclusory. We have responded previously to your alleged deficiencies.

VI. THE DISCUSSION OF ALTERNATIVES IS INADEQUATE:

A. The alternatives considered in the DEIS other than the Water Conservation Alternatives, were alternatives considered by the DWS as feasible and studied in the draft "Maui County Water Use and Development Plan, 1992". The DEIS only highlights the major impacts of these alternatives.

VII. INADEQUATE DESCRIPTION OF APPLICABLE LAND USE CONTROLS:

A. The FEIS will be amended in Chapter V to include the following:

> The socio-economic setting for the Maui County General Plan and the present Community Plans has already been prepared for the Maui County Planning Department in the "Economic, Demographic, and Selected Land Use Forecasts, Proposed Community Development Plans, County of Maui, State of Hawaii", Hastings, Martin, Chew and Associates, Ltd., 1981. "Maui County Community Plan Update Program Socio-Economic Forecast Report", 1992, prepared by Community Resources, Inc.; and "Land Use Forecast Technical Study" and a "Water System, Maui Infrastructure Assessment" prepared by Wilson Okamoto & Associates, Inc. for the Maui County Planning Department. Figure 2 in the DEIS was taken from the "Water System, Maui Infrastructure Assessment".

The need to analyze the socio-economic impact due to the EMPLAN is not necessary since the intent of the EMPLAN is to conform to the same Maui County General Plan and related Community Plans.

B. The EMPLAN will be consistent with the State Water Code and the "Haui County Water Use and Development Plan", which is part of the CWRM's Hawaii Water Plan.

C. The 28 recommendations contained in the draft of the "Water Resources Protection Plan" dated March, 1992 have not been adopted by the CWRM even as recommendation. If and when all or a portion of the recommendations are adopted by CWRM and EMPLAN must comply, then adjustments will be made. However, recommendations applicable water conservation programs have been implemented as mentioned in the DEIS and this letter.

VIII. THE DEIS FAILS TO CONSIDER MITIGATION MEASURES TO MINIMIZE PROJECT IMPACTS:

A. As stated previously, the EMPLAN will have no impact upon streamflows in the Haiku area because it consists entirely of basal ground water development having no effect on any perched ground water. Any high level, dike-confined ground water is not known to occur in the Haiku area.

However, if even though remote, a "saturated" rock condition is discovered, then the Department of Water Supply will monitor the nearby stream flows during pumping tests to see if stream flows are affected. Alternative courses of action will be reviewed, including closure of the well if required. Stream flow impact will be disclosed and made available to the public.

B. <u>Groundwater Monitoring</u>:

Hydrogeologic conditions will be constantly monitored during the drilling and test pumping phase. Other wells in the area will be checked for salinity and water levels during the test pumping phase. Wells will be equipped with water level monitoring tubes so that water levels can be measured even with a pump in the well.

Thank you for your comments.

Sincerely,

David R. Craddick, Director
Department of Water Supply

/hk

cc Norman Saito Engineering Consultants, Inc.

ASC92-9

ARCHAEOLOGICAL INVENTORY SURVEY OF THE EAST MAUI WATERLINE PROJECT WAILUKU AND MAKAWAO, MAUI ISLAND

(TMK 2-5-03 thru 05; 2-7-03, 2-7-07 thru 11, 2-7-13, 2-7-16 thru 20; 3-8-01, 3-8-06 thru 07, 3-8-51, 3-8-59, 3-8-61, 3-8-70, 3-8-71)

by

Aki Sinoto

and

Jeffrey Pantaleo, M.A.

for

Norman Saito Engineering Consultants, Inc.
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September 1992

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EXHIBIT A

INTRODUCTION

At the request of Norman Saito Engineering Consultants, Inc., of Wailuku, Maui; Aki Sinoto Consulting conducted an archaeological inventory survey for the proposed East Maui Waterline Project in Northeast Maui. The main 36" pipeline, measuring over 20 miles long, extends from East Maui sources to the existing 36" Central Maui Transmission Pipeline near Kuihelani Highway. Connections to the Central Maui Water System between Hamakuapoku and the Central Maui Transmission Pipeline are proposed at Paia, Haleakala Highway, and Puunene. The pipeline also will extend east from Hamakuapoku, across Maliko Gulch, and into the Haiku area. Several 12" and 8" pipelines branch from the main 36" pipeline where it will connect to new wells. The survey was conducted during several intervals, as engineering plans were refined. An initial field assessment of Maliko Gulch and associated well locations took place in October of 1991. The current inventory survey was conducted during intermittent periods between June 17 and September 3, 1992. The survey was undertaken by the two authors of this report.

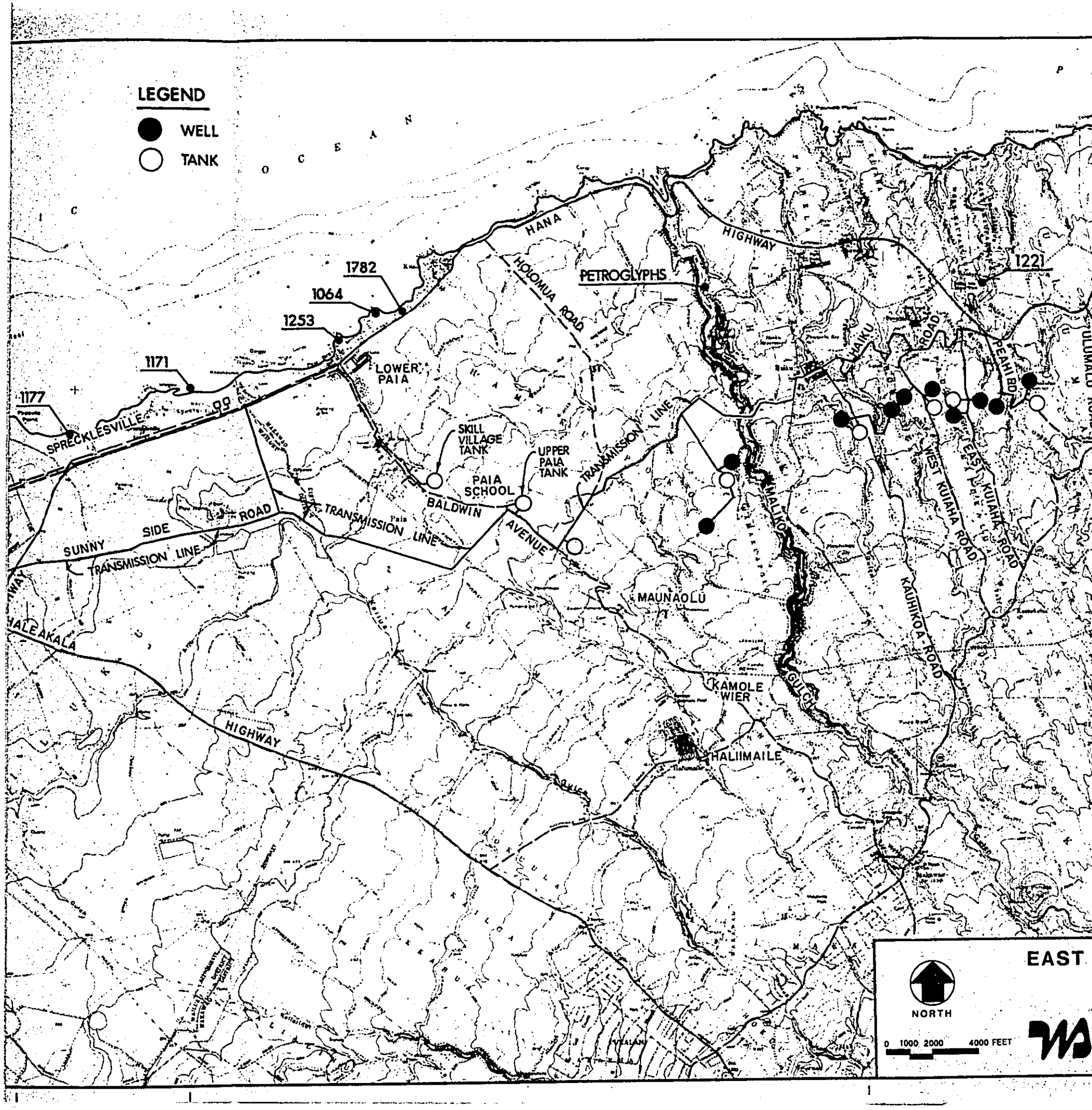
PROJECT AREA

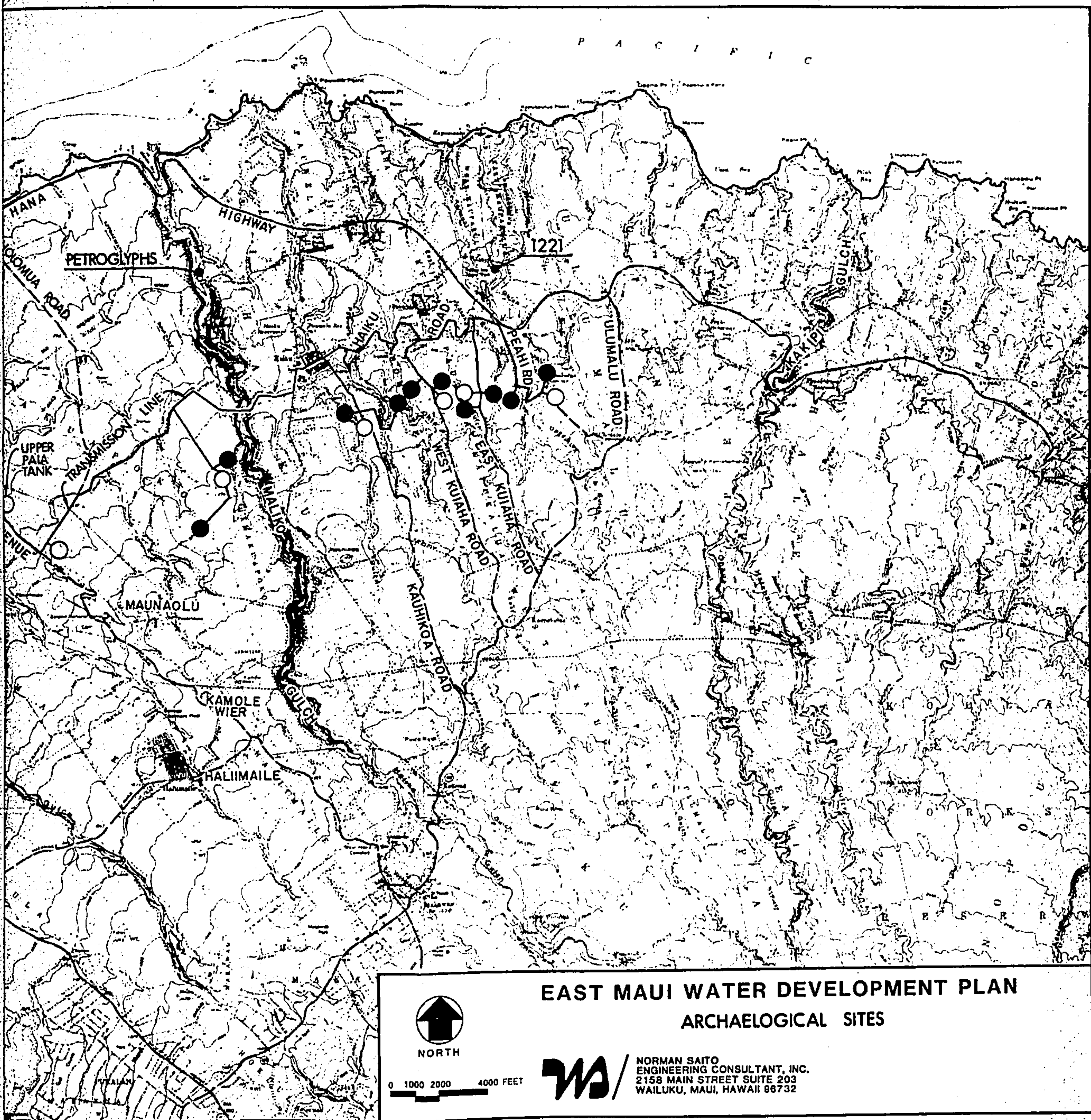
The project area is located along coastal and inland portions of northeastern Maui and traverses various parcels in TMK 2-5-03 thru 05; 2-7-03, 2-7-07 thru 11, 2-7-13, 2-7-16 thru 20; 3-8-01, 3-8-06 thru 07, 3-8-51, 3-8-59, 3-8-61, 3-8-70 and 71. The majority of the pipeline extends over existing paved and cane roads and across several gulches (Fig. 1). Appendix A provides the pertinent Tax Maps.

The new waterline will be completed in six construction phases as follows:
Phase 1 will involve installing a new 36" waterline from the Upper Paia 12" waterline to the Hana Highway via the former Kaheka Village and Old Makawao Road. From the intersection of Sunnyside Road and Old Makawao Road, the main 36" pipeline will extend westerly across Kailua Gulch. A 16" pipeline parallel to and west of Kailua Gulch will connect the main 36" pipeline on Sunnyside Road with the existing 12" pipeline on Hana Highway.

Phase 2 will involve extending the main 36" pipeline along Hana Highway from Sunnyside Road to Haleakala Highway. A 16" pipeline will extend along Haleakala Highway from Hana Highway and connect to existing pipelines at Kahului Airport. The

PACIFIC OCEAN
WAIEHU WELLS
KAHULUI BAY
Kahului Harbor
KAHULUI AIRPORT
1177
WAILUKU
KAHULUI
HANA HIGHWAY
HALEAKALA HIGHWAY
SPANISH ROAD
HANSEN ROAD
HANA HIGHWAY
TRANSMISSION LINE
PUUNENE AVE.
H.C.&S.CO. MILL
KUIHELANI HIGHWAY
TRANSMISSION LINE
MOKULELE HIGHWAY
Existing 36-inch
Wailuku/Kihei
Waterline
Spartan Reef
Puunene


LEGEND
WELL
TANK
1782
1064
1253
1171
1177
1221
HANA HIGHWAY
HOLOMUA ROAD
PETROGLYPHS
LOWER PAIA
SPRECKLESVILLE
SKILL VILLAGE TANK
UPPER PAIA TANK
PAIA SCHOOL
BALDWIN AVENUE
TRANSMISSION LINE
SUNNY SIDE ROAD
HAIKU ROAD
PEAHI RD
WEST KUIAHA ROAD
EAST KUIAHA ROAD
MALIKO
MAUNAOLU
KAUHIKOA ROAD
KAMOLE WIER
GULCH
HALIIMAILE
HIGHWAY
NORTH
0 1000 2000 4000 FEET
EAST


PACIFIC
HANA
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1221
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ULUMALU ROAD
KAKIPI
GULCH
TRANSMISSION LINE
UPPER PAIA TANK
WEST KUIAHA ROAD
EAST KUIAHA ROAD
MALIKO
GULCH
KAUHIKOA ROAD
MAUNAOLU
KAMOLE WIER
HALIIMAILE
NORTH
0 1000 2000 4000 FEET
EAST MAUI WATER DEVELOPMENT PLAN
ARCHAELOGICAL SITES
NORMAN SAITO
ENGINEERING CONSULTANT, INC.
2158 MAIN STREET SUITE 203
WAILUKU, MAUI, HAWAII 96732

Figure 1. Location of Project Area and Previously Recorded Sites

main 36" pipeline will continue along Baldwin Avenue from the Upper Paia water tank, and extend along Sunnyside Road from Kailua Gulch to Hana Highway. A 12" pipeline will extend along Kauhikoa Road from Haiku, and a 8" pipeline will connect Wells 2A and 2B.

Phase 3 will involve connecting the main 36" pipeline in Haiku Road to new wells on the East Maui Transmission Line. The 36" pipeline will extend along Hansen Road from Spanish Road to Haleakala Highway. The 36" pipeline will also extend along Spanish Road from Kahului Industrial Park to Hansen Road. A 24" pipeline will branch from the main 36" pipeline along Spanish Road from Kahului Industrial Park to Dairy Road. A 8" pipeline will connect to Wells 3A and 3B, and a 12" pipeline will connect to Well 3B to Haiku Road on West Kuiaha Road.

Phase 4 will involve continuing the main 36" pipeline west along Haiku Road from Konanui Gulch. A 12" pipeline will extend south on East Kuiaha Road from Haiku Road. A 8" pipeline will branch from the main 36" pipeline on East Kuiaha Road to Wells 4A and 4B.

Phase 5 will involve connecting the main 36" pipeline from Puunene to the Central Maui Transmission Main.

Phase 6 will involve continuing the main 36" pipeline from Konanui Gulch to Hana Highway. A 12" pipeline will branch from Hana Highway to Well 5A, and a 8" pipeline will connect wells 5A to 5B.

ENVIRONMENT

Major segments of the pipeline is located on paved and cane roads, existing sugar cane fields, and gulches. Annual rainfall averages 0-5 inches in the drier, coastal areas near Paia, and 5-10" in the higher elevations near Makawao, with most of the precipitation occurring in the winter months between November and February.

Vegetation in the project area varies, depending on specific locations along the 20 mile corridor. The majority of vegetation along the corridor is sugar cane (Saccharum officiarum). The gulches are dominated by christmasberry (Schinus terebinthifolius), mango (Mangifera indica), koa hoale (Leucaena glauca), guava (Psidium guajava), laua'e (Microsorium scolopendria), Natal redtop grass

(Tricholaena rosea), false staghorn fern (Dicranopteris linearis), and other various ferns and grasses.

The following soils are represented in the project area:
(name/slope/runoff/erosional hazard/occurrence)

Ewa Silty Clay Loam / 0–3% / very slow / slight / in basins and alluvial fans.

Haiku Clay / 3–7% / slow / slight / well drained upland soil.

Haiku Clay / 7–15% / slow to moderate / slight / uplands.

Iao Silty Clay / 0–3% / slight / slight / well drained, alluvial fans.

Iao Silty Clay Loam / 7–15% / medium / slight to moderate / smooth alluvial fans.

Iao Cobbly Silty Clay Loam / 3–7% / medium / slight to moderate / cobbles.

Jaucas Sand / <7% / slight / severe wind erosion hazard / near coast.

Molokai Silty Clay Loam / 0–7% / slow to medium / moderate / well-drained uplands.

Molokai Silty Clay Loam / 7–15% / slow to medium / moderate / knolls.

Paia Silty Clay / 3–7% / slow / slight / uplands and gentle slopes.

Paia Silty Clay / 7–15% / slow / slight to moderate / uplands.

Pulehu Silt Loam / 0–3% / slow / slight / alluvial fans and basins.

Pulehu Silty Clay Loam / 0–3% / slow / slight / stream terraces.

Puuone Sand / 7–30% / slow / moderate to severe wind erosion / low uplands.

Waiakoa Cobbly Silty Clay Loam / 3–7% / slow / slight / smooth low uplands.

Rockland – rocks cover 25–90% of surface – occurs in gulches.

Rough Broken Land – steep intermittent drainage – occurs in gulches.

Other than those soils that occur in gulches and sand dune areas, these soils are coomonly used for pineapple, sugarcane, pasturage, and homesites.

LAND USE HISTORY

Other than the coastal areas included in the Phase 2 development corridor and the Kahului sand dune areas in the Phase 5 development corridor, prehistoric exploitation of much of the intermediate zones included in the Phase 1, 3, and 4 corridors was minimal according to available archaeological data.

The majority of the project area has been cultivated in sugar cane for over one-and-a-half centuries by a number of plantations including Claus Spreckels' Hawaii Commercial and Sugar, H.P. Baldwin Company, Maui Agricultural Company, and Haiku Plantation. Thus much of the historical uses of the area were associated with the development of intensive agriculture. These included irrigation and transportation systems as well as camps for the growing population of immigrant workers. The agricultural lands are currently consolidated under Alexander and Baldwin, the major landowner in the project area, and sugar cane continues to be cultivated by the Hawaii Commercial and Sugar Company.

The project corridor passes through or runs adjacent to seven Land Commission Awards as listed on Table 1.

Table 1. Land Commission Awards

L.C.A. No.	Awardee	Acreage	Use
3336	Nalopi	5.15	-
3829	Paele	3.97	-
4133:4	Kaai	1.82	-
4579	Ii	1.88	-
6510pp:1	Niu	0.40	-
6510xx:1	Kauhi	0.77	taro
11216:27	Kekuaonohi	2919.75	-

The documentation for only one of the awards, 6510xx:1 to Kauhi, included reference to any usage of the land. Taro in this case, although unspecified in the records, was probably dryland cultivated.

The project corridor traverses or runs adjacent to twenty-six Grants as listed on Table 2.

Table 2. Grants

Grant No.	Grantee	Acreage	Date
121	Richard Armstrong	6c110f11ft	5-26-1849
138	Kapiha	39.79	9-27-1849
139	Kaia	16.79	9-27-1849
165	M Kekuanaoa	567.00	11-20-1849
220	William L Lee	612.00	2-19-1850
3152	Henry Cornwell	Waikapu ahupua'a	11- ?-1875
3343	Claus Spreckels	24000.00	9-30-1882
4579	Jacinath d'Erstalla	90.13	3-29-1902
6425	E G Bartlett	29.73	8-04-1915
6470	Carl F M Sommerfield	49.58	1-01-1915
6484	Elizabeth A. Turner	30.42	11-04-1915
6500	Lester L Souers	32.00	12-17-1915
6553	Florence Wood	30.15	5-10-1916
6691	William J. Cooper	48.30	9-11-1916
6872	T W Ferguson	49.25	7-13-1917
7078	Earnest O. Born	50.23	8-05-1918
7179	Ida L Harris Collins	43.64	2-08-1919
7280	Elizabeth J Lindsay	35.76	5-31-1919
7359	W I Wells	45.50	10-31-1919
7434	H M Wells	38.10	3-04-1920
7525	Elizabeth C A Lindsay	35.10	7-08-1920
7669	Antone Borge	40.30	11-16-1920
7683	Phillip McKaig	34.98	11-30-1920
8046	William Henning	56.86	4-12-1922
8078	Masachi Tanaka	14.75	6-24-1922
8443	James Lindsay	37.75	4-25-1924

Claus Spreckels the grantee of Grant 3343 was the founder of Hawaii Commercial and Sugar Company and often referred to as Hawaii's "Sugar King."

PREVIOUS ARCHAEOLOGY

No archaeological investigations have been conducted within the pipeline corridor, but numerous projects have been undertaken in the vicinity.

Bordner (1982) conducted an archaeological reconnaissance for the Paia sewage system part A (Job #82-45). Results of the survey and monitoring were negative.

Mitchell (1983) investigated reports of burials exposed along a cliff-face at Paia. Results of the investigation determined that erosion along the cliff exposed human remains.

Speakman (1986) reported to Bishop Museum a petroglyph site located in Maliko Gulch (TMK 2-5-04:37). The petroglyphs are located near the stream below the area where the old railroad crossed the gulch.

Clark and Toenjes (1987) conducted archaeological monitoring of the sewer line construction from Sprecklesville to Ku'au, Maui. Results of the archaeological investigation indicated the presence of prehistoric occupation, fishing, and burials along the coast. Six archaeological sites (State Sites 50-50-05-1777-1782) were recorded during the monitoring. State Site 50-50-05-1777, an exposed cultural deposit, included charcoal, volcanic glass, marine shell, sea urchin, bird and mammal bone, and basalt and coral artifacts. Radiocarbon dates recovered from the deposit ranged from A.D. 1420-1810. State Site 50-50-05-1778, an exposed cultural deposit, included three pit features, charcoal stained soil, a charcoal concentration, an ash lens, and a burial. Radiocarbon dates recovered from the deposit ranged from A.D. 1660-1945. State Site 50-50-05-1779, an exposed cultural deposit, included a pit feature and two charcoal lens. State Site 50-50-05-1780, an exposed cultural deposit, included three hearths, three charcoal concentrations, and four pit features. State Site 50-50-05-1781, an exposed cultural deposit, included a hearth, a charcoal concentration, and two pit features. State Site 50-50-05-1782, an exposed cultural deposit, included marine shell.

Fredericksen (1988) conducted an archaeological inventory survey on a 34 acre parcel of land in Sprecklesville, Maui. Results of the survey were negative.

Griffin (1988) conducted an archaeological surface survey of the proposed Kula water system improvements project. The survey was conducted between the Olinda Water Treatment Plant and the Waikomai Reservoir at the 4200 ft elevation. Results of the survey were negative.

Fredericksen (1990) conducted an archaeological inventory survey of an 18 acre parcel in Kuiaha-Pauwela Homesteads, Haiku, Maui. The project area is located on a plateau bounded by a gulch and Kauhikoa road. Results of the survey were negative.

Borthwick (1990) conducted an archaeological reconnaissance of a 12.4 acre parcel in Paia, Maui. Results of the survey identified several burials (State Site 50-50-05-1064).

Donham (1991) conducted a field inspection of a rock feature at Pu'u o uma (Haiku Hill), Hamakuapuko, Maui. Results of the investigation determined that the rock feature is natural.

SITE EXPECTABILITY

Recent synthesis of available data have suggested earliest settlements on Maui Island occurred between A.D. 300-600 in the windward and coastal areas, with population expansion into dry leeward areas by A.D. 1000. Initial occupation in windward and coastal areas occurred due to favorable agricultural and marine resources (Kirch 1979).

Since the project area ranges from coastal to inland regions of Northeast Maui, site expectability will vary according to location. Although the majority of the project corridor along coastal areas is covered by existing roads, potential subsurface remains may be identified during excavation for the waterline. These subsurface features may include buried cultural deposits that contain charcoal, marine shell, volcanic glass, basalt artifacts, and pit features, and burials.

The inland portions of the project corridor transects along existing paved and cane roads and crosses several gulches. Since the majority of the project corridor is located on existing roads and sugar cane fields, any remaining archaeological sites probably exist in the gulches or areas not disturbed by large scale cultivation. Site types expected in these gulches and surrounding areas include heiau trails, cairns, petroglyphs, walls, overhang shelters, and agricultural features on the gulch floors.

METHODS

The survey involved walking systematic transects along selected segments of the project corridor. Since the majority of the project corridor follows existing paved and cane roads, surface survey concentrated in the gulch areas. Machetes were used to cut through dense vegetation. The cane roads and exposed cut banks were inspected to locate potential exposures of subsurface deposits or features. Standard archaeological procedures were followed.

SURVEY RESULTS

No archaeological surface remains or other evidence of any significant cultural activities were encountered during the survey. Based on the extensive use of the project corridor for roads and sugar cane production and steepness of the gulch areas, subsurface testing was deemed unnecessary or unfeasible.

All of the gulches where the waterline crosses were inspected. Professional surveyors cleared a path into Maliko Gulch in order to provide access to the gulch bottom. The corridor is slated to cross this gulch roughly 600 feet above (south) of the Lowrie Ditch siphon. This portion of the gulch was observed to be narrow and steep with no usable stream side "gulch floor." Thus the probability for any cultural remains was very low. Several natural overhangs were found along the base of the gulch walls within the flood prone area and none exhibited evidence of cultural activity.

Other gulches surveyed, including Kanemoeala, Ohia, East Kuiaha, and West Kuiaha Gulches, exhibited extensive alteration by existing ranching or farming activities.

DISCUSSION

The majority of the project corridor have undergone extensive disturbances through large scale agricultural activities continuing for nearly a century. No surface archaeological sites remain in these areas. Although the absence of prehistoric remains may be attributed to the effects of compounded extensive alteration to the area, other archaeological surveys in the inland portions of Northeast Maui have resulted in a similar paucity of remains. This suggests that the intermediate area between the coast and further inland areas were generally not extensively used prehistorically for sedentary activities.

Previous archaeological research provides only minimal aid for predictability of subsurface remains. Pertinent data is unavailable for much of the project area.

Subsurface cultural remains, such as human burials, may be encountered during construction activities in the coastal and dune portions of the pipeline corridor, especially in the Phases 2 and 5 corridors where previous findings have been recorded by Clark and Toenjes (1987) and Rotunno and Cleghorn (1990).

RECOMMENDATIONS

Much of the final locations and alignments, such as additional well sites and location of pipeline through roadways, have not been determined at this time. When the specific locations are finalized, mitigation planning can also take place. Until such time, monitoring is recommended for those areas that manifest potential for subsurface remains. Full-time monitoring is recommended for all excavation in the corridors for Phases 2 and 5 as well as for the additional well sites. Spot checks and an archaeologist on-call is recommended for the rest of the pipeline corridors.

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SUPPLEMENT

to

WELL EXPLORATION AND DEVELOPMENT

East Maui Source Development

Water Resources Associates
Honolulu, Hawaii

January 1993

Supplement to
WELL EXPLORATION AND DEVELOPMENT
East Maui Source Development
January 1993

Streamflow

Perennial streams in the eastern part of the Haiku-Honopu area are more related to the occurrence of abundant mauka rainfall and a thick (100 to 150 ft.) formation of weathered andesites and andesitic basalts (Kula volcanic series) having low to moderate permeabilities. These two hydrogeologic conditions give rise to the occurrence of significant amounts of perched ground water in the Kula formation. The streams, which have eroded into the Kula formation, serve as natural drains of the perched ground water which result in perennial streamflows.

Below the Kula formation, older, permeable basalts of the Honomanu volcanic series occur. Unlike the Kuhiwa Well situation, the Kula and underlying Honomanu formations (between the coast and at least three to four miles inland) are not fully saturated. This conclusion is first based upon observations of unsaturated rock conditions above a near-sea level basal groundwater table in several wells in the Haiku area: Hamakuapoko 1 (5420-02), Hamakuapoko 2 (5320-01), Upper Haiku (5419-01), Haiku School (5519-01), and Baldwin Manor (5519-03). Secondly, no perennial flows or seepages are known to occur in Maliko Gulch. Maliko Gulch, which has eroded some 200 feet deep into the Kula lavas, is the deepest gulch within the Project area.

Any impact due to encountering possible high-level, perched ground water during well drilling will be short-term and temporary. Rigorous procedures will be followed for monitoring water levels and constructing each well. If any high-level, perched ground water is encountered during drilling, it will be sealed off with cement grout before further drilling is allowed to continue, as was done during the drilling of Hamakuapoko Well 1 (5420-02). Further, during final construction, the well will be cased with solid steel casing from the ground surface to sea-level elevation and the annular space between the casing and drill hole will be grouted with cement, securely sealing off any high-level, perched groundwater source which might possibly contribute to streamflow.

In summary, the proposed water development plan will have no long-term impact on any streamflows in the Haiku area because the plan consists entirely of basal water development having no effect on any perched groundwater (which feed some of the streams in the area) or any high-level, dike-confined ground water (which is not known to occur in the Haiku area).

Streamflow at Lower Elevations

Most streams in the Haiku area (where the EMPLAN proposes to develop basal groundwater at sea level) have elevated profiles and generally discharge into the ocean over a steep coastal sea cliff some 80 feet above sea level. Approximately a half mile inland of the sea cliff, most stream profiles are at an elevation of 200 ft. above sea level (see Interpretive Hydrogeologic Section). The intervening lava flows (Kula volcanic series) below the streams and the underlying basal groundwater table are unsaturated (otherwise, ground water would be perennially flowing out of the face of the coastal sea cliff. Some high-level ground water does occur in the near coastal area, as evidenced by sporadic seepages in the sea cliff during sustained rainy periods. Although such high-level, perched ground water may contribute to streamflows at lower elevations, neither perched ground water nor stream sources will be affected by the EMPLAN's development of the Haiku basal groundwater lens which has a head (static water level above mean sea level) of approximately 3 to 5 feet above sea level in the near coastal area.

Groundwater Underflow

The Haiku basal groundwater lens is thin near the coast, based upon a few reported heads in wells drilled near the coast. Based on an average head of 3 to 5 feet, the basal groundwater lens extends approximately 120 to 200 feet below sea level and discharges as underflow into the ocean in this interval of depth below sea level.

Underflow from the Haiku aquifer amounts to some 30 mgd (calculated as two times the sustainable yield of 15 mgd) and from the Paia aquifer, 17 mgd (Water Resources Protection Plan, June 1990). Such underflow becomes diffused or diluted with

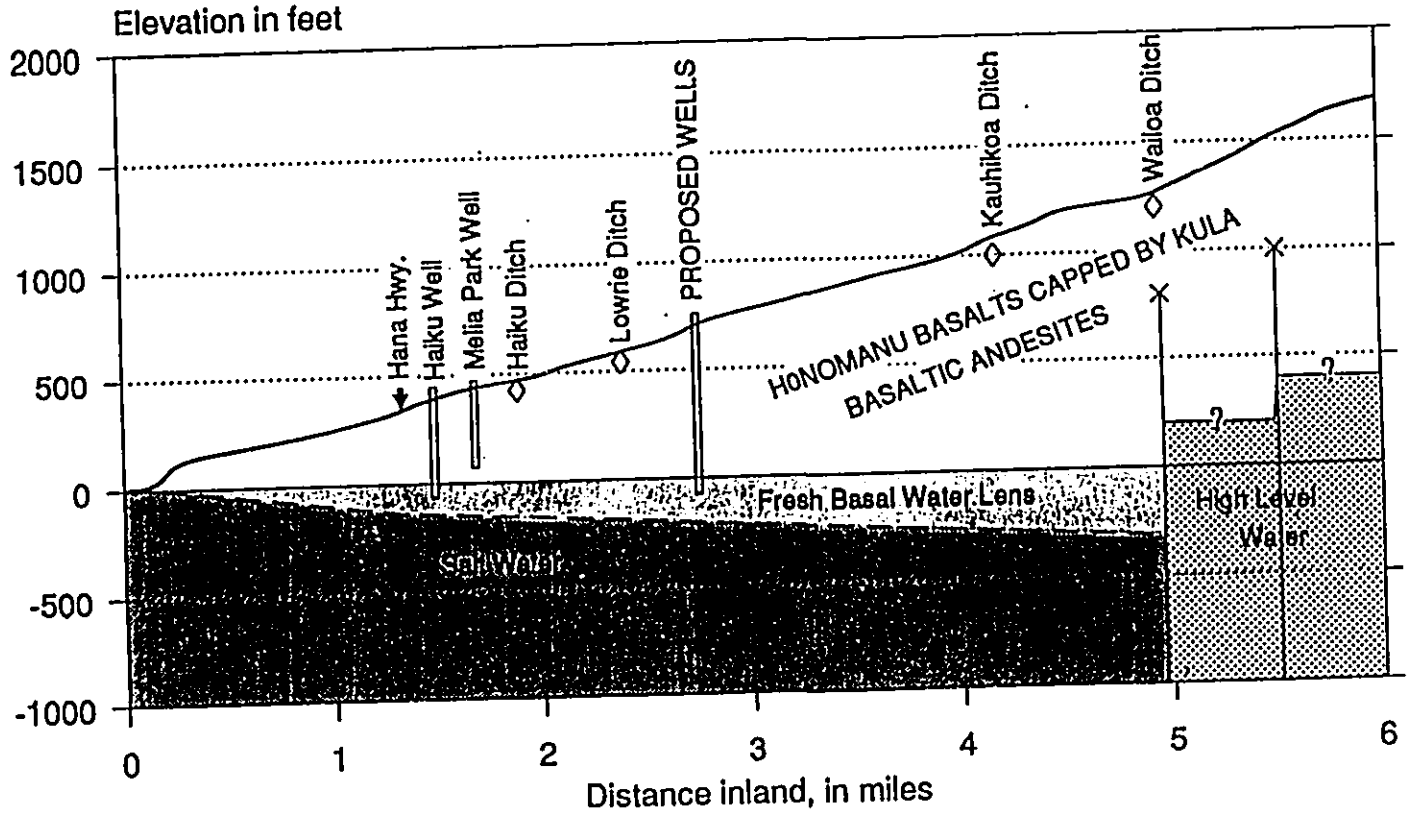
sea water as it moves through the permeable Honomanu lavas capped by less permeable Kula lavas which extend to the coast and beyond offshore.

The ultimate development of approximately 8.0 mgd from the Haiku basal aquifer and 1.3 mgd from the Paia basal aquifer, compared to an estimated diffused underflow of 30 mgd and 17 mgd, respectively, is not expected to have any significant impact on existing marine resources or conditions. Adverse impacts on marine resources resulting from similar basal groundwater developments elsewhere in the State have not, to the best of knowledge, been reported.

INTERPRETIVE HYDROGEOLOGIC SECTION

Haiku area

East Maui



Water Resource Associates
032

WELL EXPLORATION AND DEVELOPMENT

East Maui Source Development

Prepared for

Norman Saito Engineering Consultants, Inc.

Water Resource Associates

Honolulu, Hawaii
November 1991

EXHIBIT B

CONTENTS

TABLES

MAPS

- Wells to have anticipated pump capacities of one to two mgd each.
- Wells to be cased and tested at a depth of -30 ft., msl, before drilling any open hole. Maximum open hole depth of -60 ft., msl (if required by field conditions).
- Sites to be located along existing road or rights-of-way.

WELL EXPLORATION AND DEVELOPMENT PLAN

Priority	Well Site	Remarks
1	IA, IB	(under construction)
2	IIA	This site, located on State land, is recommended for the first well to be drilled east of Maliko Gulch. It is hydrologically well-located to initially test and develop the Haiku aquifer. The anticipated pump capacity is 1.0 to 1.5 mgd, from a basal lens with an expected head of 5 ft. or more. Primarily, because this site is expected to be readily available and is accessible by existing roads, it is a prime candidate for initial exploration and development. Test results at Site IIA will provide a more definitive hydrologic assessment of Site IIB before acquisition of the site. If aquifer conditions are sufficiently favorable to allow a well spacing of less than 2000 ft., a second well might also be possible as a standby and/or supplemental source on this 3.9-acre parcel. This site approximates Pumping Center 2.
3	IIB	This site, located in Haiku Lani Subdivision, approximates Pumping Center 1. It approaches the 2,000 ft. optimum spacing, being situated 1,500 ft. west of Site IIA. It is accessible from Kauhikoa Road, but would involve acquisition of a lot in the Haiku Lani Subdivision. The anticipated pump capacity at this site is 1.0 to 1.5 mgd. A

Priority	Well Site	Remarks
		first alternate to Site IIB would be a site (not shown on map 2) located 500 to 1000 ft. further west on the west side of Lilikoi Gulch. Such a site would be on one of several privately owned parcels with access to existing roadways being required. A second alternate to Site IIB is a 0.25-acre tank site shown as TMK 2-7-11:13 on Map 1, but not shown on Map 2. It is located 0.3 mile makai of the 700-foot elevation contour and a well at this site would be expected to have a pump capacity of 1/2 to 1 mgd. Based upon office investigations, a suitable well site with access does not seem to be available in Lilikoi Gulch. All of the above sites approximate Pumping Center 1.
4	IIIA	This site, located on West Kuiaha Road, is recommended for the first well approximating Pumping Center 3. Exploration and development at this site would be expected to proceed after Sites IIA and IIB have been developed. However, drilling at IIIA could be advanced at any time. The anticipated pump capacity is 1.5 mgd.
5	IIIB	Depending upon favorable groundwater conditions at Site IIIA, a second well may be hydrologically feasible located about 400 ft. from the well at Site IIIA. The anticipated pump capacity is 1.5 mgd. It should be noted that the priority between IIIA and IIIB may be reversed if desired. Site IIIB approximates Pumping Center 3.
6	IVA	This site is recommended for the first well approximating Pumping Center 4. It is favored by its location on East Kuiaha Road. The anticipated pump capacity is 2.0 mgd.

WELL EXPLORATION AND DEVELOPMENT
East Maui Source Development

OBJECTIVES

The plan for development of East Maui sources includes the exploration and development of wells in the Paia and Haiku aquifers of East Maui. Initial development consists of drilling and testing two wells west of Maliko Gulch in the Paia aquifer, with pump capacities of one mgd each. Subsequently, additional wells are to be located and developed east of Maliko Gulch in the Haiku aquifer which lies primarily within the northwest rift zone of East Maui. Exploratory drilling is expected to proceed incrementally eastward toward an increasingly water-rich area.

HYDROGEOLOGIC REVIEW

The hydrogeology of the Paia and Haiku aquifers has been previously studied and reported in the Central Maui Water Study, Part II, prepared for the Maui Department of Water Supply by Norman Saito Engineering Consultants, Inc. (February 1991). The Paia aquifer in the Hamakuapoko area consists of a thin basal lens with a mauka-to-makai water table gradient of 1.6 ft./mile, based upon a reported head of 4.3 ft. in the upper Haiku well (see Table 1). The sustainable yield of the Paia aquifer has been estimated at 2 to 3 mgd (Central Maui Water Study, Part II).

The Haiku aquifer lies mostly within a 2.7-mile wide rift zone defined by two separate alignments of volcanic vents. Although no surface exposures have been discovered, associated dikes with a northwesterly trend presumably occur beneath these two alignments and, if so, may have an influence on groundwater conditions and directions of flow. However, evidence of any groundwater conditions affected by dikes in the rift zone must await further exploratory drilling. Reported heads of 3.4 ft. in the Haiku School (Pauwela) well and 5.0 ft. in the Baldwin Manor well, indicate a higher water table gradient in the Haiku aquifer than in the Paia aquifer which in turn suggest greater groundwater recharge as would be expected in a higher rainfall area (see Table 1 and Map 1). A sustainable yield of 15 mgd has been estimated for the Haiku aquifer

which extends from Maliko Gulch eastward along the coast to Kakipi Gulch, a distance of about 5½ miles (Central Maui Water Study, Part II).

The Haiku School and Baldwin Manor wells are the only wells which tap the Haiku basal aquifer. They are located a little over a mile inland from the coast (see Map 2) and yield ground water with a chloride content of 120 and 150 ppm, respectively. Their heads and chloride content indicate that the western part of the Haiku aquifer consists of a thin, unconfined basal lens of fresh water. No wells have been drilled in the eastern part of this aquifer, but based upon rainfall occurrence (see Map 1), it is reasonable to conclude that significantly more ground water should be available in that area. Assuming similar geologic conditions, the basal lens in the eastern part of the aquifer should be thicker, allowing larger capacity wells to be developed.

CRITERIA FOR WELL LOCATION AND DESIGN

Based upon experience and an analysis of all available hydrogeologic data, development of the Haiku basal aquifer can best be achieved by: (1) establishing an alignment of *pumping centers* located approximately two miles inland from the coastline, and (2) spacing the centers approximately 2,000 feet apart. At each pumping center, one and possibly two wells with pumping capacities of one to two mgd each, are contemplated (see Map 2). Hopefully, other site selection criteria, such as land ownership, accessibility, and other engineering factors can be incorporated without causing any major deviation from the two criteria listed above. The fundamental design criteria for well construction and testing are based upon achieving minimum aquifer penetration and maximum pumping capacity appropriate to the sustainable yield and thickness of the aquifer.

The criteria for well site location and well design are summarized as follows:

- Sites to be located approximately two miles inland from coast.
- Sites to be spaced approximately 2,000 feet apart.
- Sites to be located at an elevation of approximately 700 feet.

Priority	Well Site	Remarks
7	IVB	This site is considered hydrologically favorable for a well which would be located midway between Pumping Centers 3 and 4. The anticipated pump capacity for a well on this site is 2.0 mgd.
8	VA	This site is recommended as a favorable well site. It is readily accessible along an existing road and is suitably located midway between Pumping Centers 5 and 6. Hydrologic conditions are expected to be favorable and the anticipated pump capacity is 2.0 mgd.
9	VB	This site approximates Pumping Center 6 and is, therefore, well-located in terms of optimum well spacing. The anticipated pump capacity is also 2.0 mgd.

SUMMARY

In summary, two well sites have been located in the Paia aquifer for an anticipated total pumping capacity of 2.0 mgd, and eight prospective well sites have been located in the Haiku aquifer east of Maliko Gulch for an anticipated total Haiku aquifer pumping capacity of 14 mgd (see Map 2 and Table 2). This planned 14-mgd capacity is based upon present knowledge of the Haiku Aquifer as a thin basal lens which presumably becomes thicker and receives greater recharge east of Maliko Gulch toward an increasingly water-rich area a few miles away. The planned capacity is also based upon the aquifer's estimated sustainable yield of 15 mgd.

Selection of prospective well sites in the Haiku aquifer has been based upon an alignment of pumping centers located two miles inland from the coast and spaced 2000 ft. apart, modified by other considerations such as land ownership (for availability), accessibility, and other engineering factors.

Because well data in the Haiku aquifer is limited, the proposed exploration and development plan has depended upon general knowledge and experience in exploring and developing basal aquifers elsewhere in the State. Therefore, the well exploration plan

presented herein should be considered a dynamic one; well locations, pumping quantities, and dates of establishment can be expected to be subject to change as each new well is drilled and pumping test results are evaluated.

Table 1. Well Record

Name or Location	State Well No.	Year Drilled	Ground Elev. (ft.)	Csg. Dia. (in.)	Csg. Depth (ft.)	Well Depth (ft.)	Static Head (ft.)	Pump Cap. (mgd)	Chl. (ppm)	Use
Baldwin Manor	5519-03	1986	446	8	480	480	5	0.5	150	Dom
Feehan #1	5516-01			6		135				Unu
Feehan #2	5516-02			4		123				Unu
Haiku (Behnke)	5519-02	1974	360	4		228	210			Dom
Haiku (Upper)	5419-01	1979	828	12	859	869	4.3			Unu
Haiku School (Pauwela)	5519-01	1967	365	8	382	400	3.4		120	Unu
Maliko Tunnel	5620-01		50							
Maui High School	5420-01	1964	349	8	370	371	3.4		82-93	Irr
Melia Park	5518-01		400	4		320				Irr
Peahi Gusher	5515-01	1972	448	4	48	250				Dom
Pump 11 (Maliko Sh 32)	5520-01	1898	30					6.81	350-975	
Pump 12 (Kuau)	5522-01	1933	156				4.0	6.80	187-305	Irr
Pump 13 (Paia Mill)	5422-01	1923	155			150	3.8	13.39	166-453	
Pump 17 (Paia)	5422-02	1938	552				6.2	29.95	115-780	
Pump 18 (Kaheka)	5321-01	1932	295				4.0	11.61	185-343	Irr

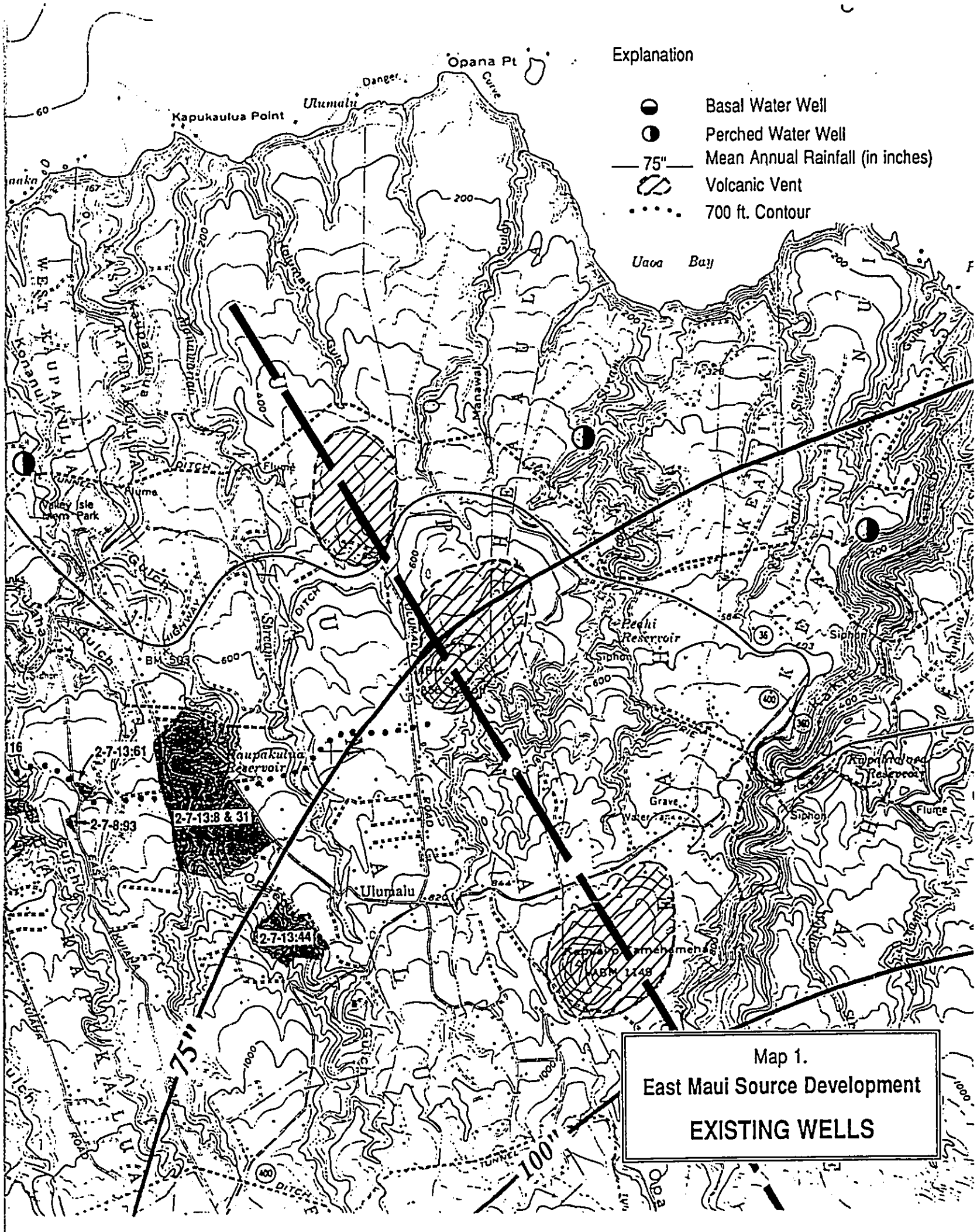
Source of Data: Division of Water Resource Management, Department of Land and Natural Resources.

Table 2. Preliminary Well Design Criteria

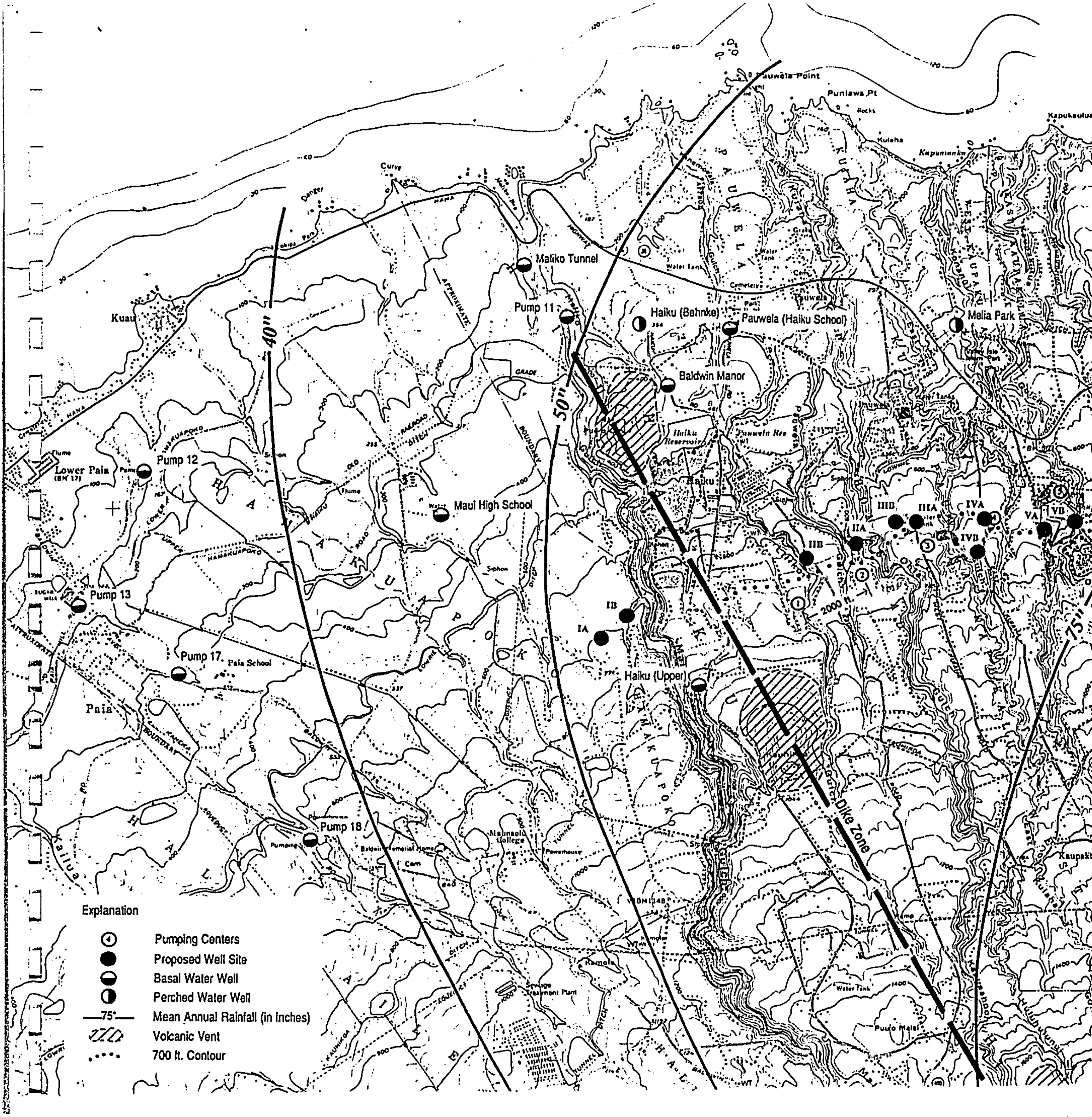
Site	IA	IB	IIA	IIB	IIIA	IIIB	IVA	IVB	VA	VB
Ground elevation, approximate (ft)	700	660	620	660	700	680	710	648	680	680
Casing I.D. (inches)	12	12	14	14	14	14	14	14	14	14
Solid casing depth (ft)	690	650	610	650	690	670	700	638	670	670
Perforated casing depth (ft)	730	690	650	690	730	710	740	670	710	710
Open hole* depth (ft)	760	720	680	720	760	740	770	690	740	740
Anticipated pump capacity (mgd)	1.0	1.0	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0

*If required by field conditions.

Pauwela Point
Puniawa Pt
Rocks
Kuiaha
Kapukaulu
Curve
HANA
HIGHWAY
APPROXIMATE
BOUNDARY
GRADE
RAILROAD
DITCH
Water Tank
Cemetery
Pauwela
Park
Haiku
Valley Isle
Mem Park
Flume
Water Tanks
Pauwela
Haiku
Reservoir
Pauwela Res
WT
Siphon
LOWRIE
50"
75"
2-7-3:1
2-7-3:56
2-7-8:15
2-7-8:116
2-7-13:61
2-7-11:13
2-7-8:8&16
2-7-8:32
2-7-8:93
2-7-3:33
2-7-8:33
2-7-13:8 & 3
Water
Tank
North
0
2000 ft.
Scale
Kauhikoa



Map 1.
East Maui Source Development
EXISTING WELLS



Pauwela Point
Puniawa Pt
Kapukaulua
Maliko Tunnel
Pump 11
Haiku (Behnke)
Pauwela (Haiku School)
Melia Park
Baldwin Manor
Kuau
Lower Paia
Pump 12
Maui High School
Pump 13
Pump 17
Paia School
Paia
Haiku (Upper)
Pump 18
Maunaolu College
Haiku
Haiku Reservoir
IA
IB
IIA
IIB
IIIA
IIID
IVA
IVB
VA
VB
40"
50"
75"
2000 ft.
Dike Zone
Kaupakulua
Puuo Halai
Explanation
Pumping Centers
Proposed Well Site
Basal Water Well
Perched Water Well
75" Mean Annual Rainfall (in inches)
Volcanic Vent
700 ft. Contour

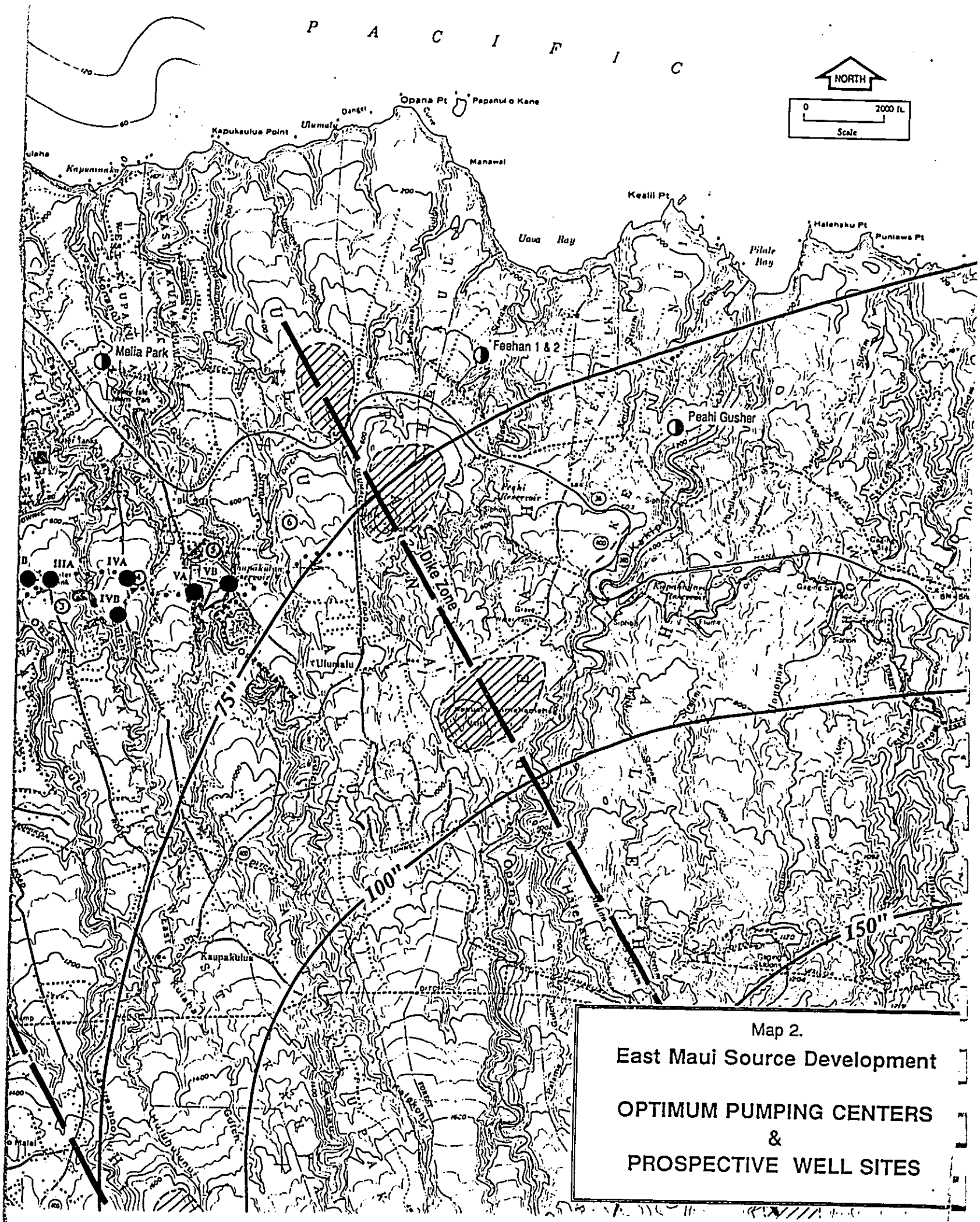
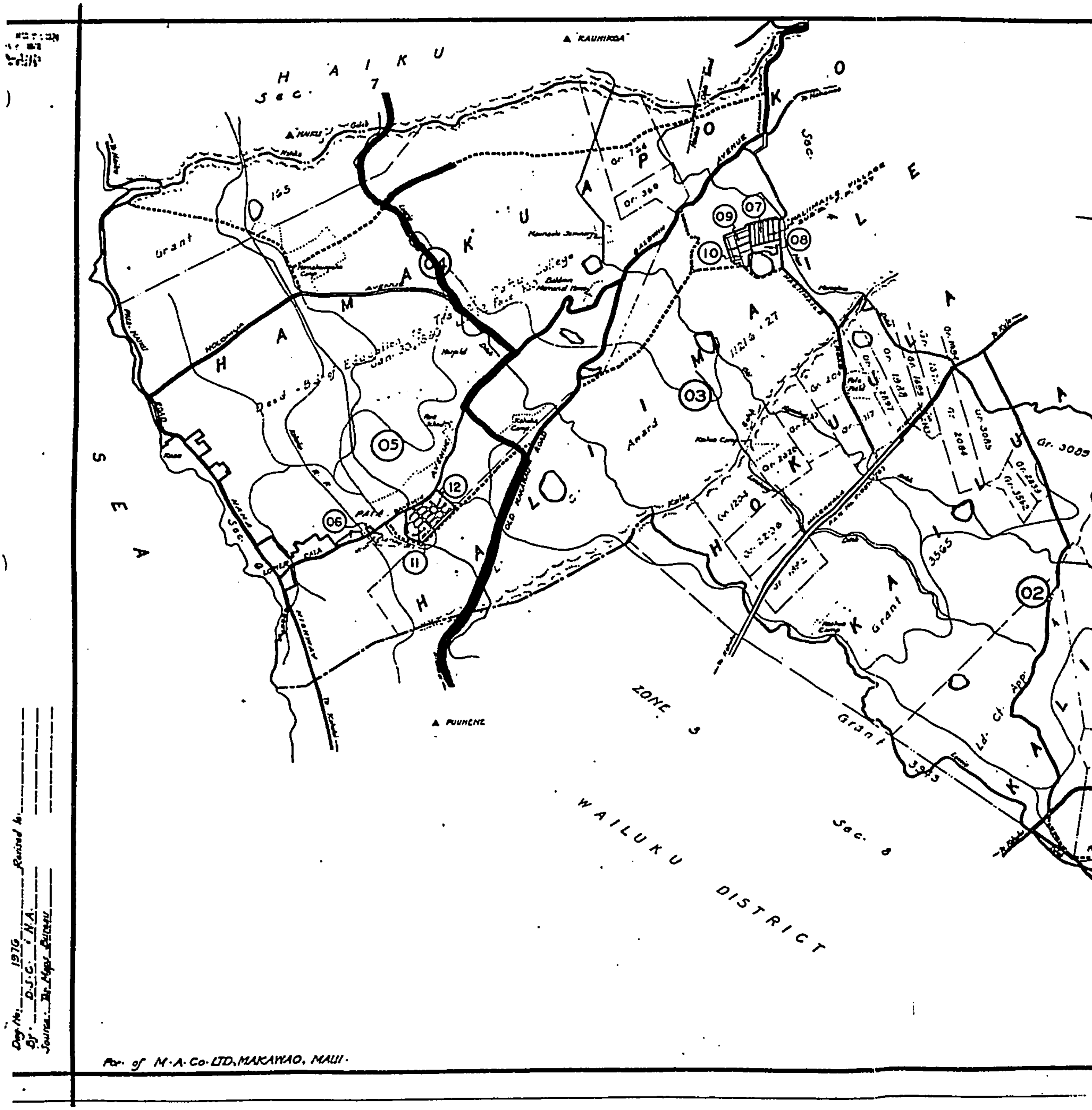
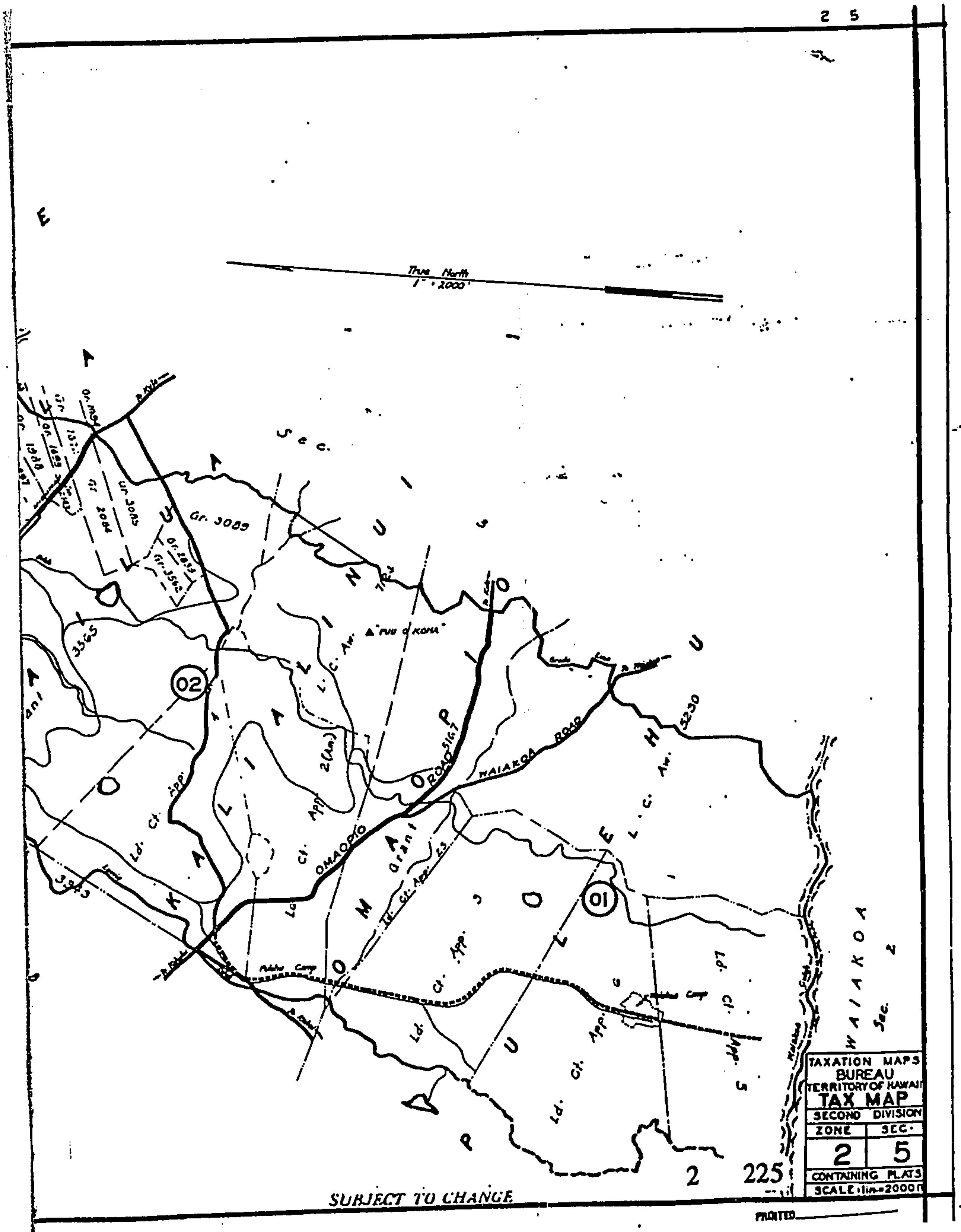
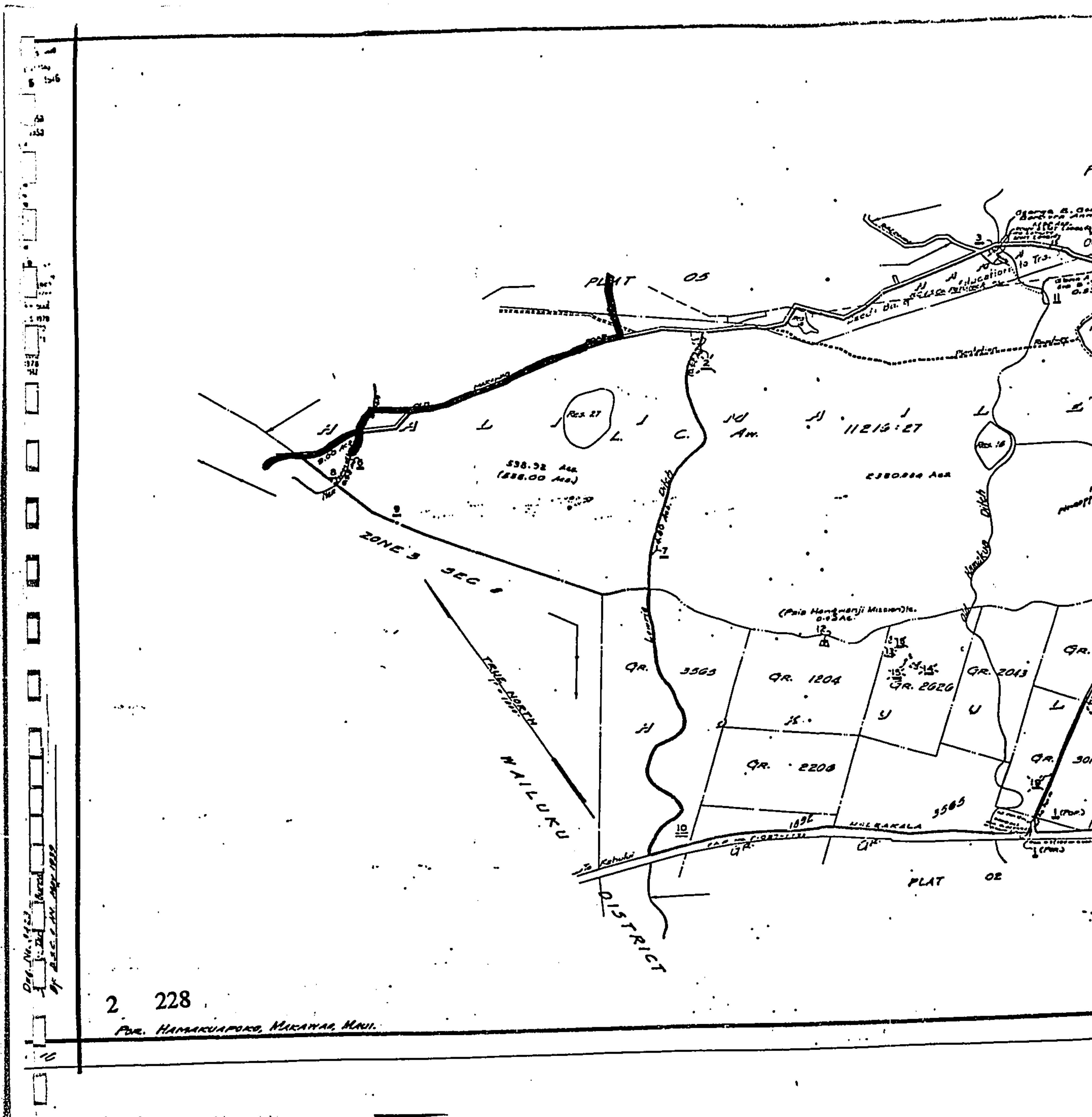

P A C I F I C
NORTH
0
2000 ft.
Scale
Opana Pt
Papanui o Kane
Kapukaulua Point
Ulumalu
Manawai
Kealii Pt
Halehaku Pt
Puniawa Pt
Uaua Bay
Pilale Bay
Melia Park
Feehan 1 & 2
Peahi Gusher
Dike Zone
75"
100"
150"
IIIA
IVA
IVB
VA
VB
Ulumalu
Kaupakulua
Map 2.
East Maui Source Development
OPTIMUM PUMPING CENTERS
&
PROSPECTIVE WELL SITES

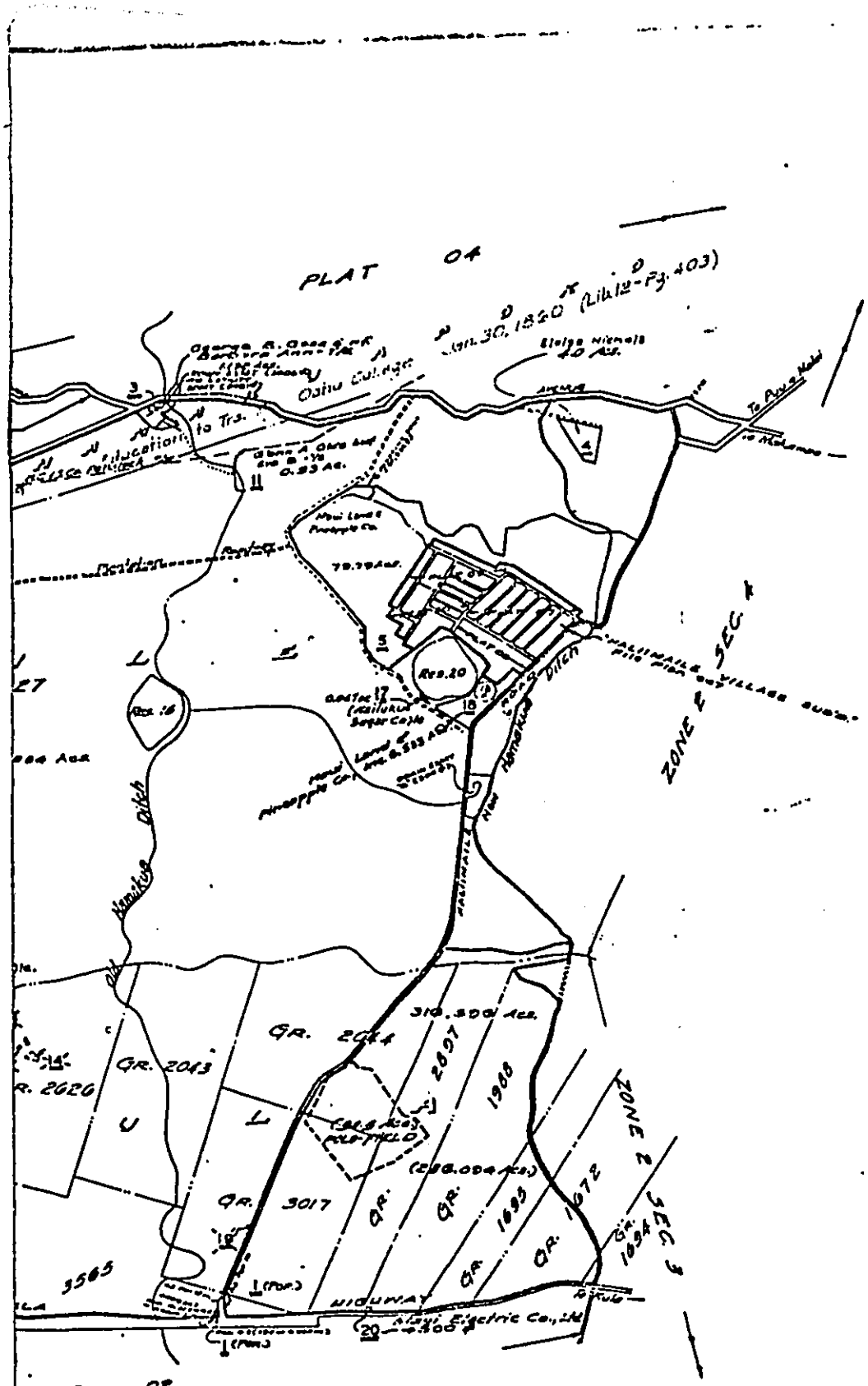
EXHIBIT C

TAX MAP KEYS


H A I K U
Sec. 7
KAUNIKOA
H A M A K U A P O K O
SEA
Grant
PAIA
HALIIMAILE
Sec. 8
ZONE 3
WAILUKU DISTRICT
PUUNENE
01
02
03
04
05
06
07
08
09
10
11
12
Dwg No: 1976
By: D.S.C. / H.A.
Revised by:
Source: Tax Maps Bureau
Por. of M.A. Co. LTD., MAKAWAO, MAUI.


2 5
True North
1" = 2000'
Sec.
Gr. 3089
PUU O KOHA
02
01
OMAOPIO
ROAD 5167
WAIAKOA ROAD
5230
L. C. Aw.
Ld. Ct. App.
Pulehu Camp
WAIAKOA
Sec. 2
TAXATION MAPS
BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE
SEC.
2
5
CONTAINING PLATS
SCALE: 1in=2000 ft
2
225
SUBJECT TO CHANGE
PRINTED


PLAT 05
PLAT 02
ZONE 3 SEC 8
TRUE NORTH
WAILUKU
DISTRICT
Res. 27
Res. 16
538.92 Acs.
(556.00 Acs.)
2380.884 Acs.
11216:27
(Paia Hongwanji Mission)
Gr. 3565
Gr. 1204
Gr. 2626
Gr. 2013
Gr. 2206
Lowrie Ditch
Hamakua Ditch
to Kahului
2 228
Por. Hamakuapoko, Makawao, Maui.



Note: Parcels 1, 6, 7, 8, 9, 10, 18, 19, 17, owned by Alexander & Baldwin, Inc. unless otherwise noted.

ADVANCE SHEET
SUBJECT TO CHANGE

Parcel Dropped: 13, 14, 15, 16

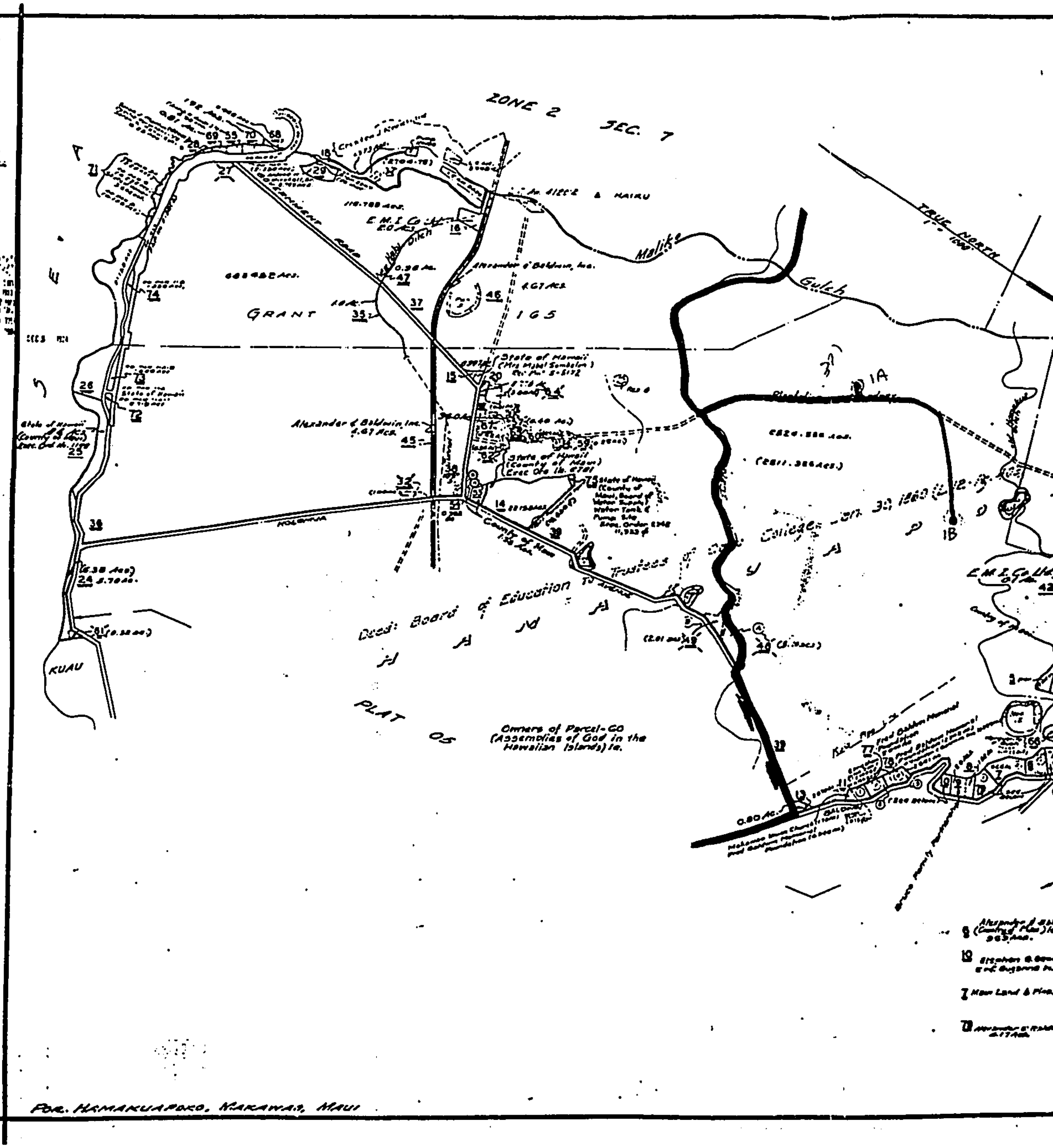
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP

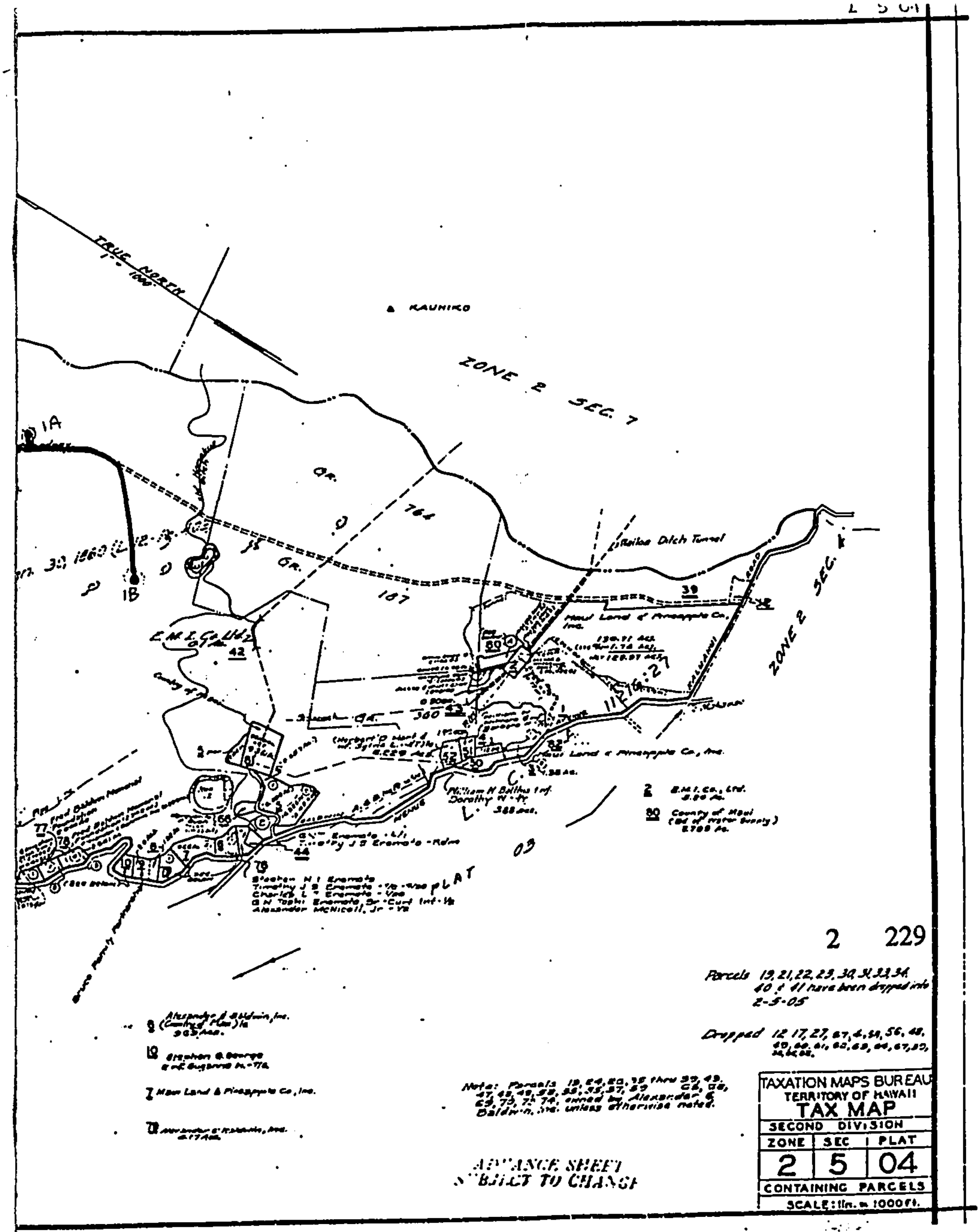
SECOND DIVISION

ZONE	SEC	PLAT
2	5	03

CONTAINING PARCELS

SCALE: 1 in. = 1000 ft.


ZONE 2 SEC. 7
TRUE NORTH
Maliko Gulch
GRANT 165
Alexander & Baldwin, Inc.
Alexander & Baldwin Inc. 4.67 Acs.
State of Hawaii (County of Maui)
Deed: Board of Education
PLAT 05
KUAU
Owners of Parcel-60 (Assemblies of God in the Hawaiian Islands) Ie.
POR. HAMAKUAPOKO, MAKAWAO, MAUI


TRUE NORTH
KAUHIKO
ZONE 2 SEC. 7
ZONE 2 SEC. 4
Koiloa Ditch Tunnel
E.M.I. Co. Ltd.
Maui Land & Pineapple Co., Inc.
William H Baldwin 1/2
Dorothy H 1/2
2 E.M.I. Co., Ltd.
80 County of Maui (Bd of Water Supply)
PLAT 03
2 229
Parcels 19, 21, 22, 23, 30, 31, 33, 34, 40 & 41 have been dropped into 2-5-05
Dropped 12, 17, 27, 67, 4, 54, 56, 48,
8 Alexander & Baldwin, Inc.
7 Maui Land & Pineapple Co., Inc.
Note: Parcels 19, 24, 20, 35 thru 39, 43, 47, 48, 49, 52, 53, 55, 57, 59, 65, 68, 69, 73, 71, 74, owned by Alexander & Baldwin, Inc. unless otherwise noted.
ADVANCE SHEET
SUBJECT TO CHANGE
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE | SEC | PLAT
2 | 5 | 04
CONTAINING PARCELS
SCALE: 1 in. = 1000 ft.

All parcels listed below owned by Alexander & Baldwin, Inc. & leased, unless otherwise noted.

23 (Standard Oil Co.)Ic

0.86 ac.
0.60 ac.

44 (East Maui Baptist Church)Ic 0.78 Ac.

7 (Bishop First National Bank)Ic. 0.20 ac.

9 1.67 ac.

10 1.14 ac.

52 Trustees of the Board of Missions of the Christian Association of Wailuku, Inc. - 0.97 ac.

53 (United States International University)Ic. - 0.66 Ac.

Alexander & Baldwin, Inc.
784.698 Ac.

1009.23 Acs.
(1038.88 Acs.)

State of Hawaii
(Dept. of Pub. Instr.)
Const. Agmt. No. 797
IAO Jr. High School

Alexander & Baldwin, Inc.
1.03 Ac.

(Paia Hongwanji Mission)Ic

(County of Maui)Ic

Ranges No. 1 thru 4
2.38 Acs.

KUAU

PAIA

HANA HIGHWAY

MOLOKAIA

PUUHENE A

ROAD

HOSPITAL

BALDWIN AVENUE

860.854 Acs.

KAHEKA

OLD MAKAWAO

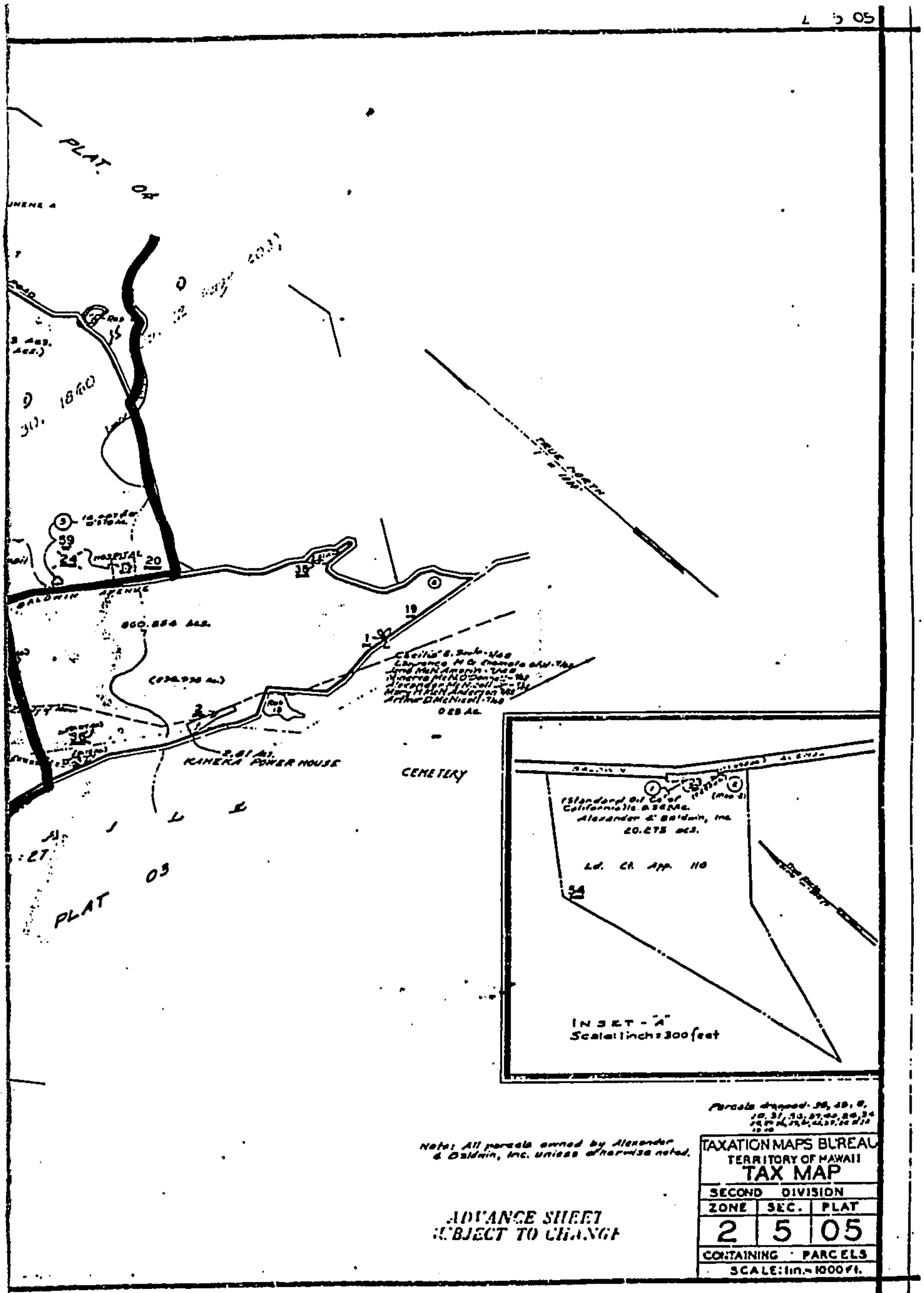
PLAT

WAILUKU

ZONE 3 SEC. 8 DISTRICT

Roman Catholic Church in the State of Hawaii - 2.00 Acs.
Alexander & Baldwin, Inc. - 0.31 ac.
Hawn. Telephone Co. - 0.037 & or 0.138 ac.

2 230
FOR. HAMAKUAPOKO, MAKAWAO MAUI


2 5 05
PLAT 04
BALDWIN AVENUE
HOSPITAL
20
39
19
860.884 Acs.
KAHEKA POWER HOUSE
CEMETERY
PLAT 03
INSET - "A"
Scale: 1 inch = 300 feet
Alexander & Baldwin, Inc.
Ld. Ct. App. 110
54
Note: All parcels owned by Alexander & Baldwin, Inc. unless otherwise noted.
ADVANCE SHEET
SUBJECT TO CHANGE
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE 2
SEC. 5
PLAT 05
CONTAINING · PARCELS
SCALE: 1 in. = 1000 ft.

L.C.A. 3336

TRUE NORTH

ULUMALU

SECTION 8

EAST

KAUPAKULUA

SEA

Hanawaiiau Gulch

L.C. Aw. 10474

Gr. 771

Gr. 383

Gr. 217

Gr. 226

Gr. 141

Gr. 3080

Gr. 594

Gr. 140

Gr. 166

Gr. 144

Gr. 220

Gr. 121

Gr. 138

Gr. 6470 49.58 Ac

Gr. 6555 35.91 Ac

Gr. 6556 34.63 Ac

Gr. 6557 34.18 Ac

Gr. 6671 62.85 Ac

Gr. 6669 49.50 Ac

Gr. 6469 43.25 Ac

Gr. 6434 35.37 Ac

Gr. 6360 34.58 Ac

Gr. 6827 38.78 Ac

Gr. 6415 42.77 Ac

Gr. 6416 30.89 Ac

Gr. 6084 31.42 Ac

Gr. 6428 42.34 Ac

Gr. 6468 42.37 Ac

Gr. 6358 23.68 Ac

Gr. 6333 31.08 Ac

Gr. 7169 24.08 Ac

Gr. 7497 42.13 Ac

Gr. 7439 38.10 Ac

Gr. 7179 42.64 Ac

Gr. 7489 38.39 Ac

Gr. 1883 31.98 Ac

Gr. 1684 39.81 Ac

Gr. 8096 36.60 Ac

Gr. 7833 37.72 Ac

Gr. 1821 37.57 Ac

Gr. 1016 36.86 Ac

COOPER PARK TRACT

PAUWELA ILLAC

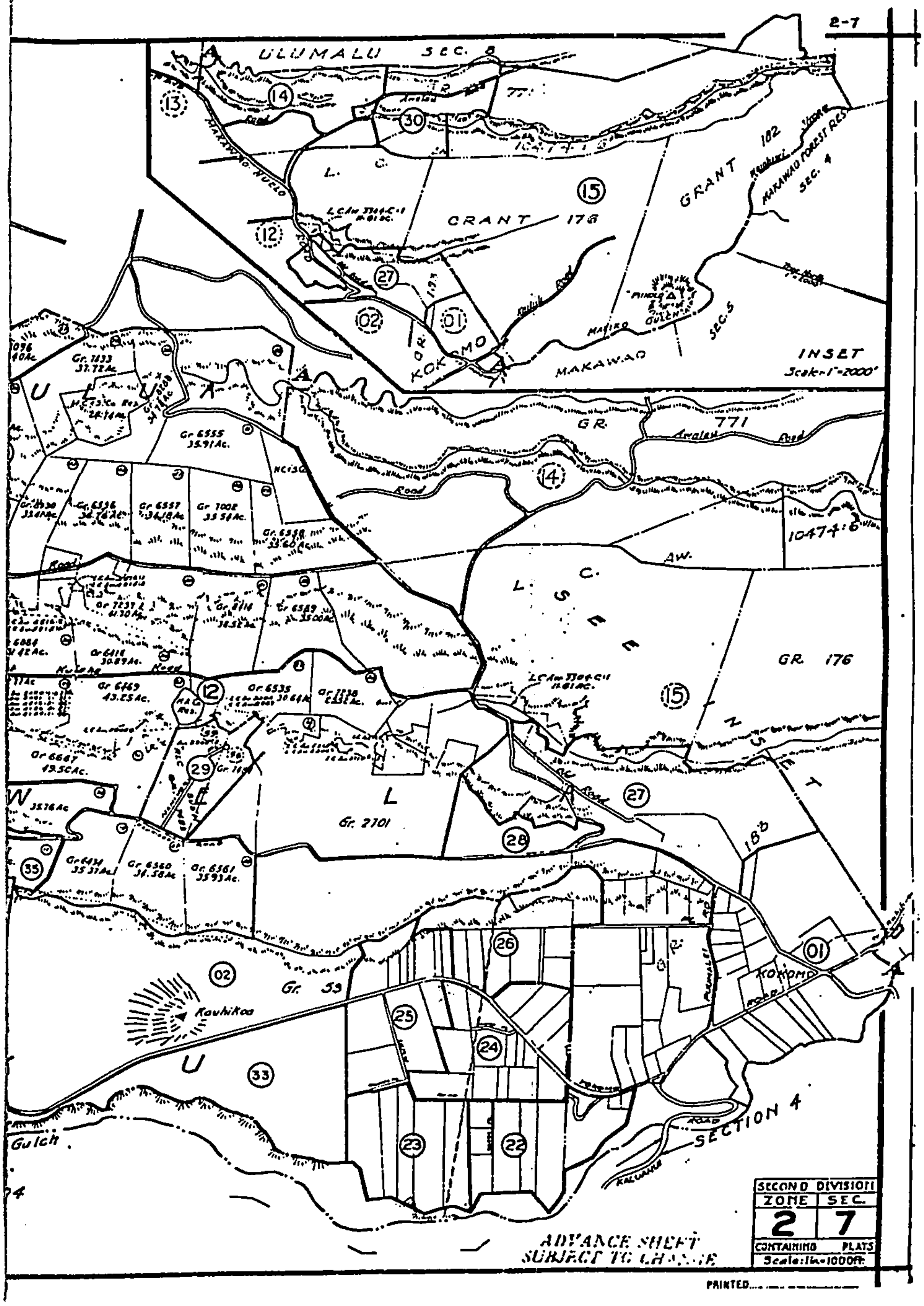
Maliko Gulch

SECTION 5 PLAT 04

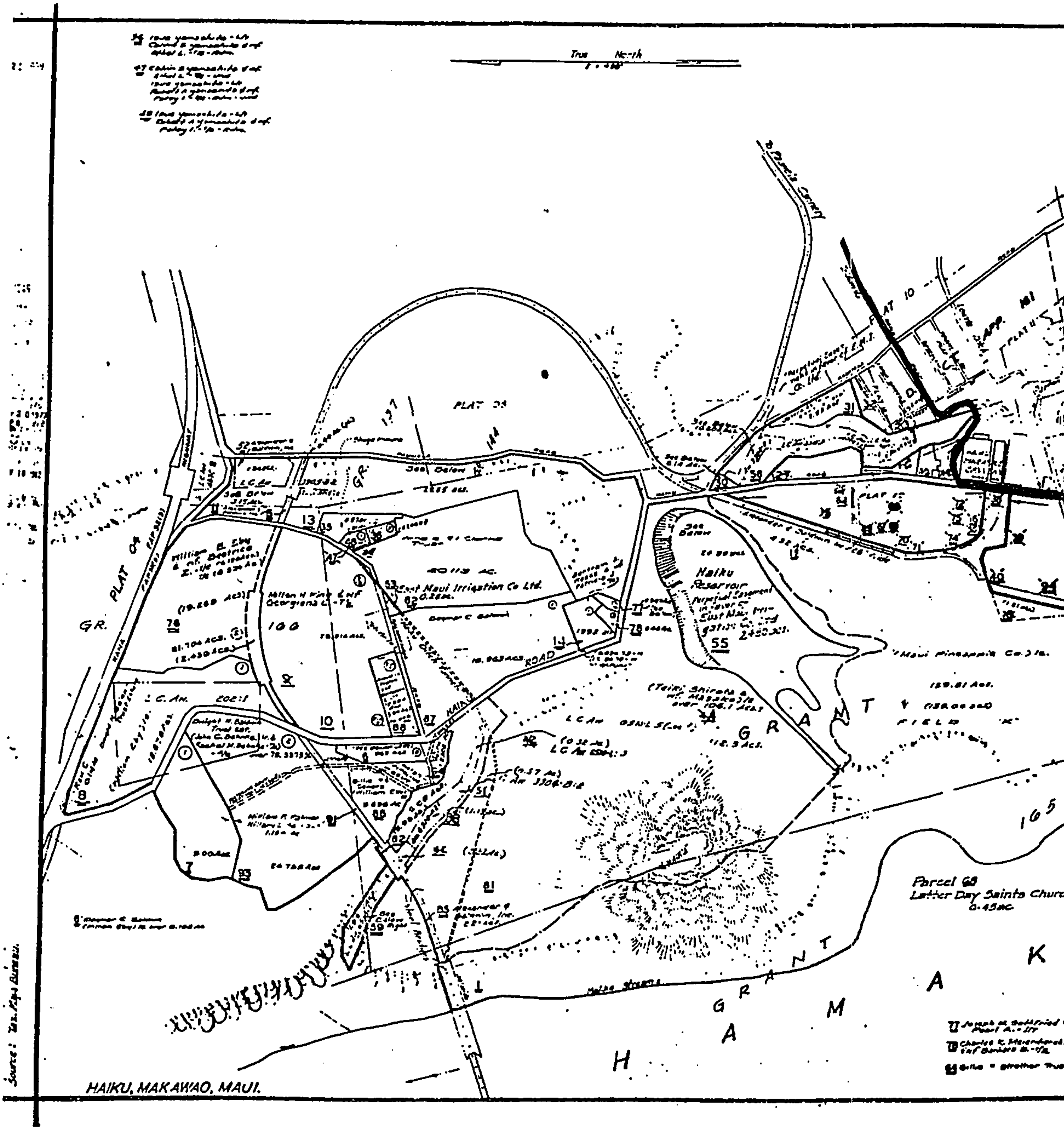
HAMAKUAPOKO

2 252

HAIKU & KUIAHA · PAUWELA · KAUPAKULUA HM503 — MAKAWAO · MAUI

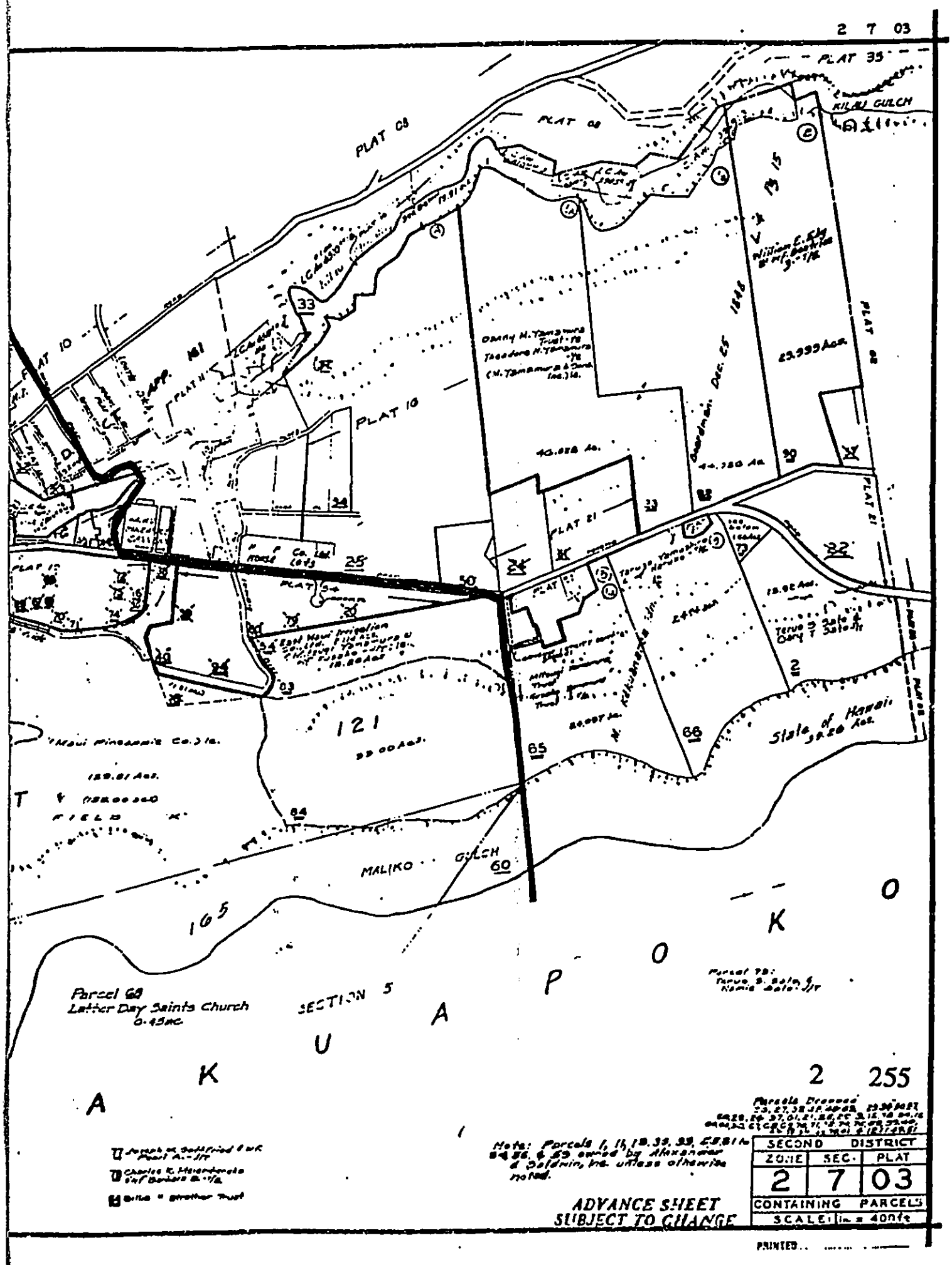


2-7
ULUMALU SEC. 8
Amalau Road
GRANT 176
GRANT 182
MAKAWAO FOREST RES. SEC. 4
SEC. 5
KOKOMO
MAKAWAO
INSET
Scale 1"=2000'
GR. 771
Amalau Road
10474:6
L. C. AW.
GR. 176
Gr. 6555 35.91 Ac.
Gr. 7002 35.58 Ac.
Gr. 6416 30.89 Ac.
Gr. 6469 43.25 Ac.
Gr. 6535
Gr. 6667 49.5 C Ac.
Gr. 2701
Gr. 6560
Gr. 6561 35.93 Ac.
Gr. 53
Kauhikoa
KOKOMO
SECTION 4
ROAD
KALUANUI
Gulch
ADVANCE SHEET
SUBJECT TO CHANGE
SECOND DIVISION
ZONE 2
SEC. 7
CONTAINING PLATS
Scale: 1 in.=1000 ft.
PRINTED

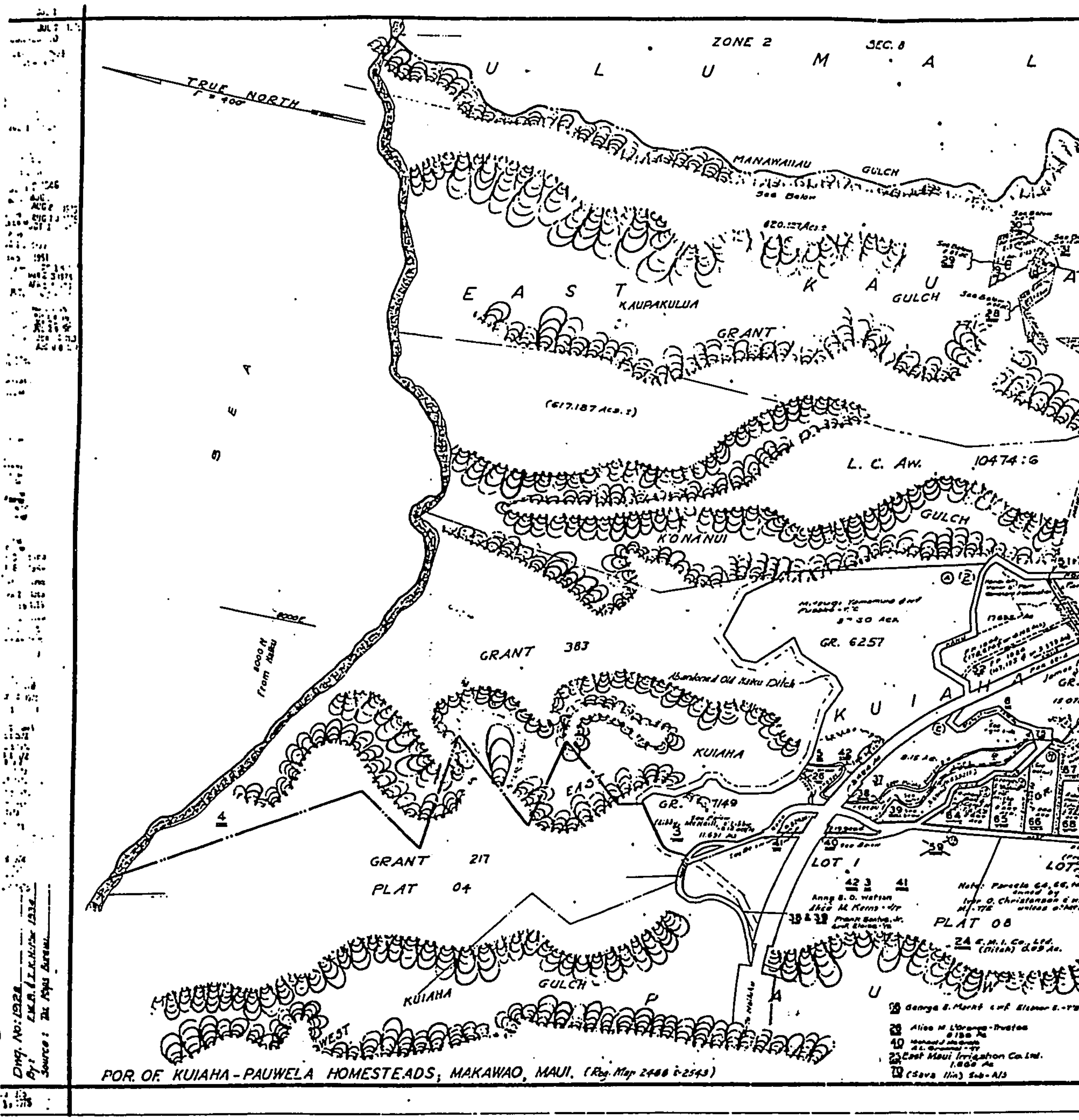


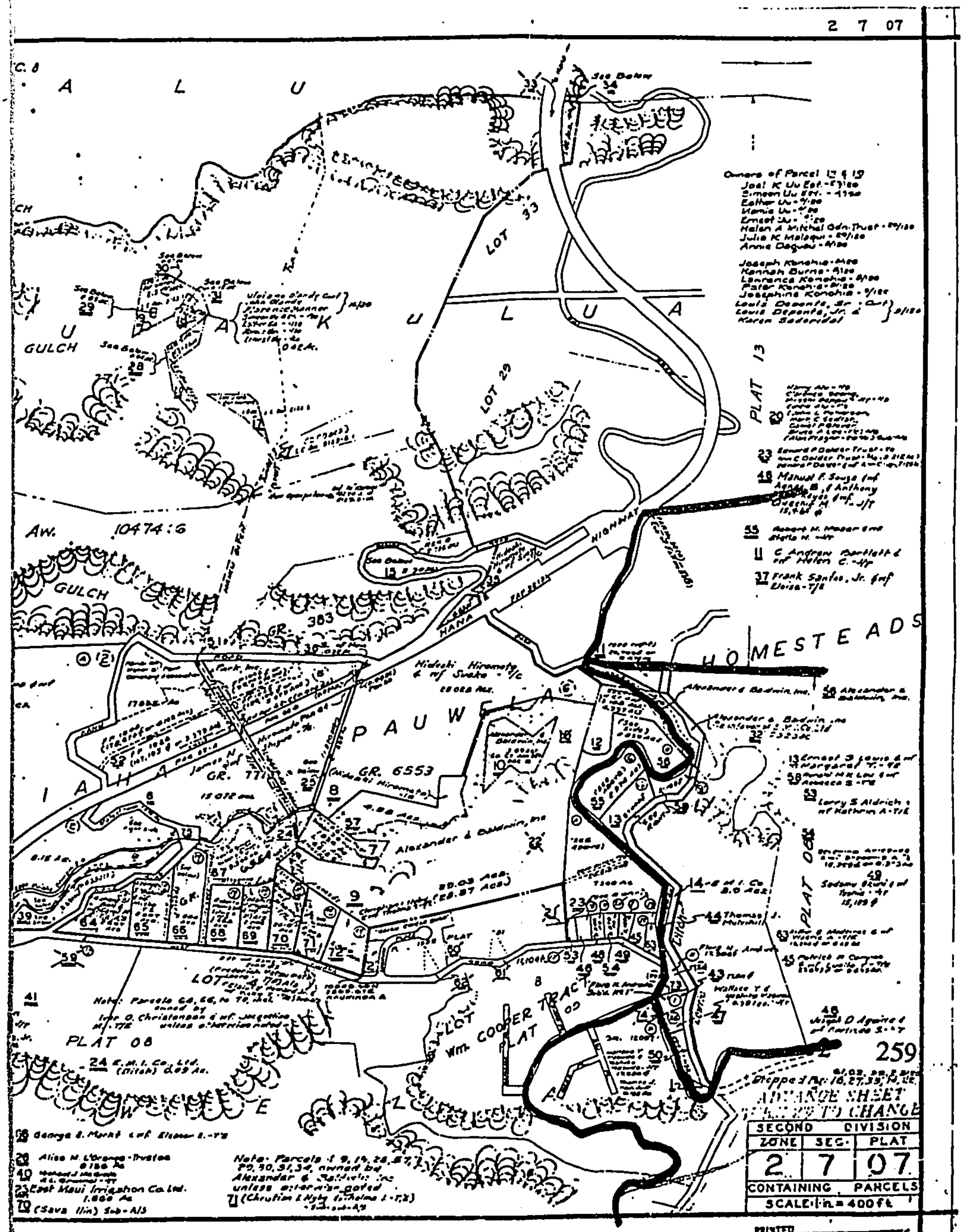
True North
PLAT 35
PLAT 04
GR.
HANA
East Maui Irrigation Co Ltd.
ROAD
HAIKU
Haiku Reservoir
55
100
10
G R A N T
FIELD
Maui Pineapple Co.
Parcel 68
Latter Day Saints Church
0.45 Ac.
165
G R A N T
H A M A K
Source: Terr. Maps Bureau.
HAIKU, MAKAWAO, MAUI.

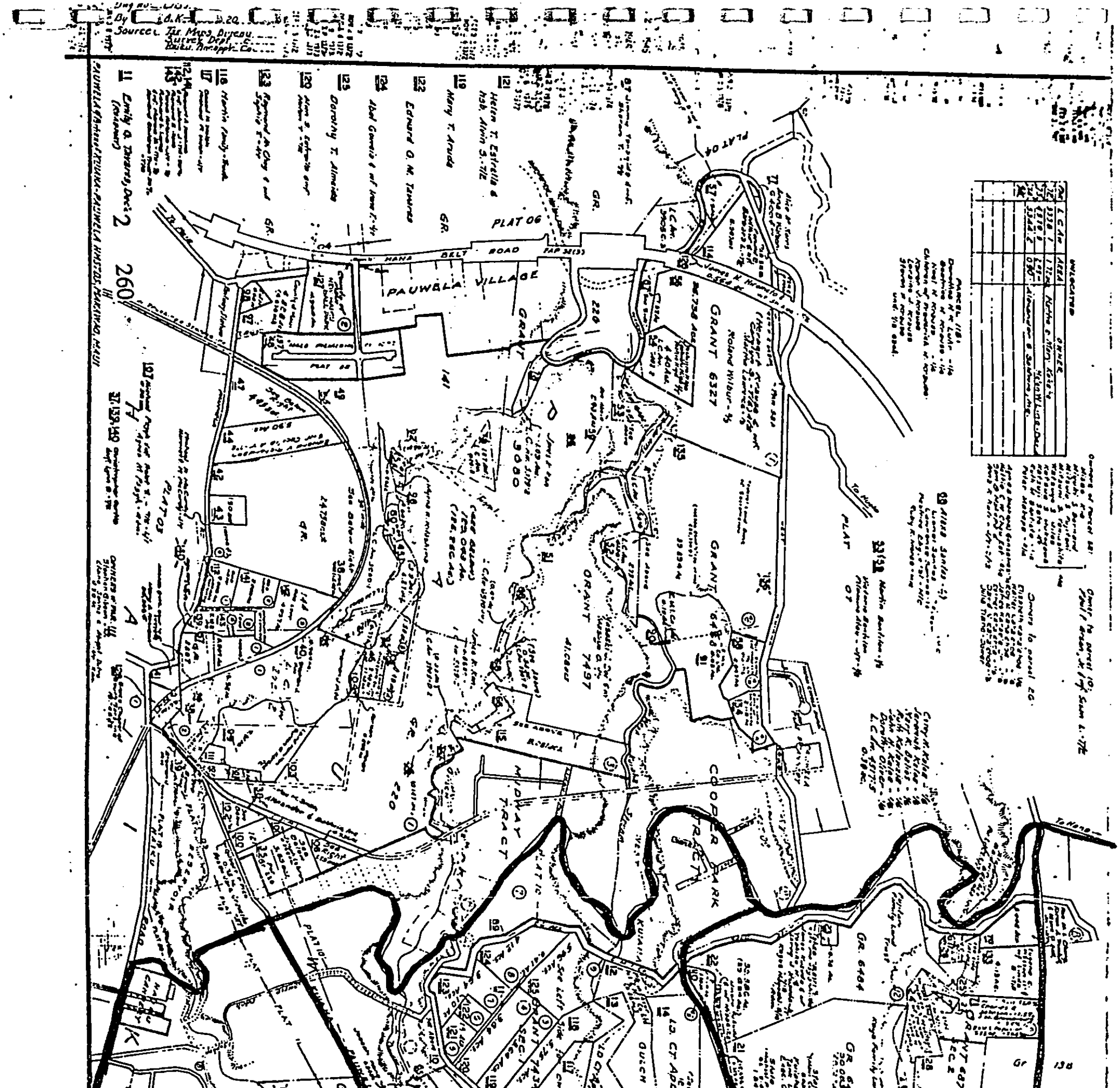
2 7 03



SECOND DISTRICT		
ZONE	SEC.	PLAT
2	7	03
CONTAINING		PARCELS
SCALE:	1 in. = 400 ft.	

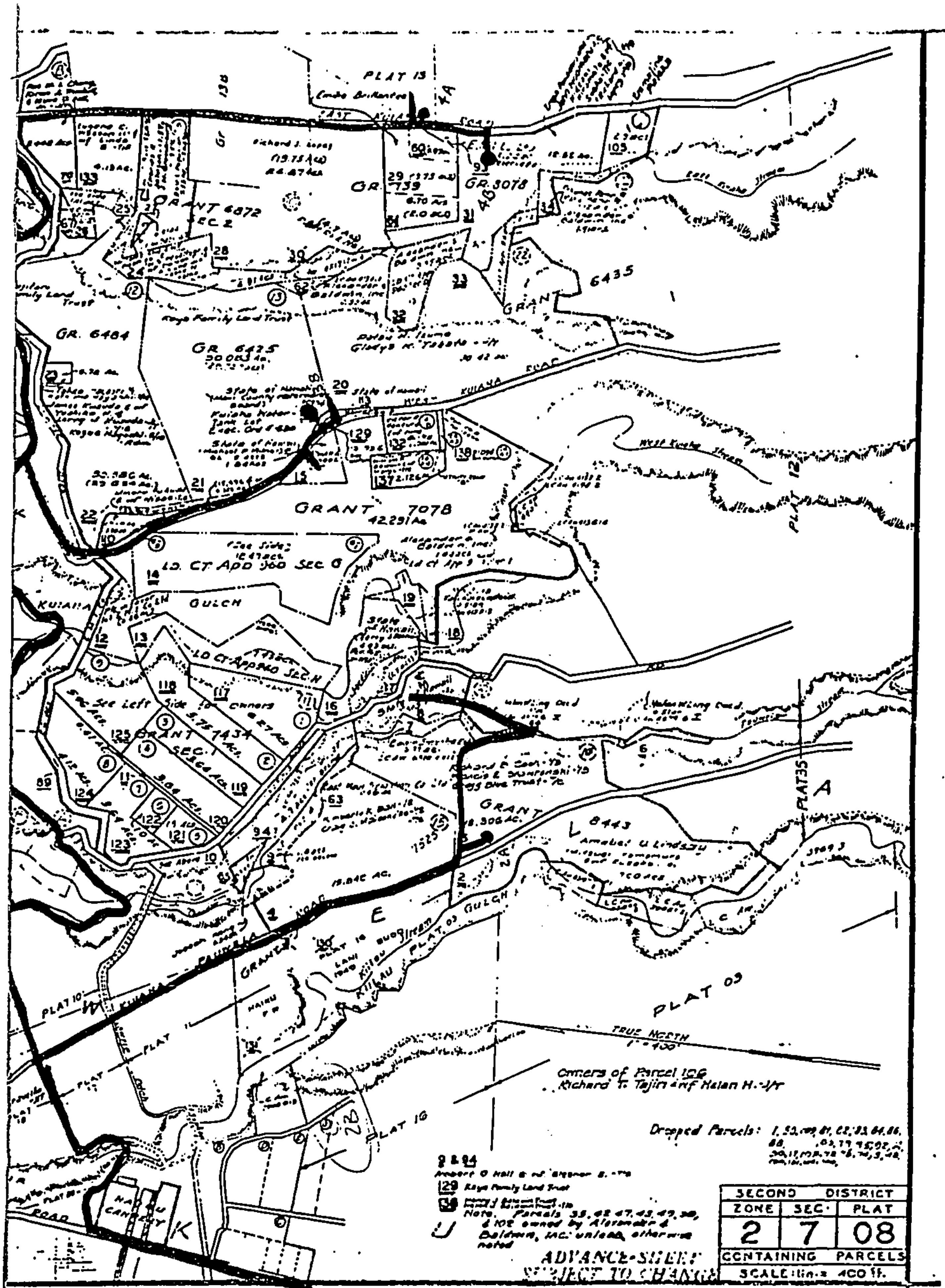

ZONE 2
SEC. 8
ULUMALU
TRUE NORTH
MANAWAIAU GULCH
See Below
EAST KAUPAKULUA
KAU GULCH
GRANT
(617.187 Acs. ±)
L. C. Aw. 10474:6
GULCH
KONANUI
GRANT 383
GR. 6257
Abandoned Old Haiku Ditch
KUIAHA
EAST
GR. 7149
GRANT 217
PLAT 04
LOT 1
PLAT 08
KUIAHA
GULCH
WEST
SEA
8000 ft from Haiku
East Maui Irrigation Co. Ltd.
POR. OF KUIAHA-PAUWELA HOMESTEADS; MAKAWAO, MAUI. (Reg. Map 2486 & 2543)
Dwg. No: 1928
Source: Tax Maps Bureau

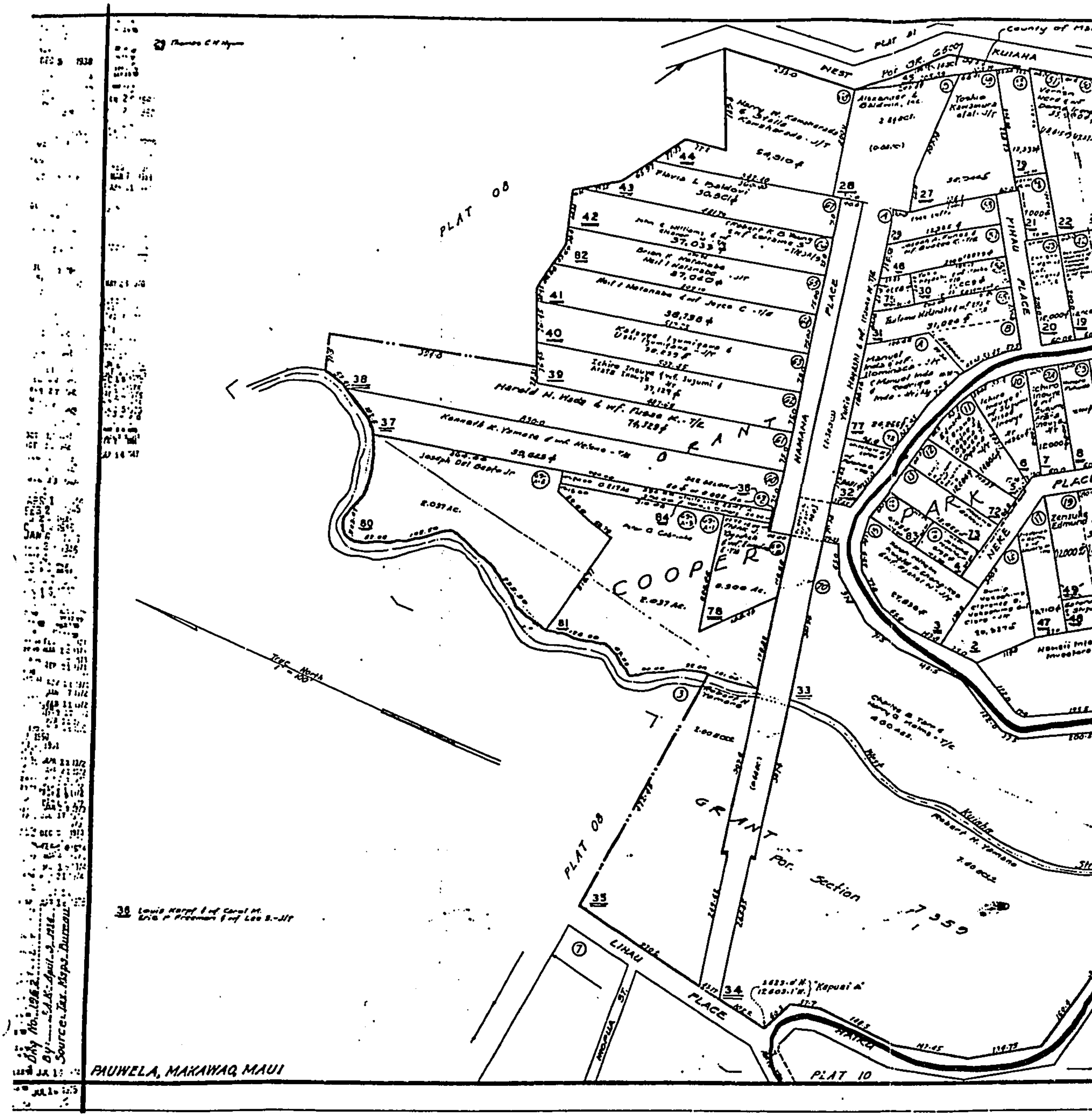

2 7 07
A L U
U A K U L U A
GULCH
AW. 10474:6
GULCH
GR. 383
HANA HIGHWAY
HOMESTEADS
P A U W E L A
GR. 6553
I A H A
LOT 33
LOT 29
PLAT 13
PLAT 08
PLAT 06
Wm. COOPER TRACT
Alexander & Baldwin, Inc
Owners of Parcel 12 & 19
Manuel F. Souza
Frank Santos, Jr. & wf Eloise
Larry S Aldrich & wf Kathrin A
Thomas J. Mulvihill
24 E.M.I. Co. Ltd. (Ditch) 2.09 Ac.
East Maui Irrigation Co. Ltd.
259
ADVANCE SHEET
SUBJECT TO CHANGE
SECOND DIVISION
ZONE SEC. PLAT
2 7 07
CONTAINING PARCELS
SCALE: 1 in. = 400 ft.
PRINTED

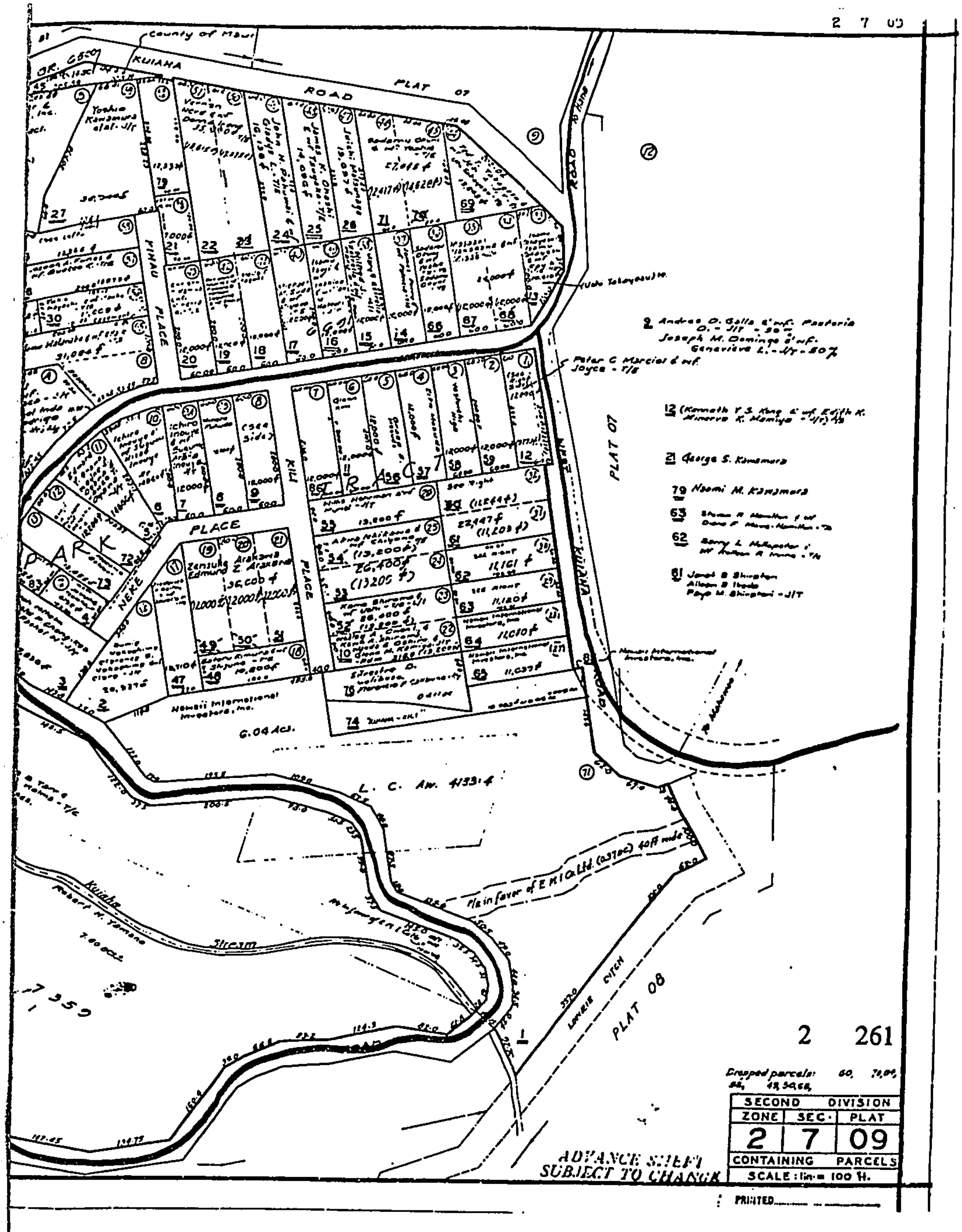


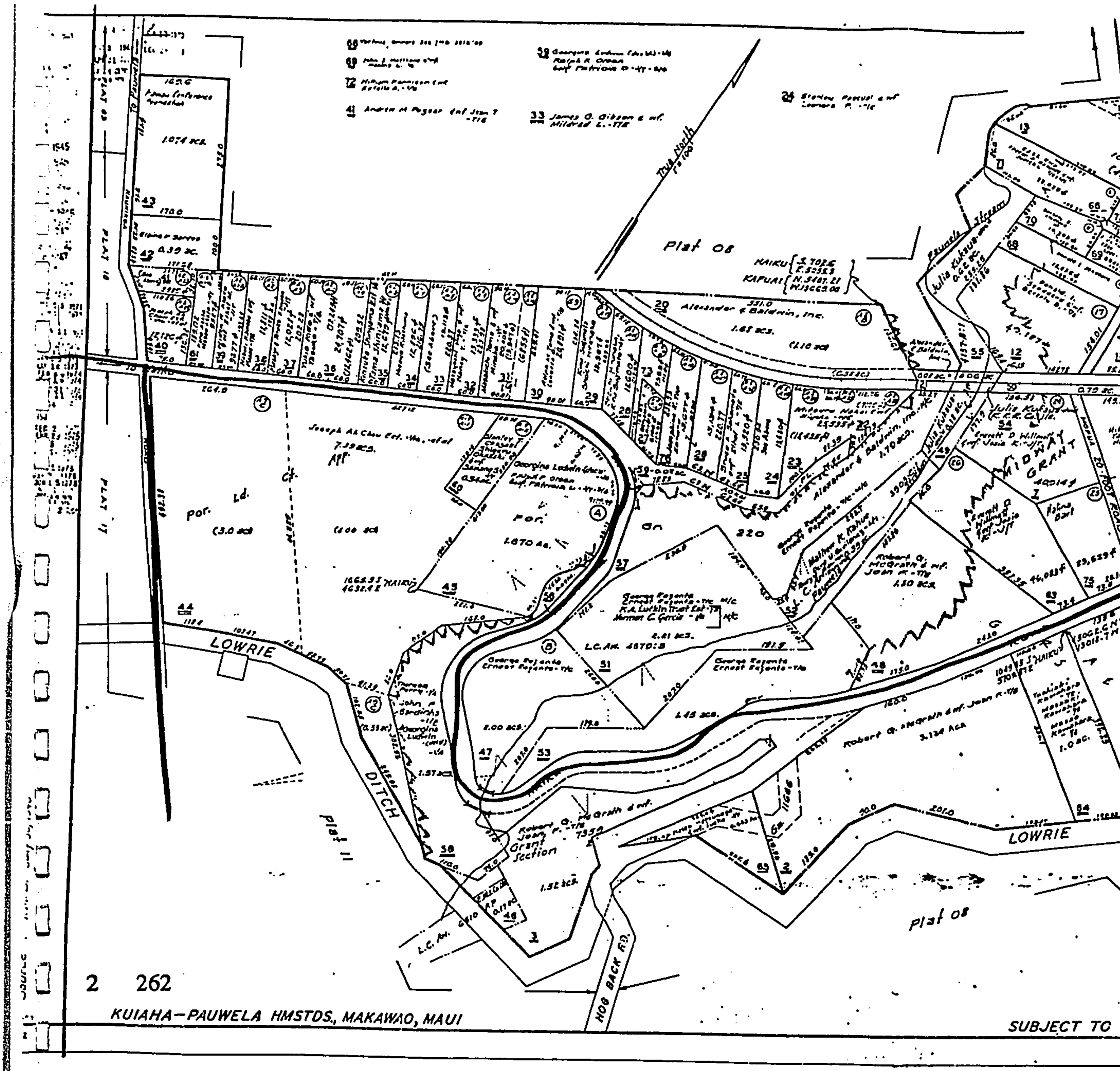
Par.	L C Aw	AREA	OWNER
72	3338 : 1	1.72 ac.	Martha & Mary Kekahe
73	4510 : B	2.09	Helen W. Lima-Dec'd
74	3344 : C	0.90	Alexander & Baldwin, Inc.
96			

2 260

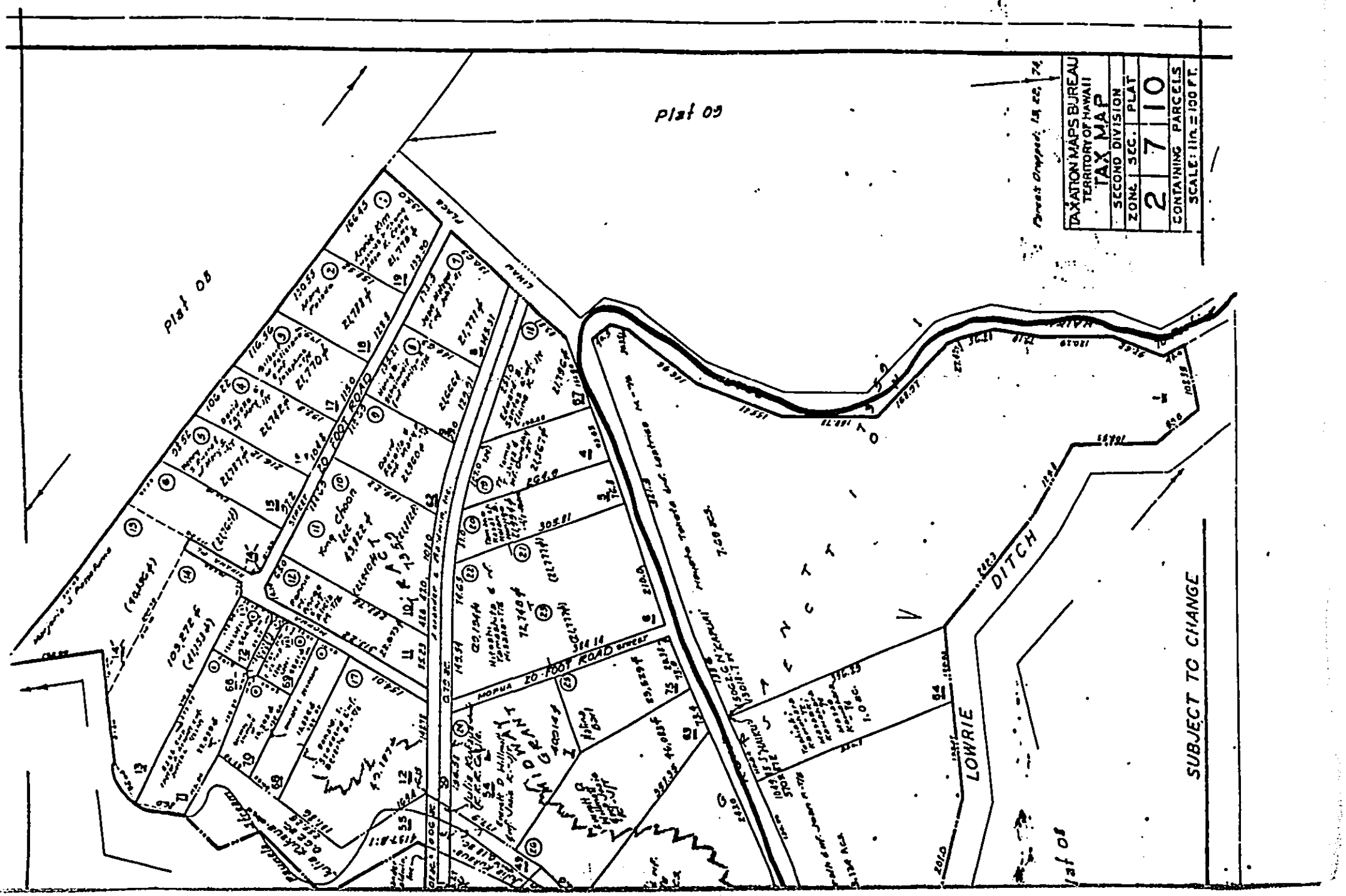

PLAT 13
GRANT 6872
SEC. 2
GR. 6484
GR. 6425
GR. 739
GR. 3078
GRANT 6435
Kaya Family Land Trust
KUIAHA ROAD
GRANT 7078
42.291 Ac.
LD. CT. APP 360 SEC. G
GULCH
GRANT 1434
GRANT 8443
PLAT 12
PLAT 35
PLAT 03
PLAT 10
PLAT 16
TRUE NORTH
Owners of Parcel 106
Richard T. Tajiri &wf Helen H.-J/T
Dropped Parcels:
129 Kaya Family Land Trust
Note. Parcels
Baldwin, Inc. unless otherwise noted
ADVANCE SHEET
SUBJECT TO CHANGE
SECOND DISTRICT
ZONE SEC. PLAT
2 7 08
CONTAINING PARCELS
SCALE: 1in.= 400 ft.


PAUWELA, MAKAWAO, MAUI
PLAT 08
PLAT 08
PLAT 10
HAMANA
PLACE
LIHAU
PLACE
PIHAU
PLACE
KUIAHA
COOPER
GRANT
GRANT
Por. Section
7359
Harold H. Hada & wf. Fusae K.-T/C
Joseph Del Bosto Jr.
Source: Tax Maps Bureau

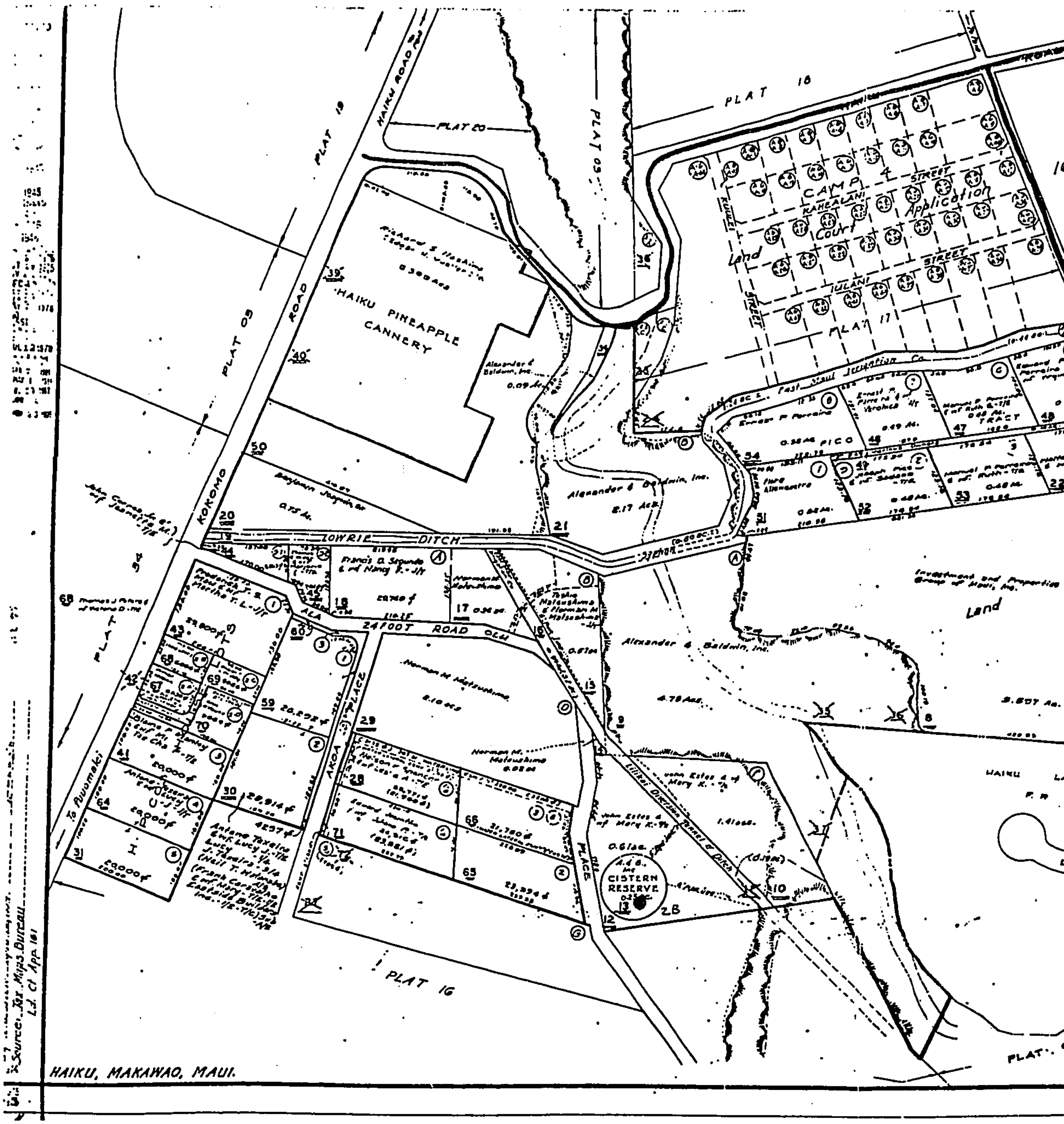

2 7 09
County of Maui
KUIAHA ROAD
PLAT 07
PIHAU PLACE
PLACE
NEKE
KILI PLACE
PARK
ROAD
PLAT 07
PLAT 08
L. C. Aw. 4133:4
Kuiaha Stream
G.04 Acs.
Hawaii International Investors, Inc.
2 Andres O. Gallo & wf. Pastoria O. - J/T - 50%
Joseph M. Domingo & wf. Genevieve L. - J/T - 50%
12 (Kenneth Y.S. King & wf. Edith K. Minerva K. Mamiya - J/T) 13
21 George S. Kawamura
79 Naomi M. Kawamura
61 Janet S. Shiraton
Aileen S. Ikeda
Faye M. Shiratori - J/T
Peter C Marcial & wf. Joyce - T/E
2 261
Dropped parcels: 60, 76, 84, 85, 48, 54, 56
SECOND DIVISION
ZONE | SEC. | PLAT
2 | 7 | 09
CONTAINING PARCELS
SCALE: 1in = 100 ft.
ADVANCE SHEET SUBJECT TO CHANGE
PRINTED



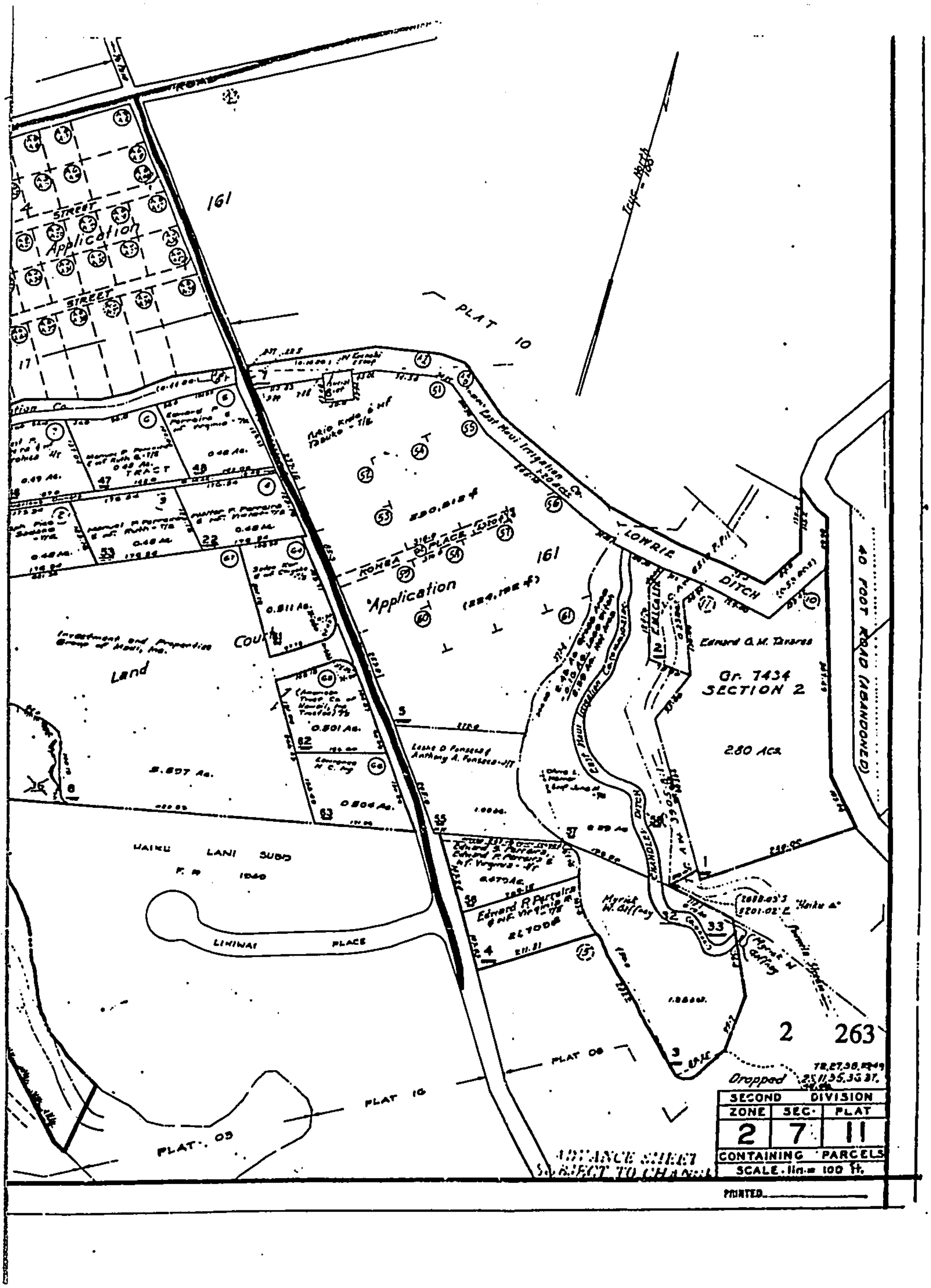
Plat 08
HAIKU
KAPUAI
True North
Alexander & Baldwin, Inc.
1.68 acs.
Pauwela Stream
MIDWAY GRANT
20-FOOT ROAD
PLAT 17
PLAT 18
Por. Ld.
LOWRIE
DITCH
Plat 11
L.C. Aw. 4870:8
Robert G. McGrath & wf. Jean F.
Grant Section
HOG BACK RD.
LOWRIE
Plat 08
2 262
KUIAHA-PAUWELA HMSTDS., MAKAWAO, MAUI
SUBJECT TO



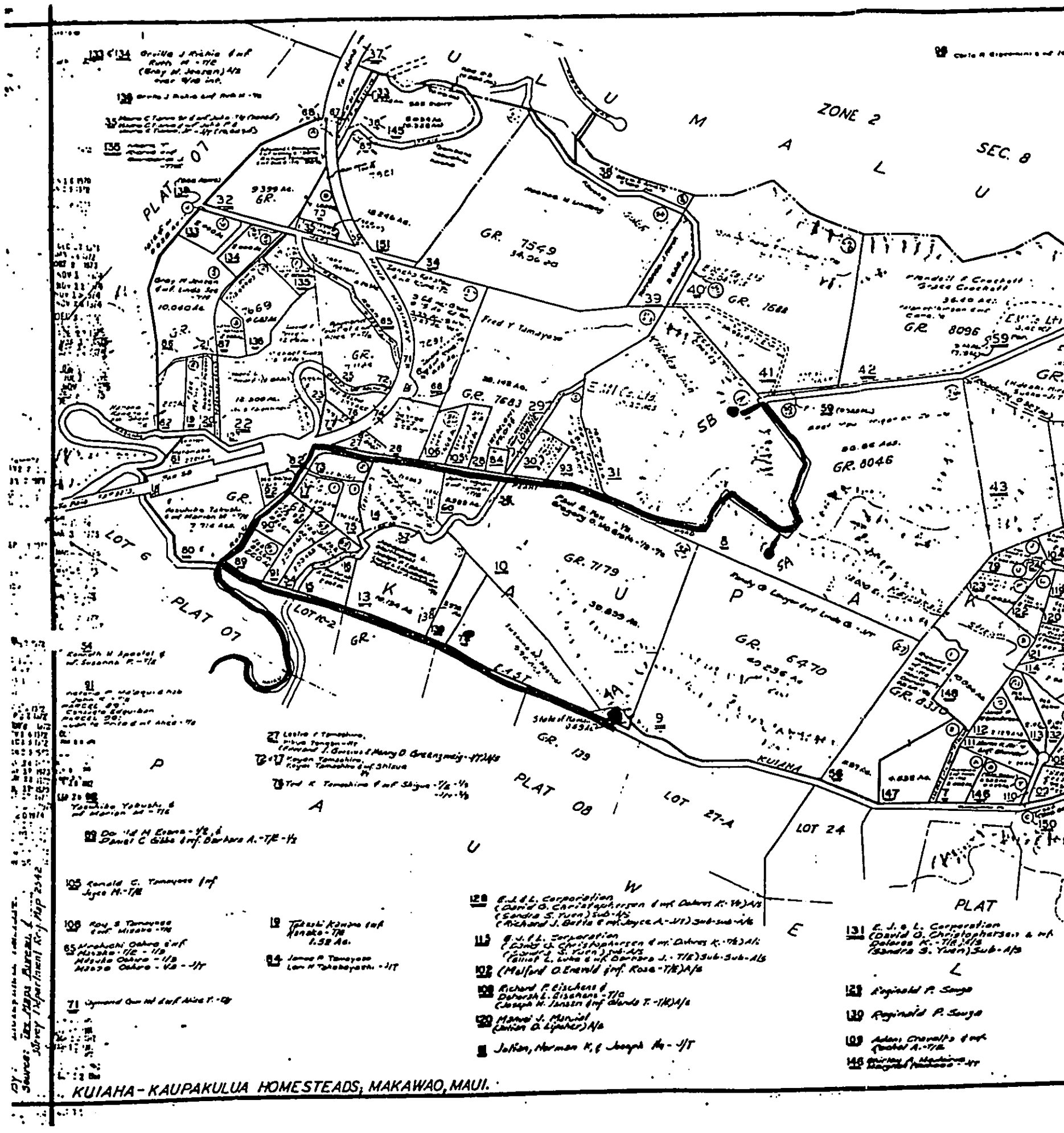
Plat 08
Plat 09
Plat 08
TO FOOT ROAD
MIDWAY GRANT
TO FOOT ROAD
LIHAU PLACE
Kong Choon Lee
43,822 sf
Hitoshi Yamashita
Julia Kukuia
Paunale Stream
Alexander & Baldwin, Inc.
Edward B. Santos & wf. Elaine K.
Haruto Tokata & wf. Lestrice
7.09 Acs.
N. KAPUAI
HAIKU
LOWRIE DITCH
SUBJECT TO CHANGE
Parcels Dropped: 13, 20, 74
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE
SEC.
PLAT
2
7
10
CONTAINING PARCELS
SCALE: 1 in. = 100 FT.



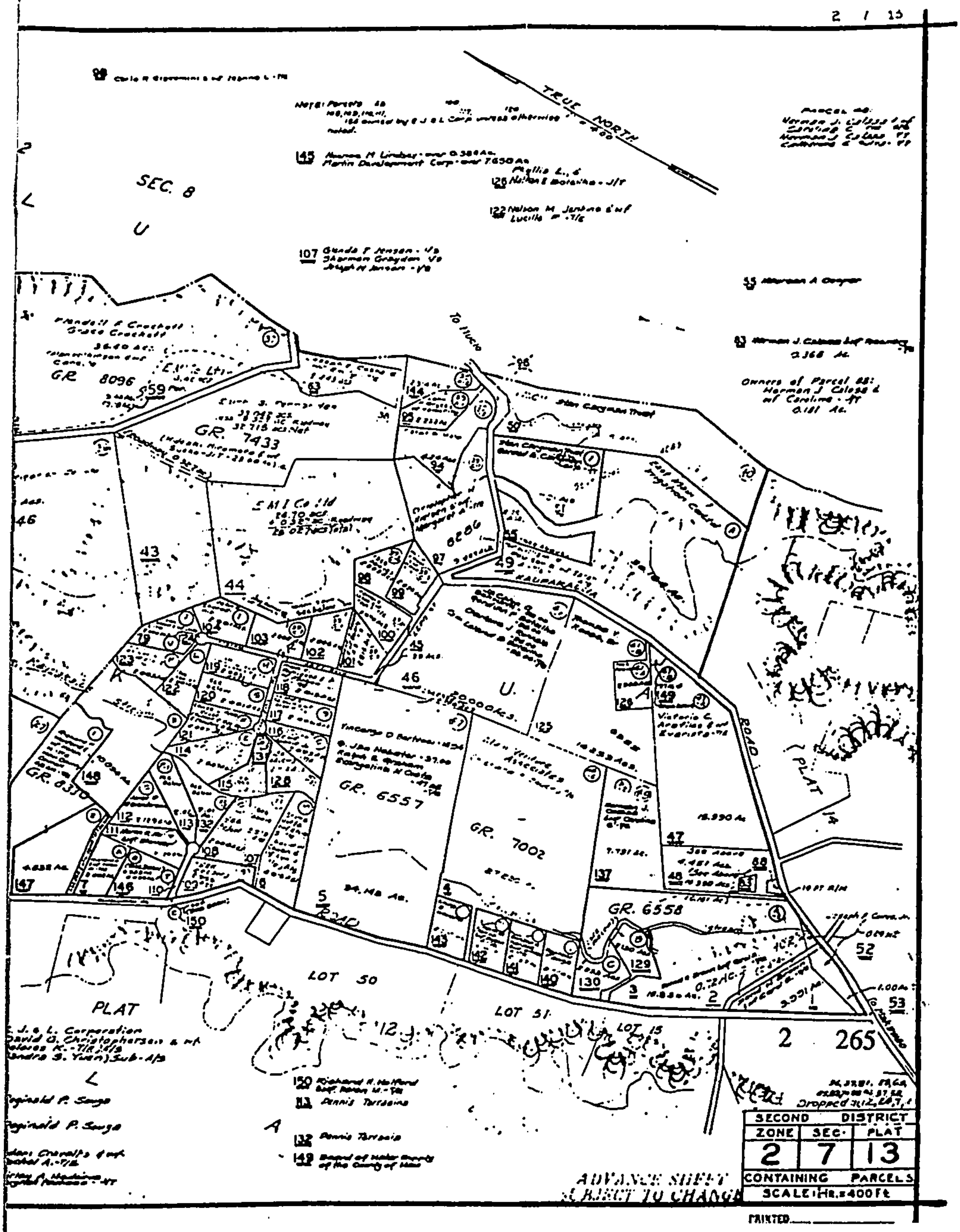
HAIKU, MAKAWAO, MAUI.
Source: Tax Maps Bureau L.J. Ct App. 181
HAIKU PINEAPPLE CANNERY
HAIKU ROAD
KOKOMO ROAD
LOWRIE DITCH
24 FOOT ROAD
AKOA PLACE
PLACE
CISTERN RESERVE
CAMP 4 Application Land
KAHEALANI STREET
IULANI STREET
Court
PLAT 16
PLAT 17
PLAT 18
PLAT 19
PLAT 20
PLAT 03
PLAT 05
PLAT 54
PLAT 16
To Puuomaki
Alexander & Baldwin, Inc.
Investment and Properties Group of Maui, Inc.
Land
Norman M. Matsushima
John Estes & wf Mary K.
East Maui Irrigation Co.
TRACT
PICO
HAIKU

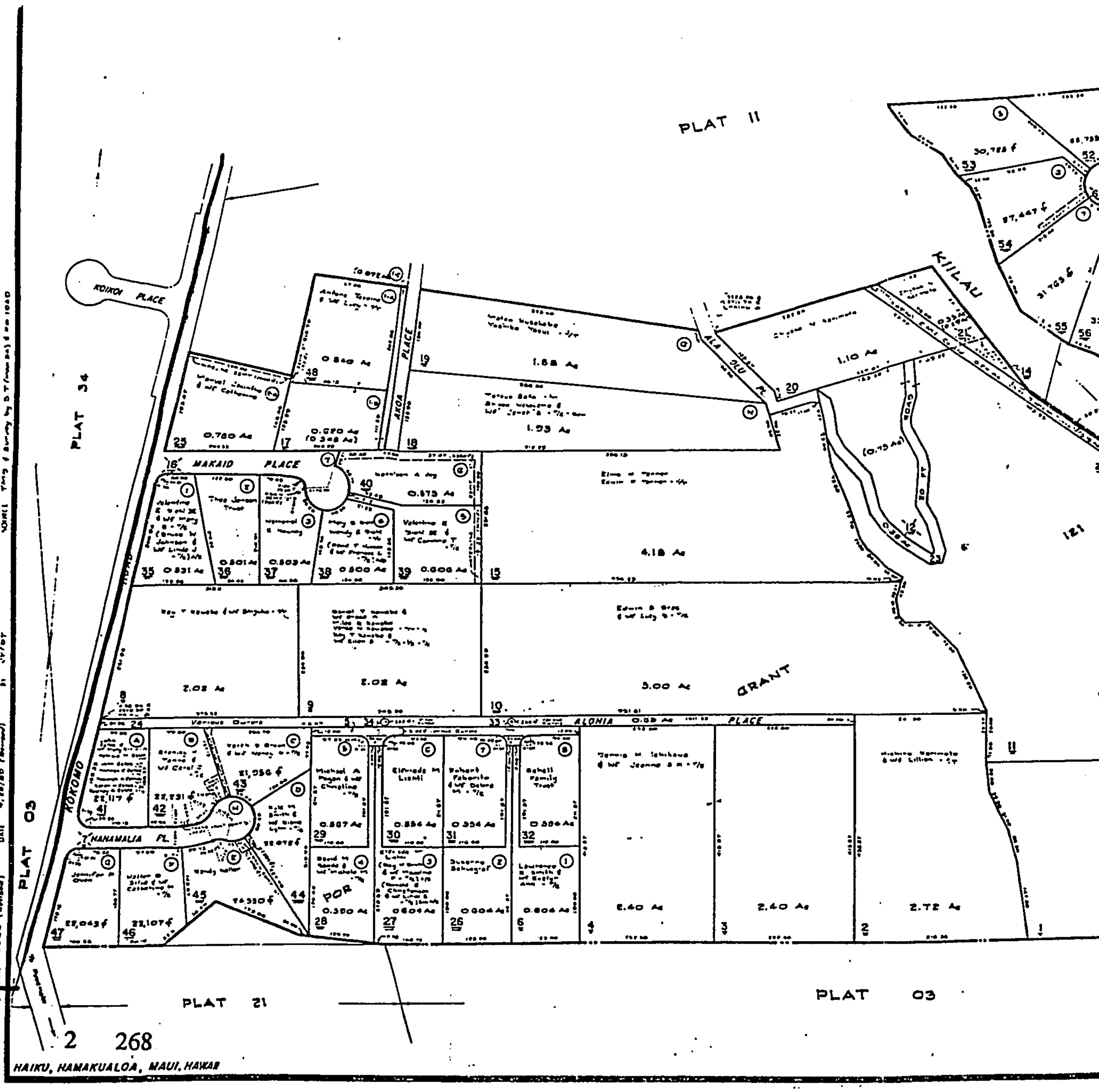


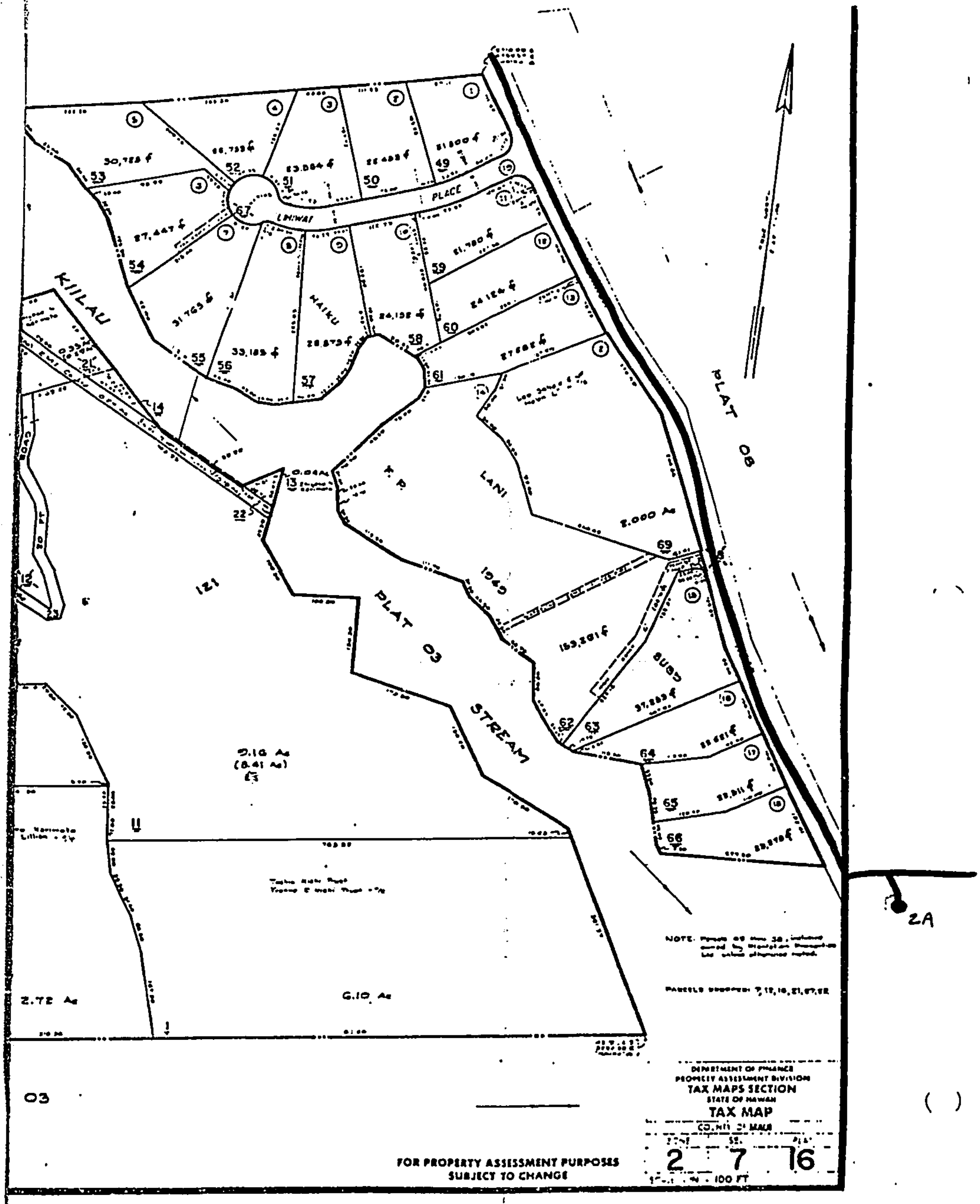
ROAD
161
STREET
Application
STREET
PLAT 10
East Maui Irrigation Co.
TRACT
KOHEA PLACE
161
Application
LOWRIE DITCH
Edward G. M. Tavares
Gr. 7434
SECTION 2
2.80 Acs.
40 FOOT ROAD (ABANDONED)
Investment and Properties Group of Maui, Inc.
County
Land
HAIKU LANI SUBD
F. P. 1040
LIHIWAI PLACE
Edward R. Ferreira & Wf. Virginia
Myrick W. Giffey
CHANDLER DITCH
PLAT 08
PLAT 16
PLAT 05
2
263
Dropped
SECOND DIVISION
ZONE 2
SEC. 7
PLAT 11
CONTAINING PARCELS
SCALE 1in.= 100 ft.
PRINTED

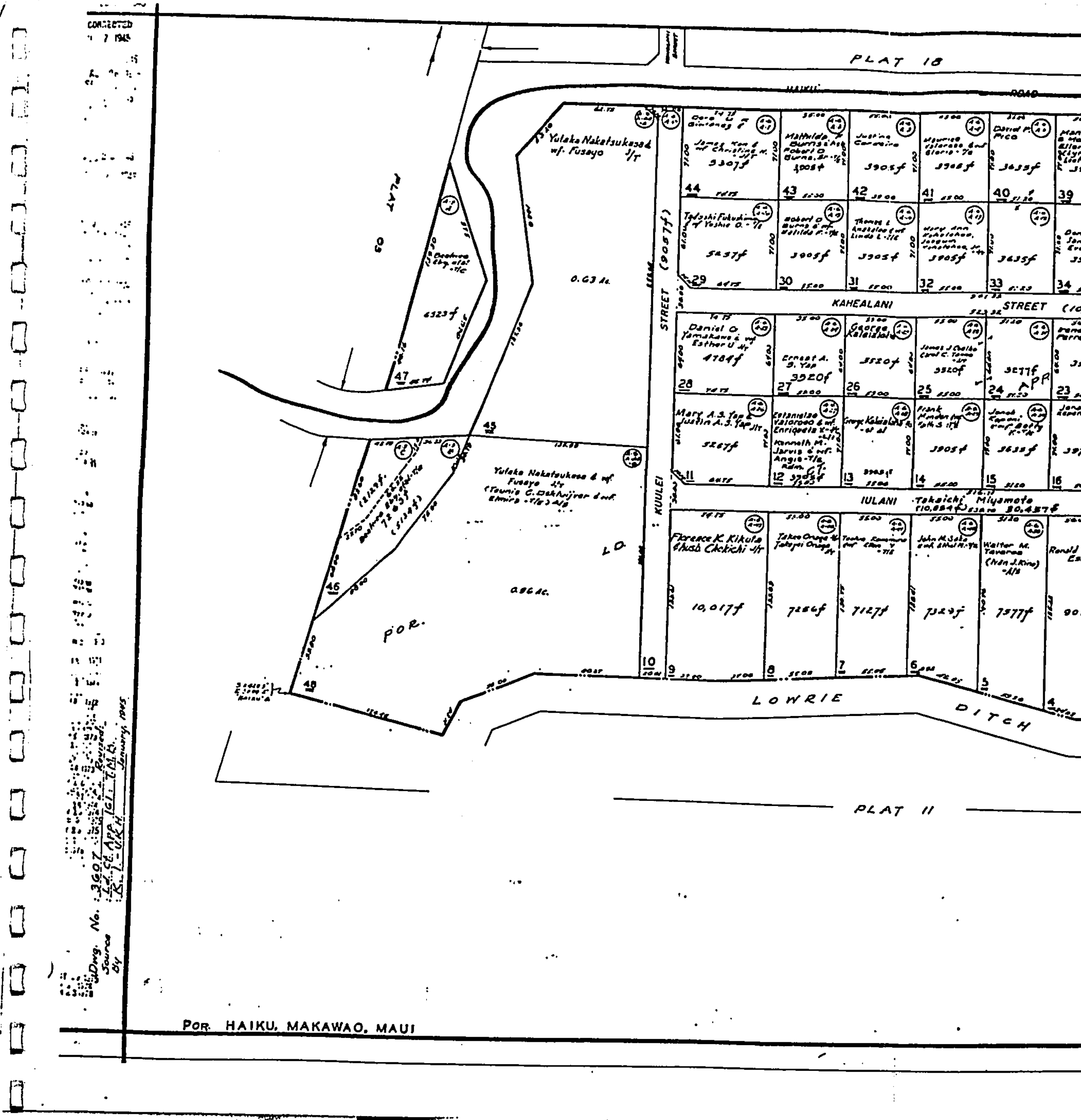


KUIAHA - KAUPAKULUA HOMESTEADS, MAKAWAO, MAUI.

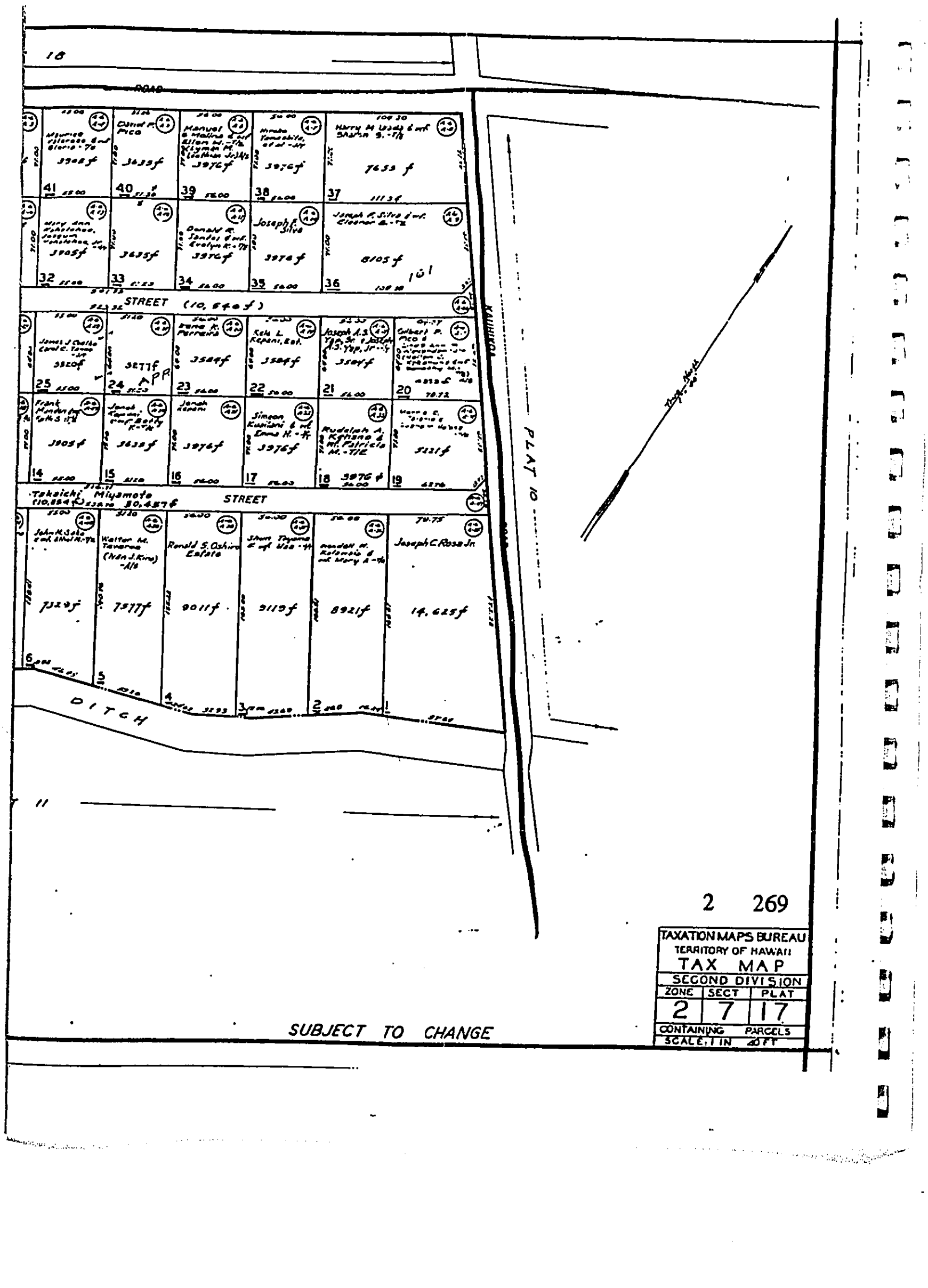

2 / 15
TRUE NORTH
SEC. 8
GR 8096
GR. 7433
GR. 6557
GR. 7002
GR. 6558
LOT 50
LOT 51
PLAT
2 265
ADVANCE SHEET
SUBJECT TO CHANGE
SECOND DISTRICT
ZONE SEC. PLAT
2 7 13
CONTAINING PARCELS
SCALE: 1 In. = 400 Ft.
PRINTED


PLAT 11
PLAT 34
PLAT 03
PLAT 21
PLAT 03
KOIKOI PLACE
MAKAIO PLACE
AKOA PLACE
ALA IOLU PL.
KIILAU
KOKOMO
HANAMALIA PL.
ALOHIA PLACE
GRANT
POR
2 268
HAIKU, HAMAKUALOA, MAUI, HAWAII


KIILAU
HAIKU
PLACE
LANI
PLAT 08
PLAT 03
STREAM
2A
03
2.72 Ac
6.10 Ac
2.000 Ac
DEPARTMENT OF FINANCE
TAX MAPS SECTION
STATE OF HAWAII
TAX MAP
2 7 16
FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE



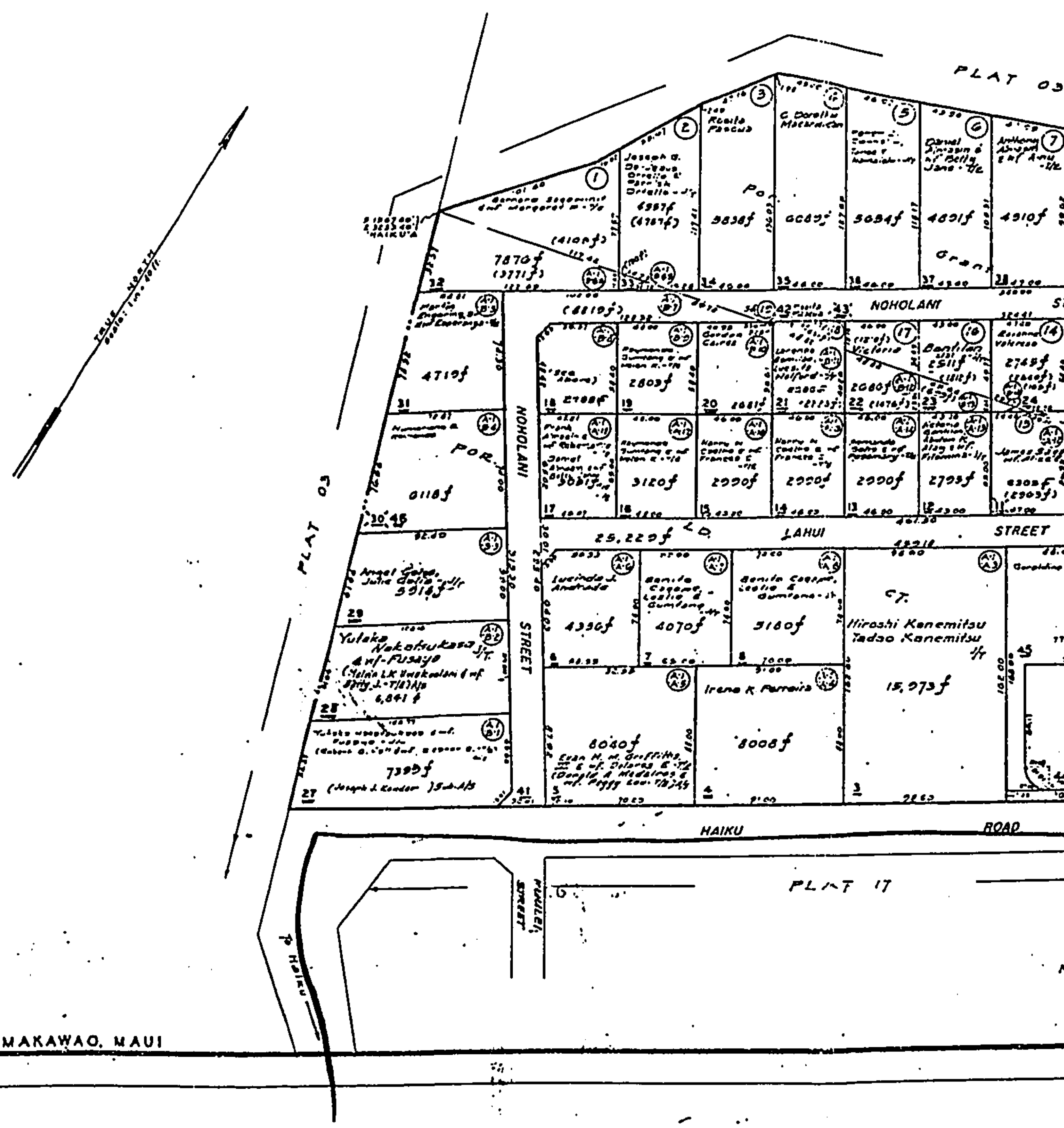
PLAT 18
HAIKU ROAD
PLAT 03
PLAT 11
KAHEALANI STREET
IULANI
KUULEI STREET (9057f)
LOWRIE DITCH
Yutaka Nakatsukasa & wf. Fusayo J/T
0.63 Ac.
0.86 Ac.
POR.
Daniel O. Yamakawa & wf. Esther U. J/T
Ernest A. S. Yap
George Kalaialala
Mary A. S. Yap & Justin A. S. Yap J/T
Florence K. Kikuta & Husb. Ckekichi J/T
Takaichi Miyamoto
Walter M. Tavares
Tadashi Fukuda & wf. Yoshie O. - T/E
Justina Carvalho
Por. HAIKU, MAKAWAO, MAUI
Drg. No. 3607
Source
By
CORRECTED



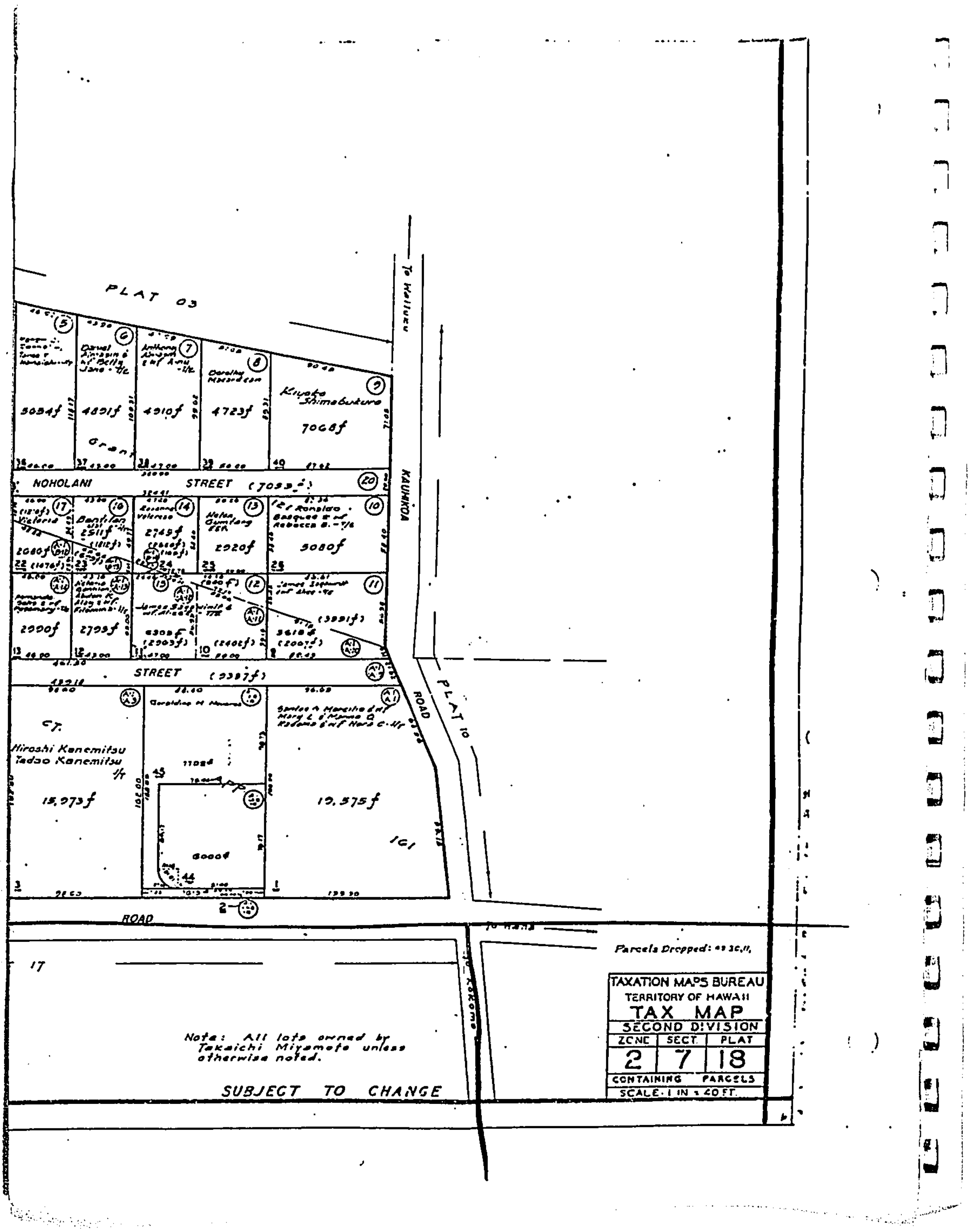
2 269

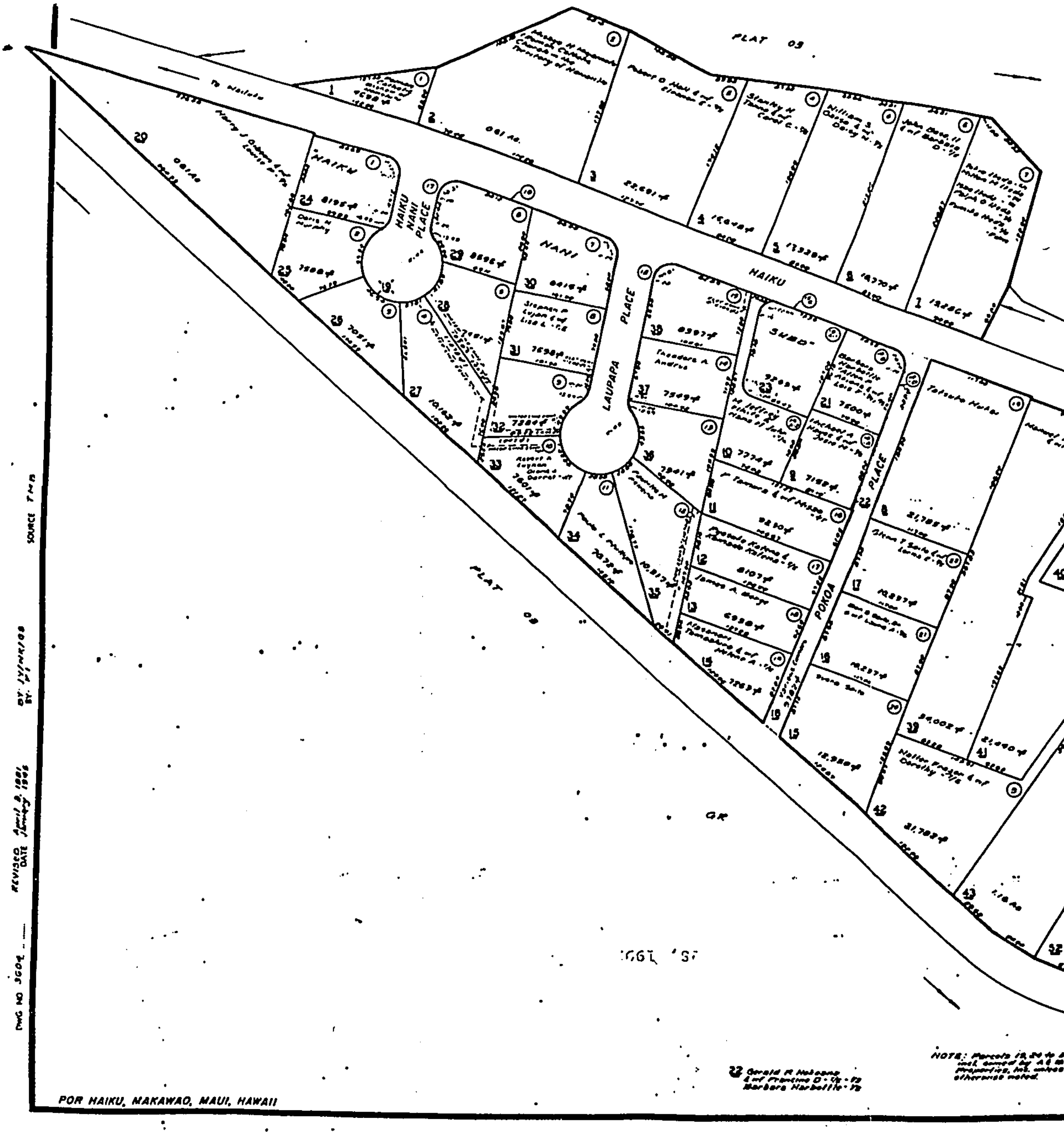
TAXATION MAPS BUREAU		
TERRITORY OF HAWAII		
TAX MAP		
SECOND DIVISION		
ZONE	SECT	PLAT
2	7	17
CONTAINING PARCELS		
SCALE, 1 IN 20 FT		

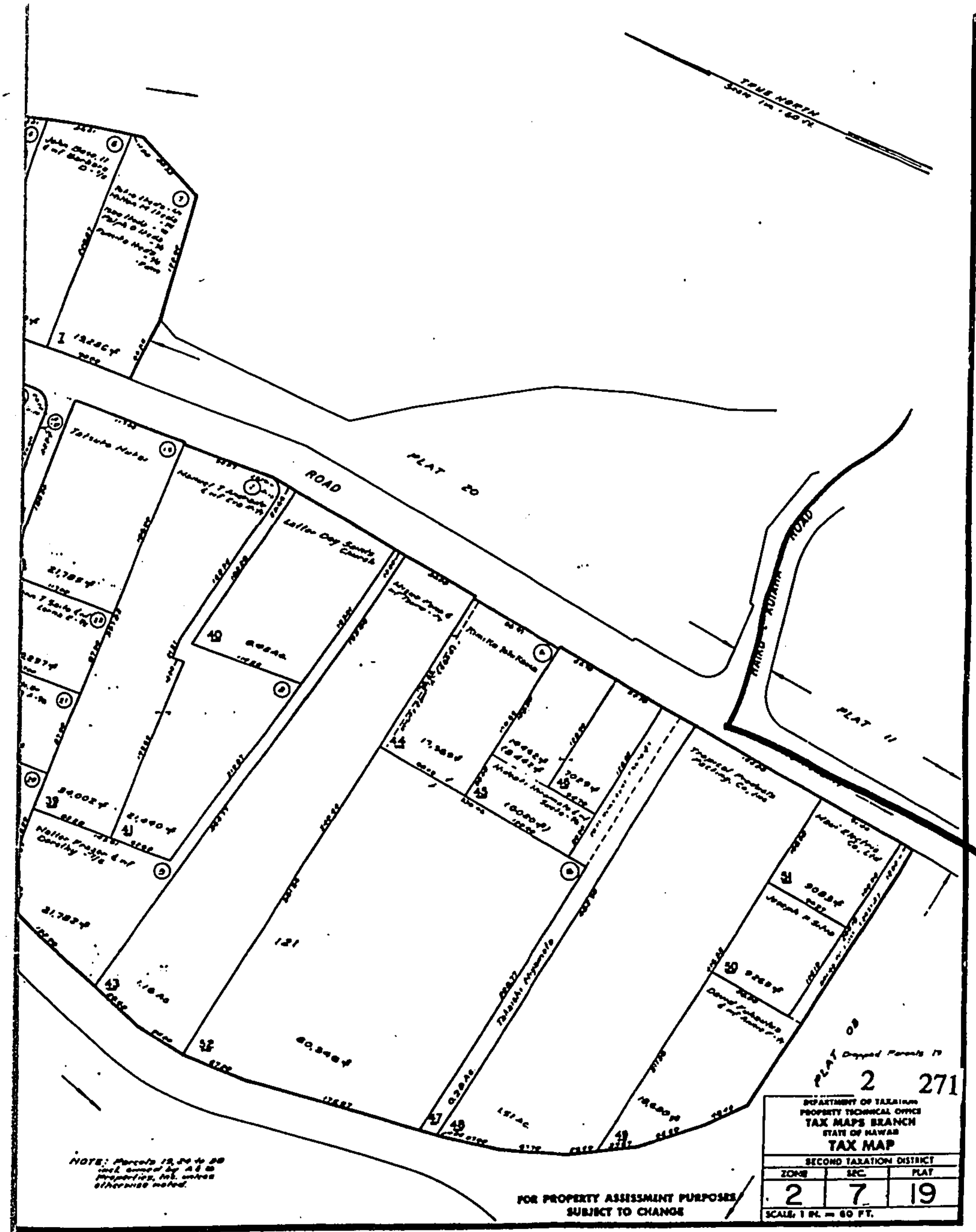
Dwg. No. 3603
Source Ld. Ct. App. 1611, T.M.B.
By K.I.
Revised: January, 1945

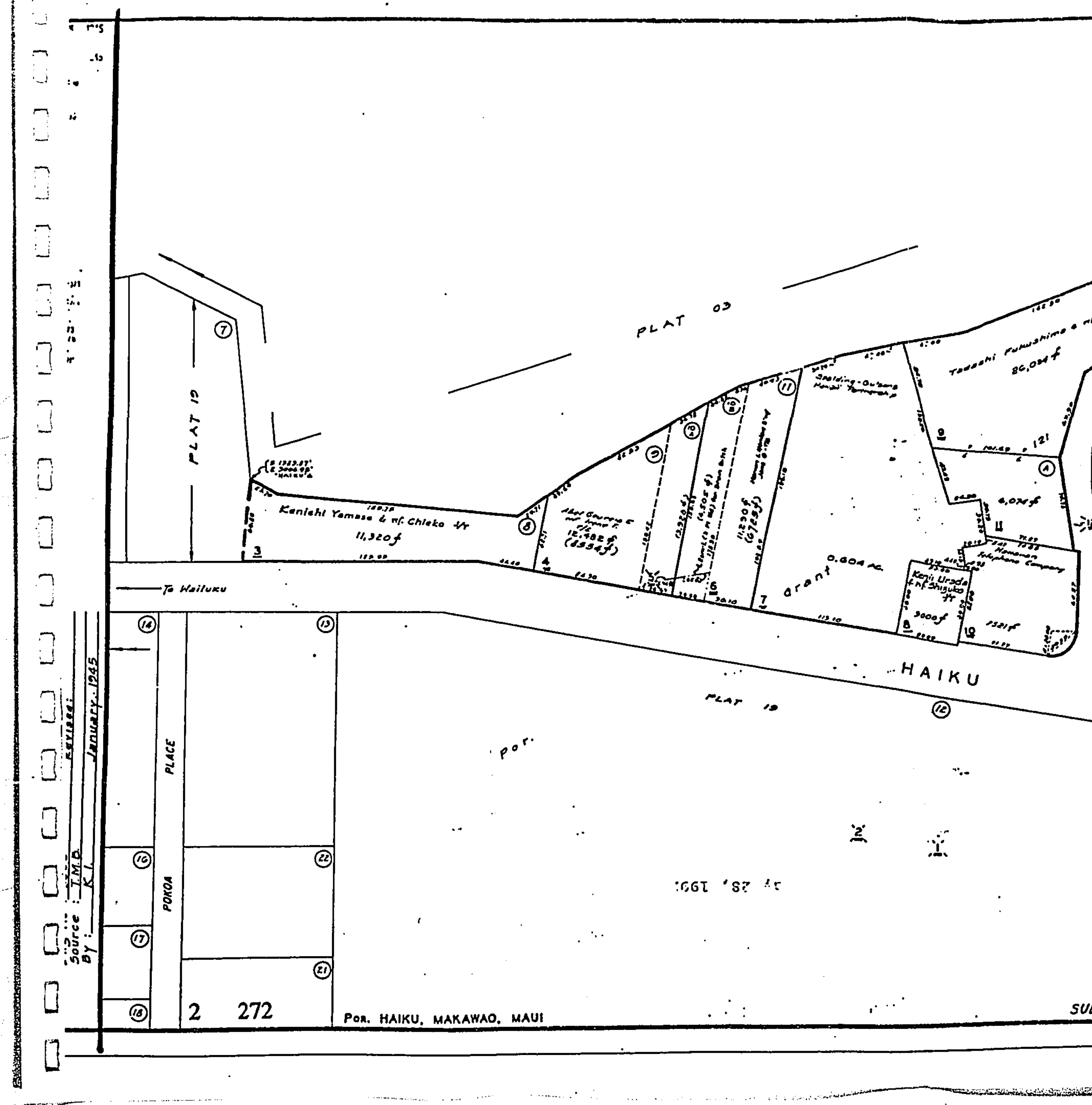


2 270
Por. HAIKU, MAKAWAO, MAUI

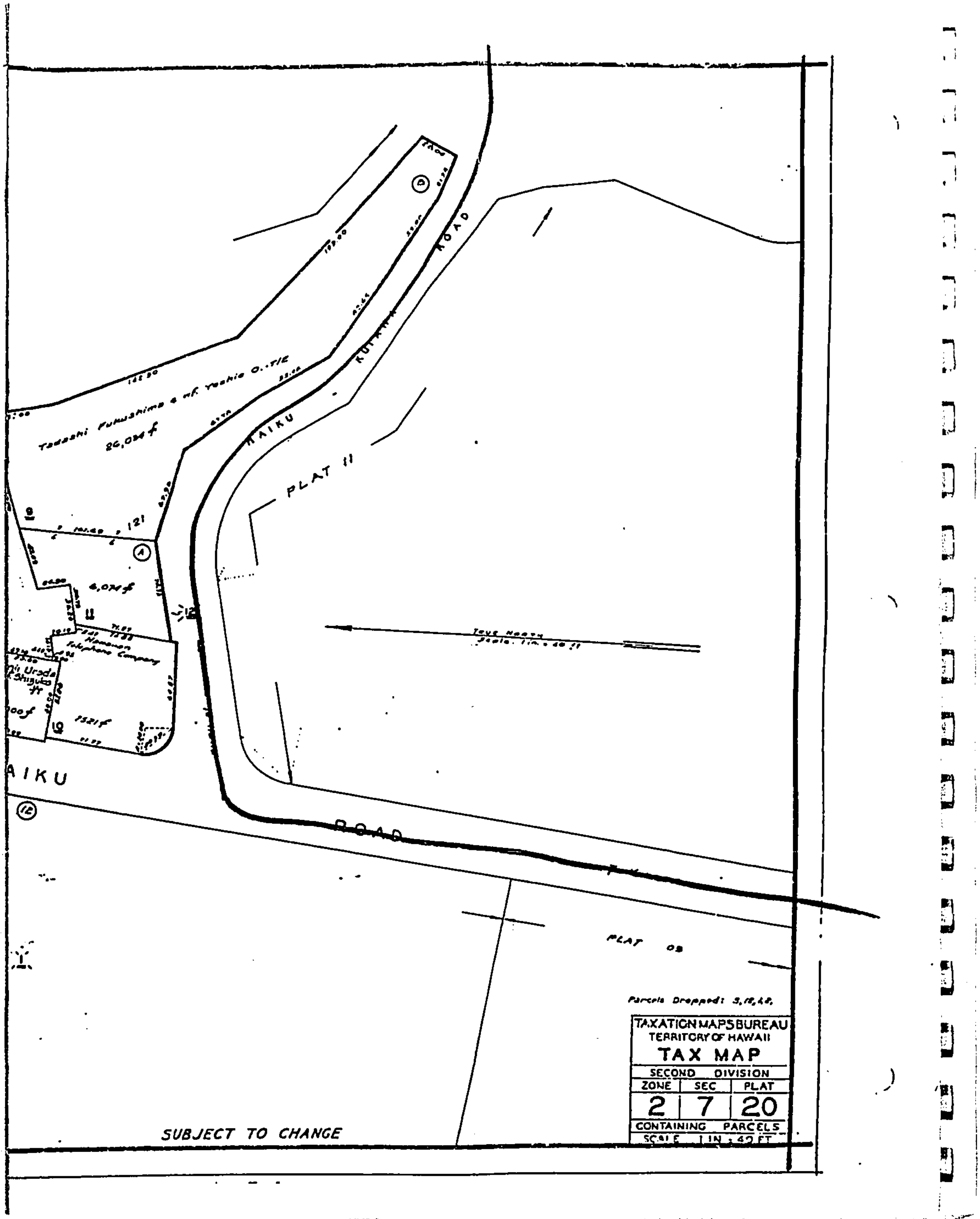

PLAT 03
Kiyoko Shimabukuro
7068f
5054f
4891f
4910f
4723f
NOHOLANI STREET
KAUIKOA
To Wailuku
2920f
5080f
2743f
2511f
2080f
2990f
2793f
STREET
ROAD
PLAT 10
Hiroshi Kanemitsu
Tadao Kanemitsu
15,973f
19,575f
ROAD
To Kokomo
Parcels Dropped:
Note: All lots owned by Takaichi Miyamoto unless otherwise noted.
SUBJECT TO CHANGE
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE
SECT.
PLAT
2
7
18
CONTAINING
PARCELS
SCALE: 1 IN = 40 FT.

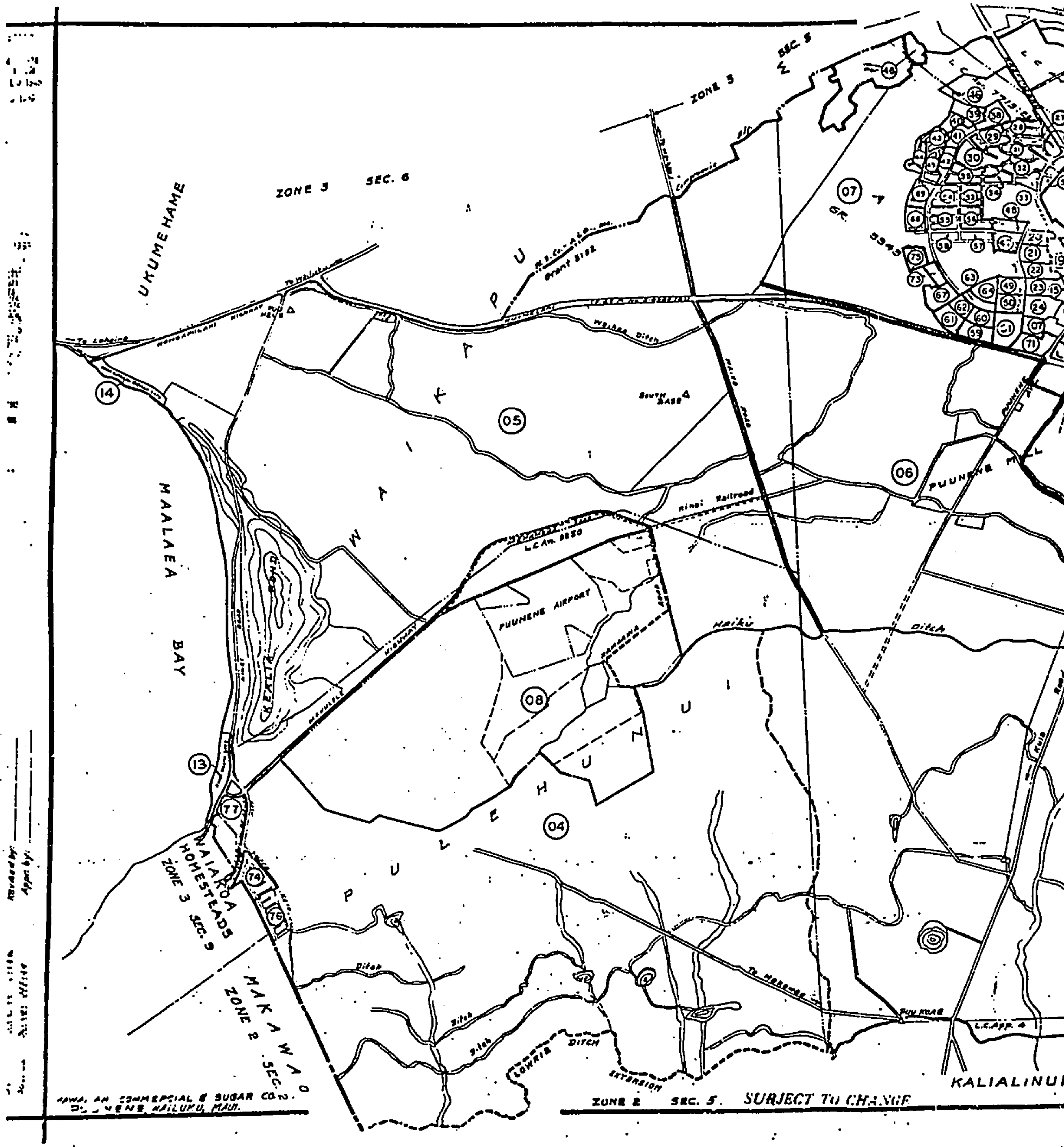

PLAT 03
To Wailuku
HAIKU NANI PLACE
NANI
LAUPAPA PLACE
HAIKU
POKOA PLACE
PLAT 03
POR HAIKU, MAKAWAO, MAUI, HAWAII

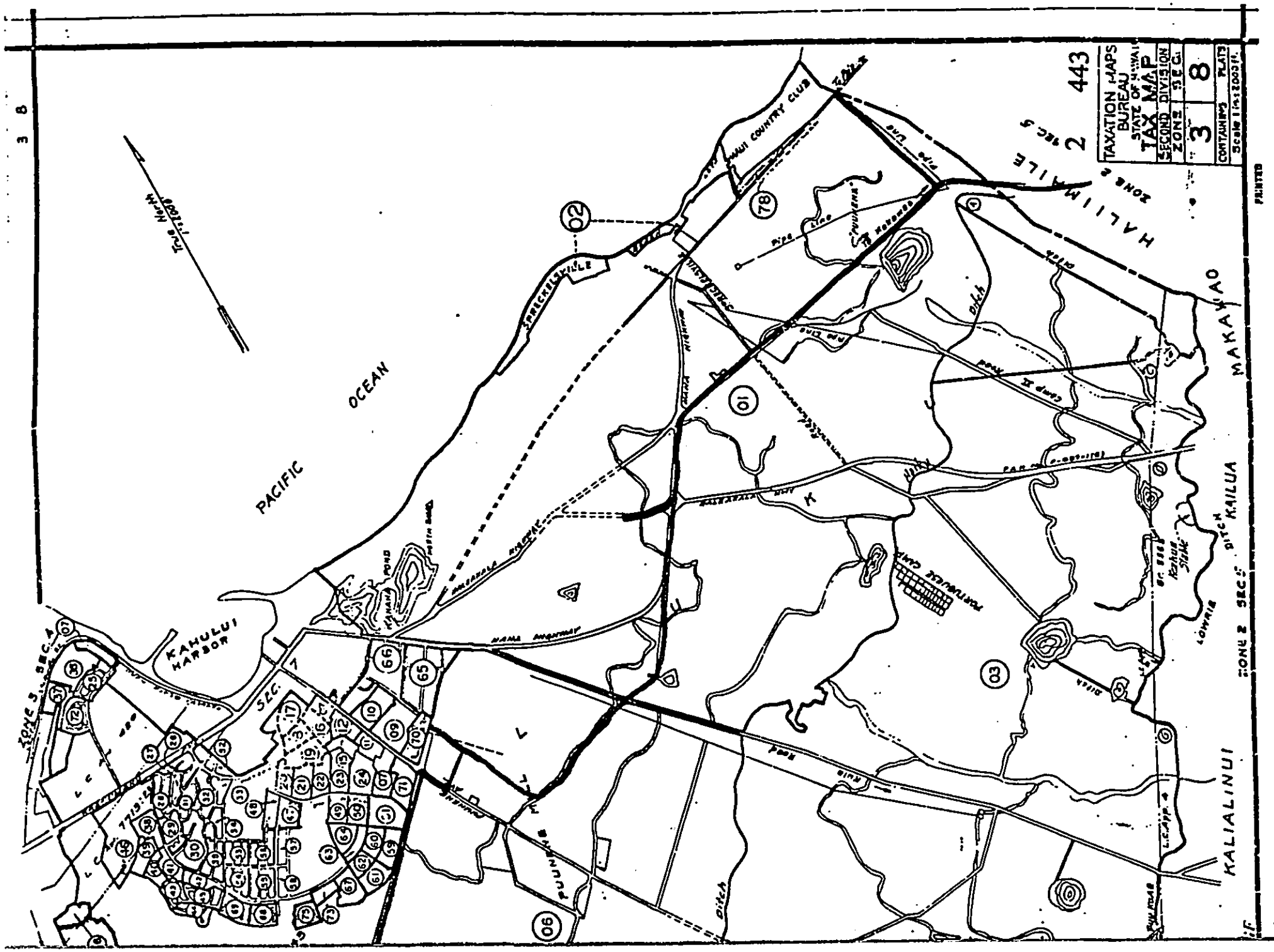

TRUE NORTH
ROAD
PLAT 20
PLAT 11
Latter Day Saints Church
Tropical Products Packing Co., Inc
Maui Electric Co. Ltd
121
NOTE: Parcels 19, 24 to 28 incl. owned by A & B Properties, Inc. unless otherwise noted.
FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE
2 271
DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP
SECOND TAXATION DISTRICT
ZONE
SEC.
PLAT
2
7
19
SCALE: 1 IN. = 60 FT.



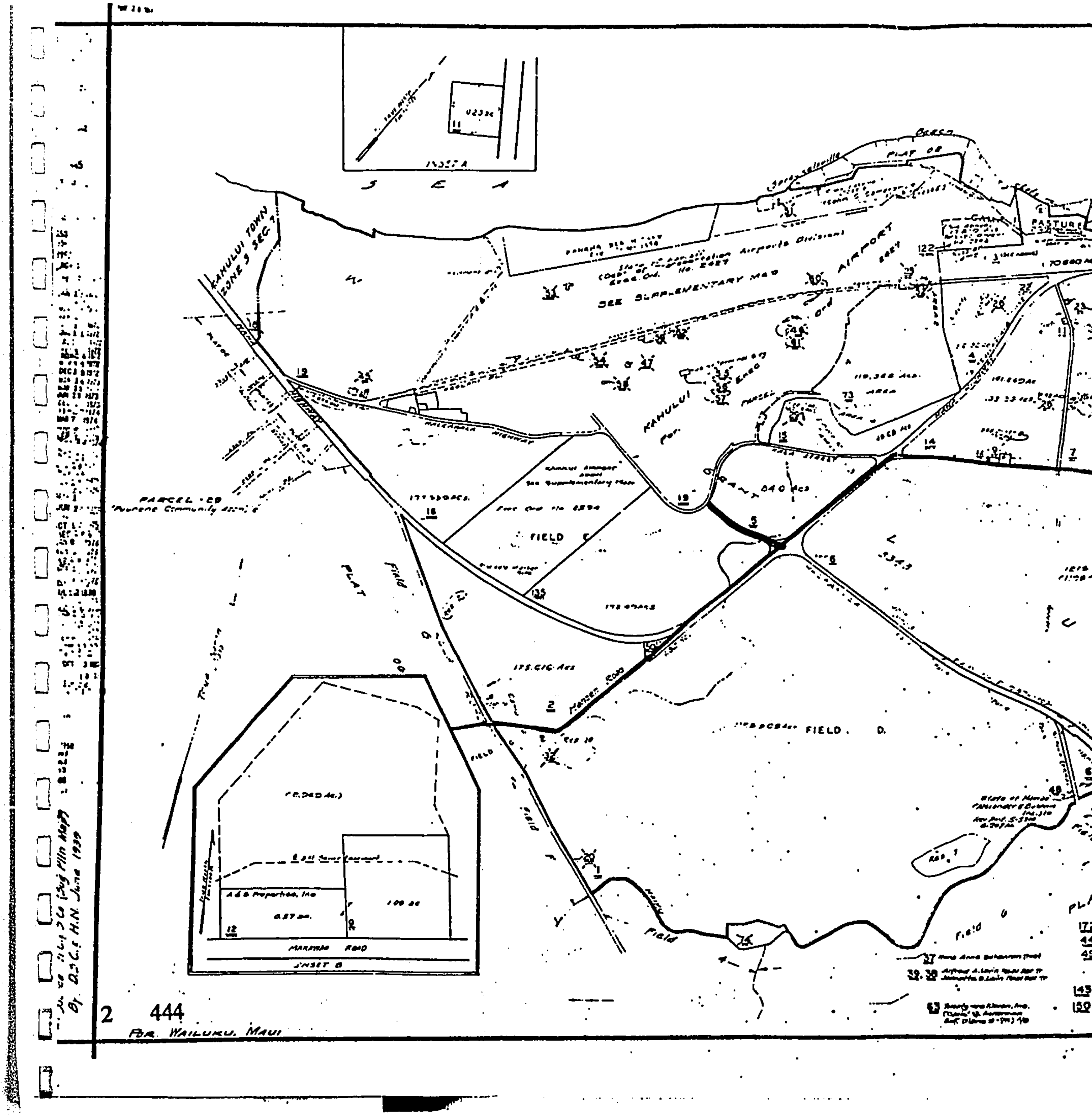
PLAT 03
PLAT 19
Kenichi Yamase & w/. Chieko 1/2
11,320 sf
Tadashi Fukushima
86,034 sf
Spalding-Gubang
To Wailuku
HAIKU
PLAT 19
grant
0.604 Ac.
Kenji Urada & w/. Shizuko
3000 sf
Hamakua Telephone Company
6,074 sf
POKOA
PLACE
por.
Revised:
January 1945
Source: T.M.D.
By: K.I.
2 272
POR. HAIKU, MAKAWAO, MAUI


PLAT 11
AIKU
ROAD
PLAT 03
SUBJECT TO CHANGE
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE SEC PLAT
2 7 20
CONTAINING PARCELS

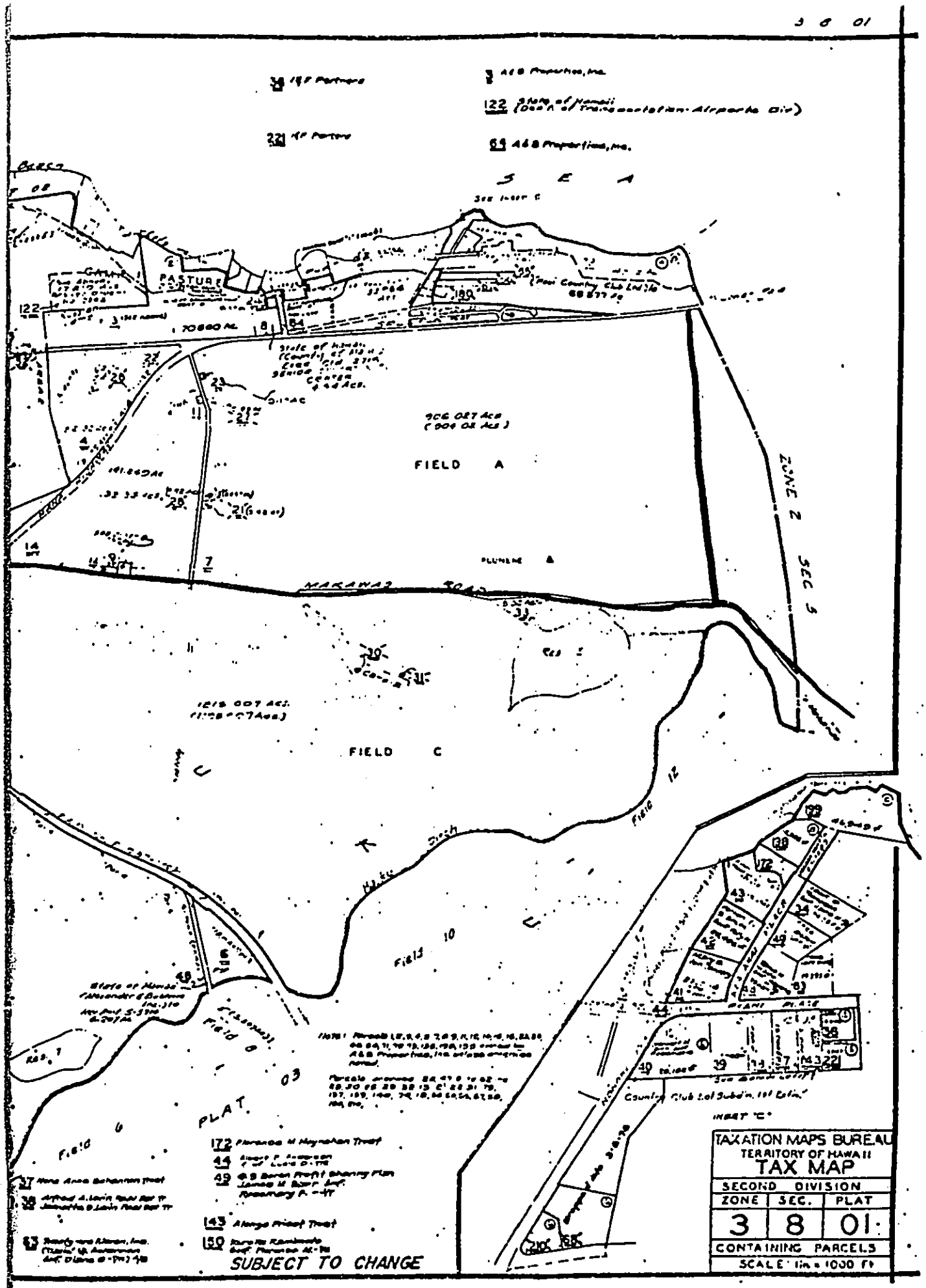

ZONE 3 SEC. 6
UKUMEHAME
ZONE 3
SEC. 5
WAIKAPU
MAALAEA BAY
KEALIA POND
PUUNENE AIRPORT
PULEHUNUI
PUUNENE MILL
Haiku Ditch
Kihei Railroad
WAIAKOA HOMESTEADS ZONE 3 SEC. 9
MAKAWAO ZONE 2 SEC. 2
LOWRIE DITCH EXTENSION
To Lahaina
To Makena
KALIALINUI
ZONE 2 SEC. 5.
SUBJECT TO CHANGE
05
06
07
08
04
13
14
77
74
75

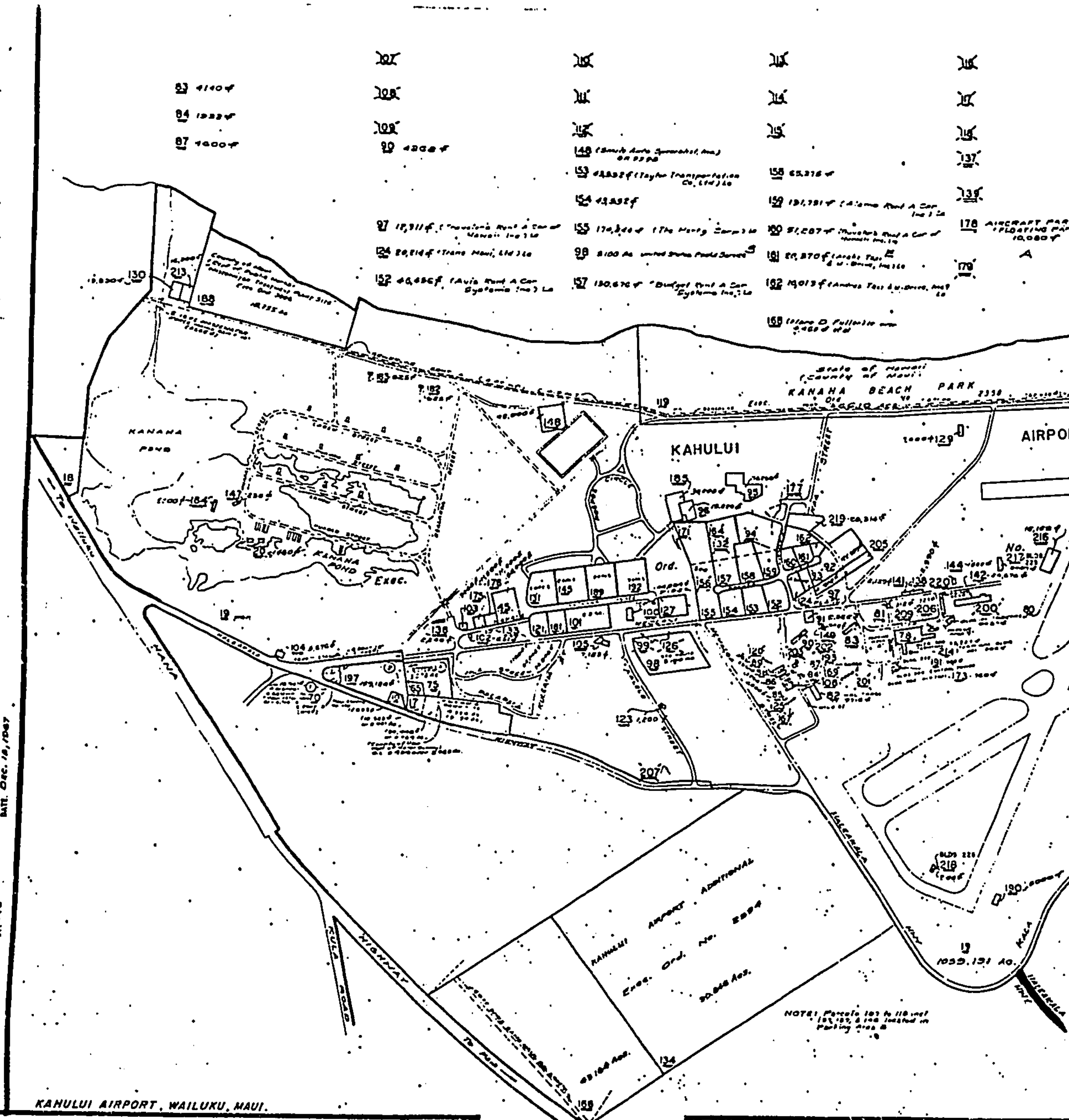


3 8
ZONE 3 SEC. 4
KAHULUI HARBOR
True North
PACIFIC OCEAN
SEC. 7
KANAHA POND
PUUNENE MILL
HANA HIGHWAY
SPRECKELSVILLE
MAUI COUNTRY CLUB
PUUNENE
Pipe Line
Ditch
PORTUGUESE CAMP
Camp II Road
Kahua Stable
LOWRIE DITCH
KALIALINUI
ZONE 2 SEC. 5
KAILUA
MAKAWAO
HALIIMAILE
ZONE 2 SEC. 5
2 443
TAXATION MAPS BUREAU
STATE OF HAWAII
TAX MAP
SECOND DIVISION
ZONE 3
SEC. 8
CONTAINING PLATS
Scale 1 in. = 2000 ft.
01
02
03
06
65
66
78
PRINTED


INSET A
S E A
KAHULUI TOWN ZONE 3 SEC. 7
SEE SUPPLEMENTARY MAP
AIRPORT
KAHULUI
PASTURE
PARCEL 29
FIELD C
FIELD D
PLAT
Hansen Road
A & B Properties, Inc
MAKAWAO ROAD
INSET B
2 444
FOR. WAILUKU, MAUI

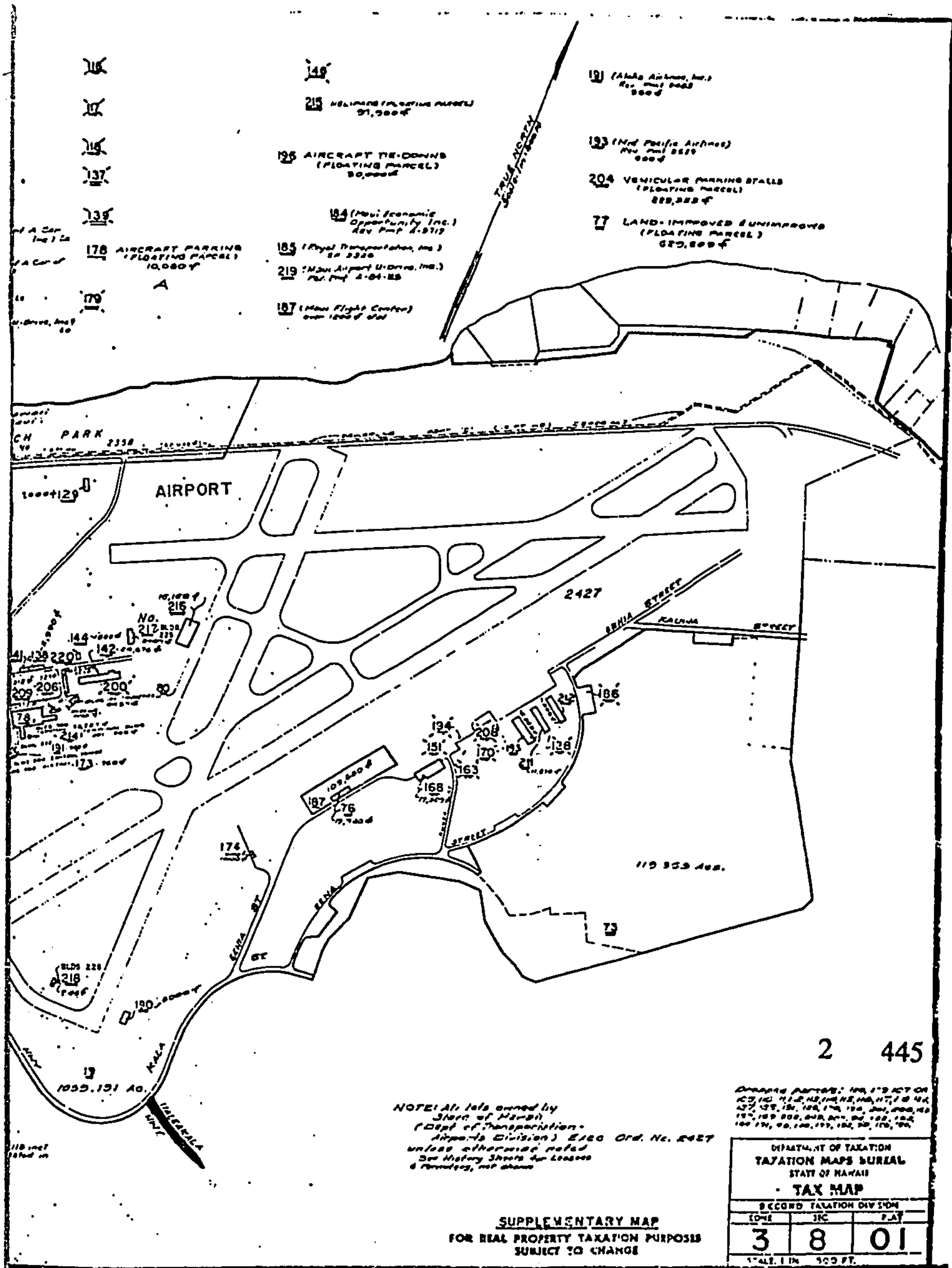
3 8 01


SEA
PASTURE
FIELD A
FIELD C
FIELD 10
FIELD 6
MAKAWAO
ZONE 2 SEC 5
SUBJECT TO CHANGE
INSET "C"
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DIVISION
ZONE | SEC. | PLAT
3 | 8 | 01
CONTAINING PARCELS
SCALE 1in = 1000 Ft

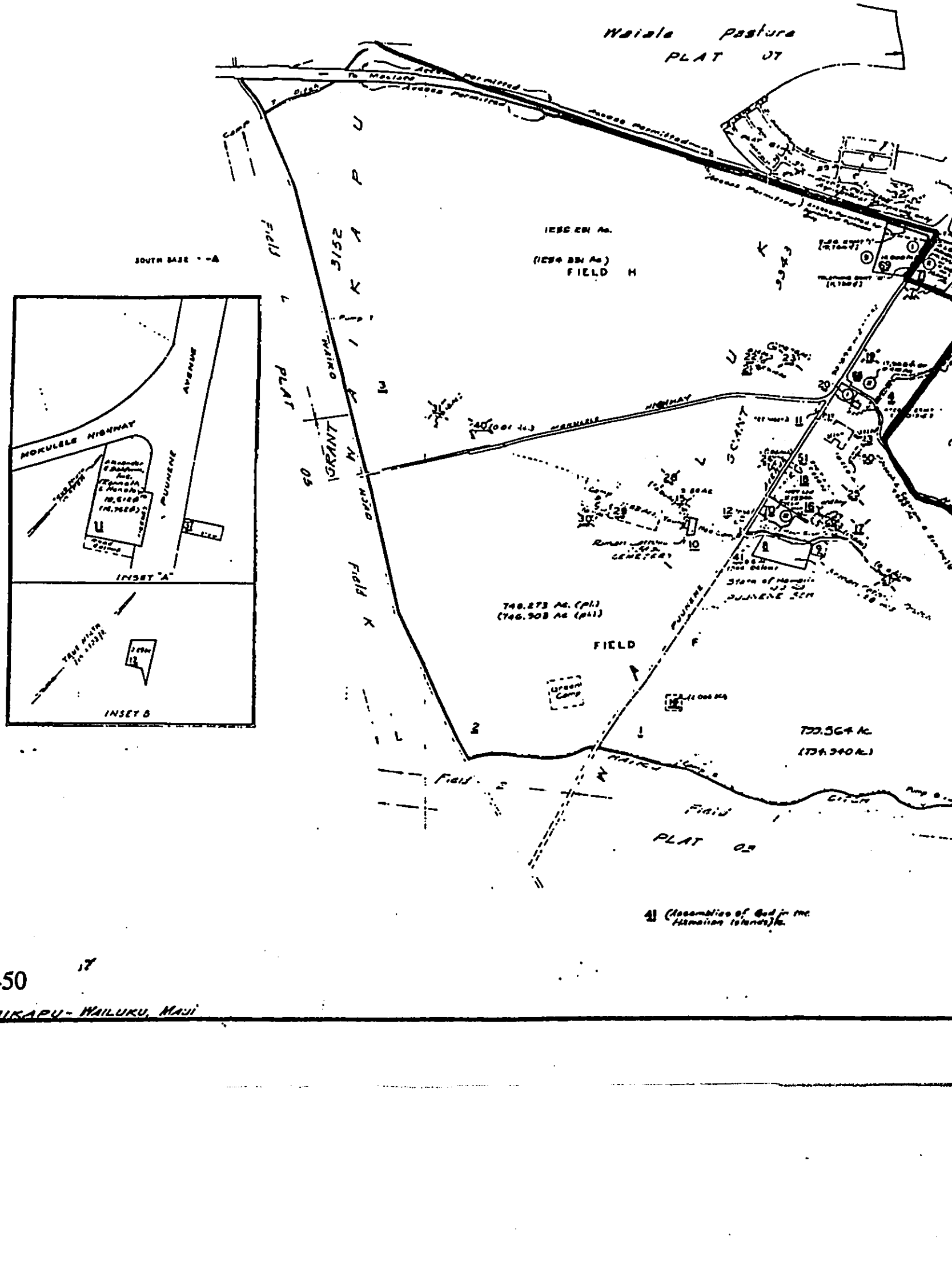


KAHULUI AIRPORT, WAILUKU, MAUI.

SOURCE: DEPT. of TRANSPORTATION-AIRPORTS DIVISION.
BY: KU DATE: DEC. 18, 1967

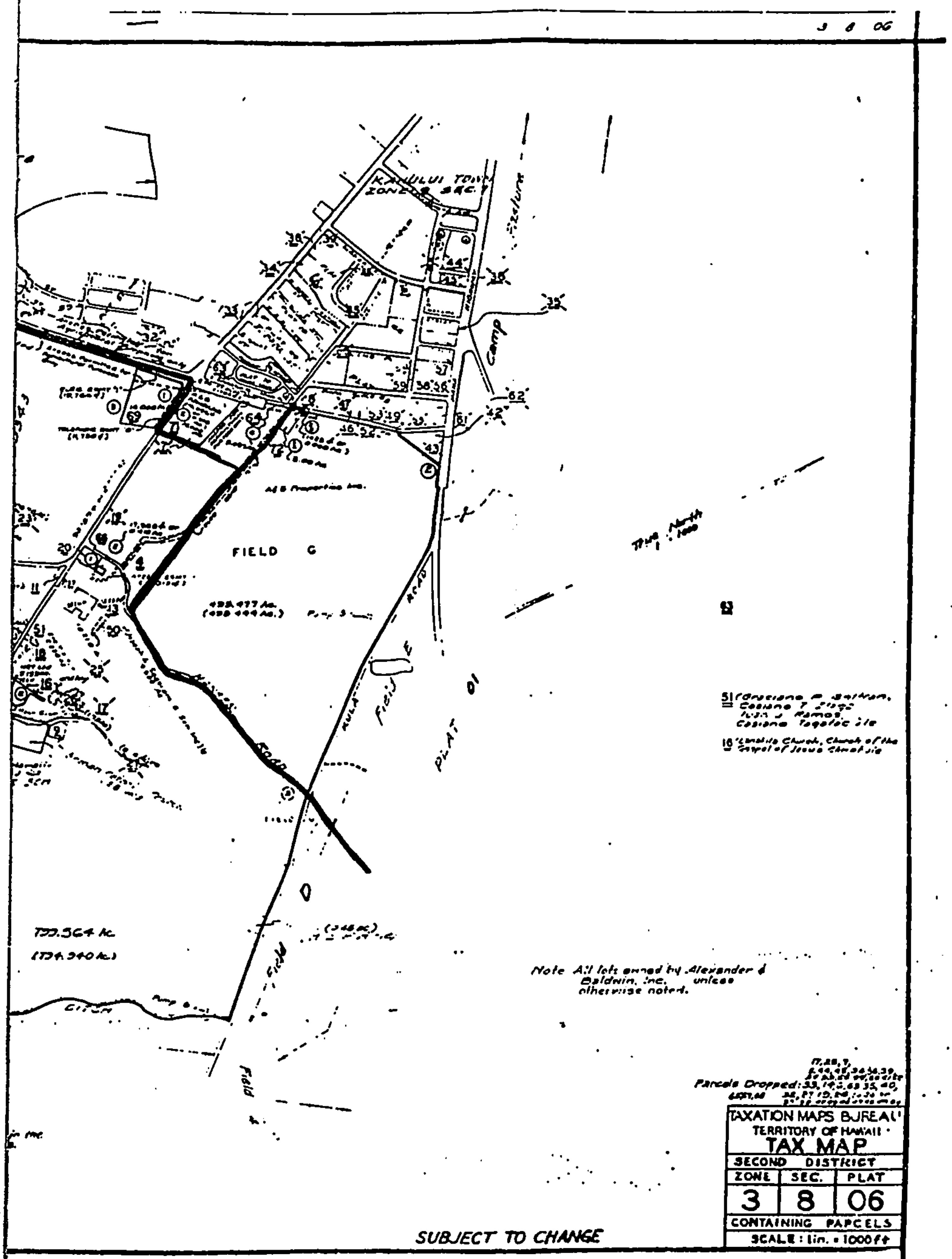


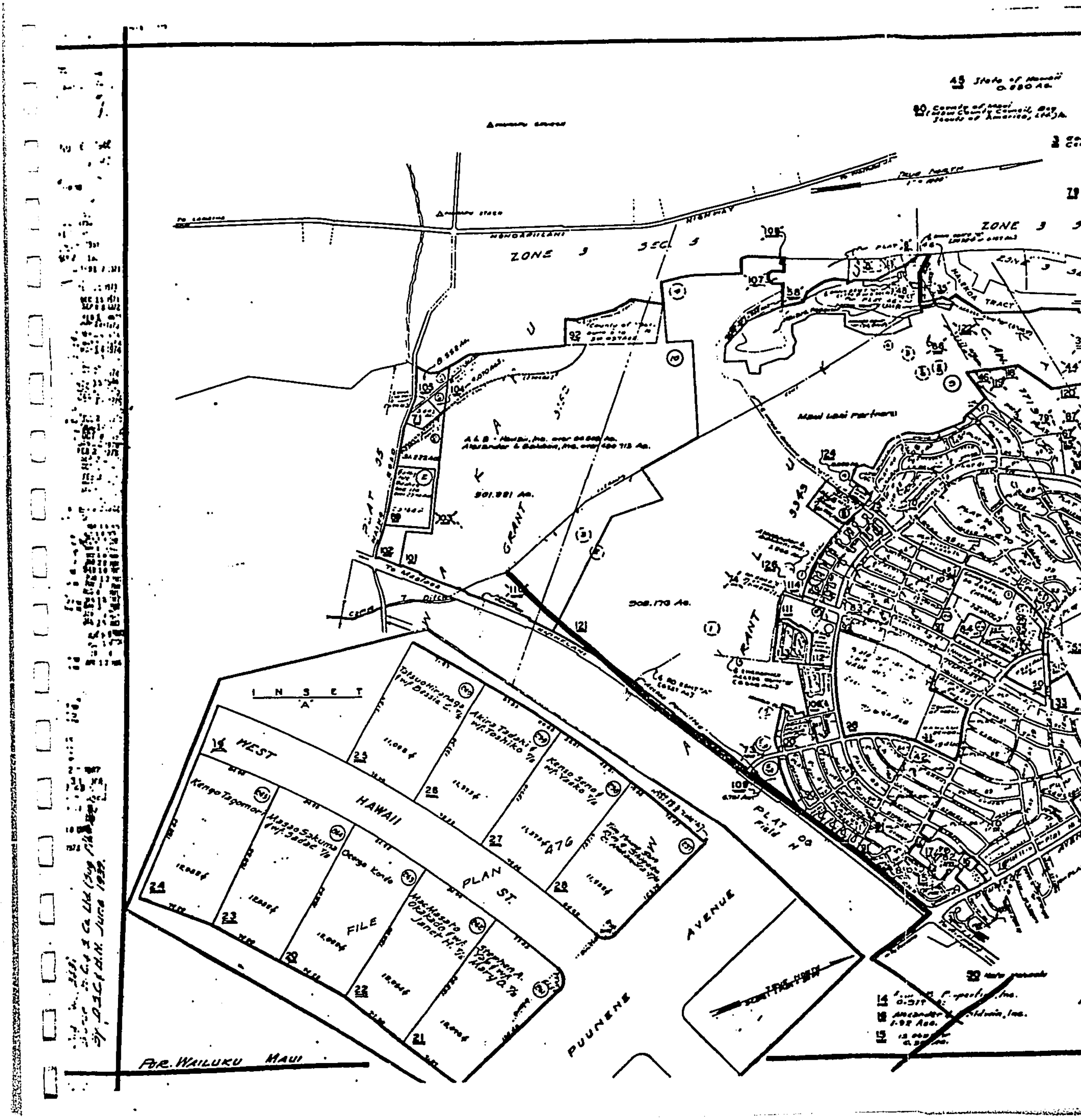
215 HELIPADS (FLOATING PARCEL) 91,500 sf
196 AIRCRAFT TIE-DOWNS (FLOATING PARCEL) 30,000 sf
178 AIRCRAFT PARKING (FLOATING PARCEL) 10,080 sf
204 VEHICULAR PARKING STALLS (FLOATING PARCEL) 228,283 sf
77 LAND - IMPROVED & UNIMPROVED (FLOATING PARCEL) 625,509 sf
AIRPORT
PARK
2427
KALUA STREET
EENA ST
HANA
119.353 Acs.
1059.131 Ac.
2 445
NOTE: All lots owned by State of Hawaii (Dept of Transportation - Airports Division) Exec. Ord. No. 2427 unless otherwise noted
DEPARTMENT OF TAXATION
TAXATION MAPS BUREAU
STATE OF HAWAII
TAX MAP
SECOND TAXATION DIVISION
ZONE 3
SEC 8
PLAT 01
SUPPLEMENTARY MAP
FOR REAL PROPERTY TAXATION PURPOSES
SUBJECT TO CHANGE



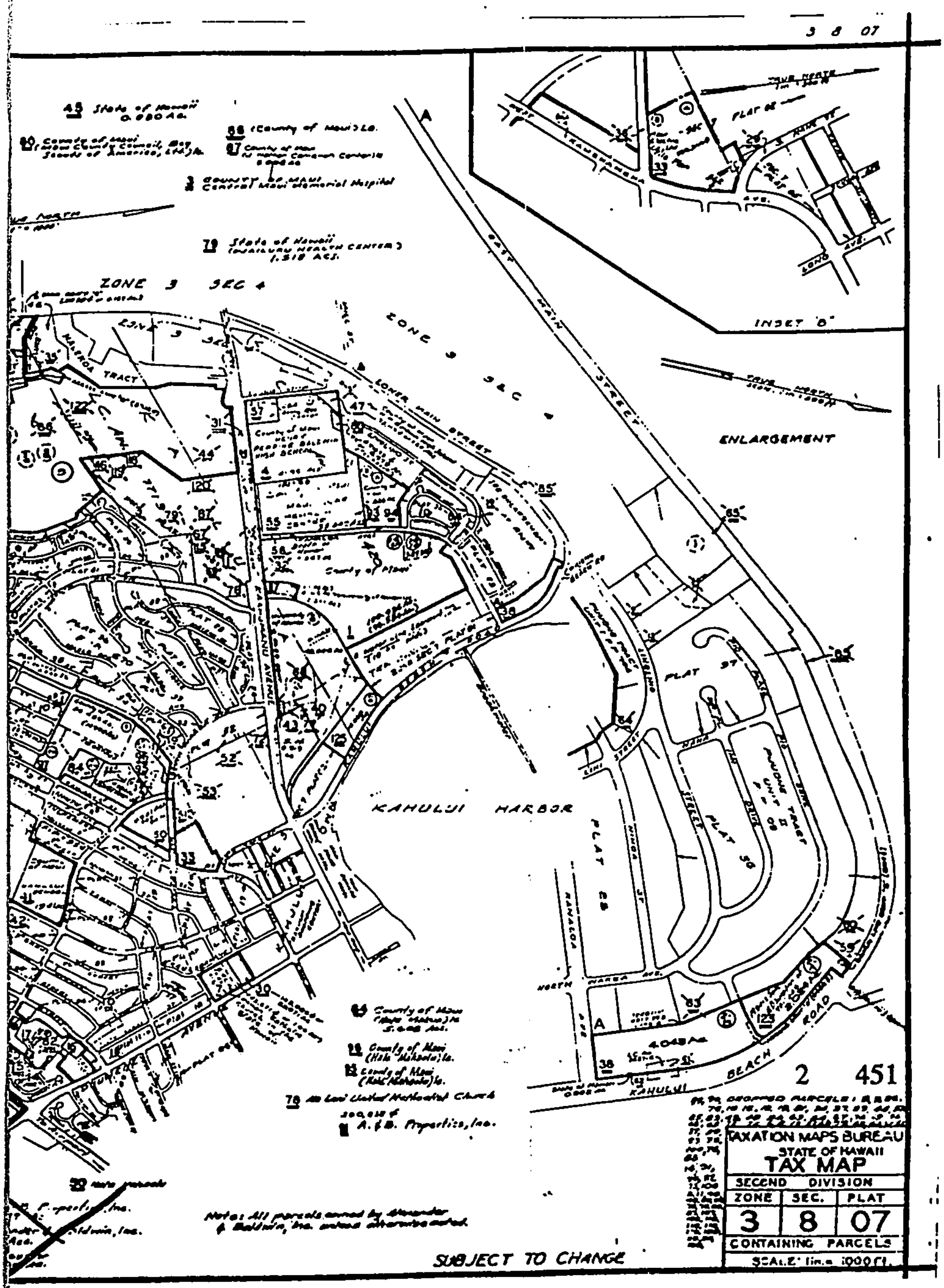
2 450

FOR. WAIKAPU - WAILUKU, MAUI


3 8 06
KAHULUI TOWN ZONE 3 SEC. 7
Camp
FIELD G
FIELD E
PLAT 01
ROAD
Field
True North
Note All lots owned by Alexander & Baldwin, Inc. unless otherwise noted.
Parcels Dropped:
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
SECOND DISTRICT
ZONE 3
SEC. 8
PLAT 06
CONTAINING PARCELS
SCALE: 1in. = 1000 ft
SUBJECT TO CHANGE

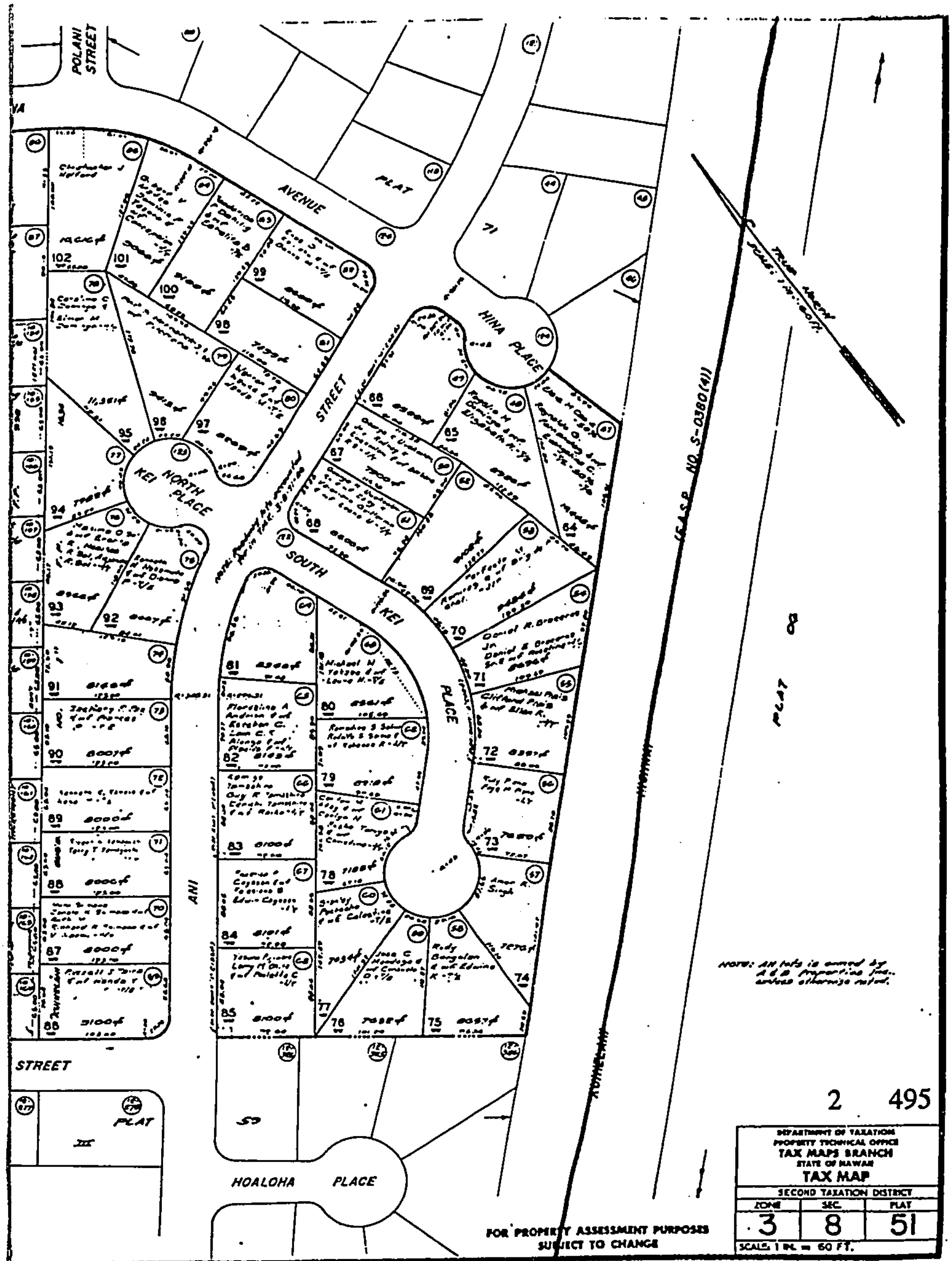


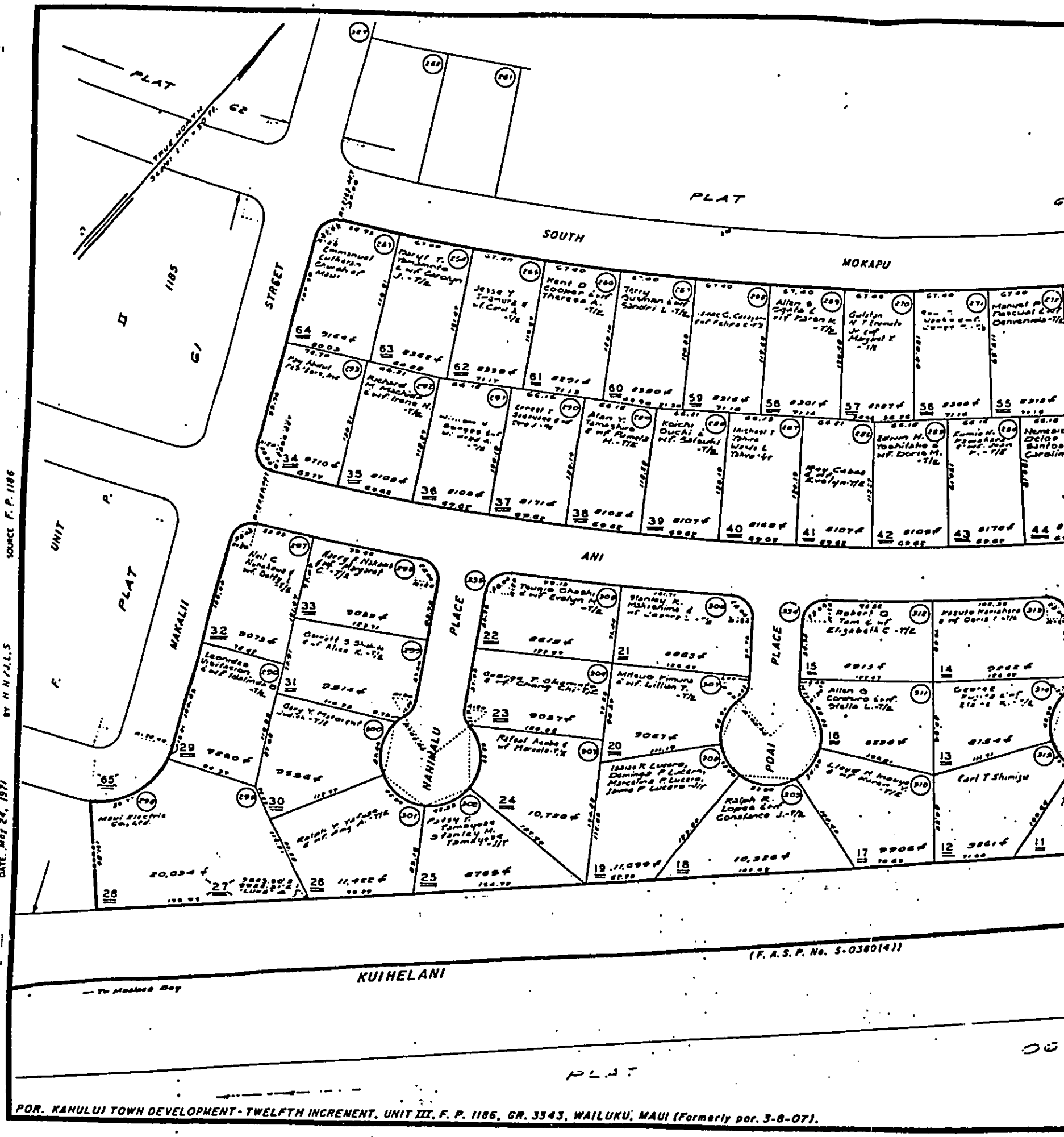
HONOAPIILANI HIGHWAY
ZONE 3 SEC. 5
ZONE 3
PLAT 35
GRANT
Maui Lani Partners
501.881 Ac.
508.170 Ac.
INSET 'A'
WEST HAWAII PLAN ST.
FILE
Kengo Tagomori
George Kondo
PUUNENE AVENUE
PLAT 08
POR. WAILUKU MAUI



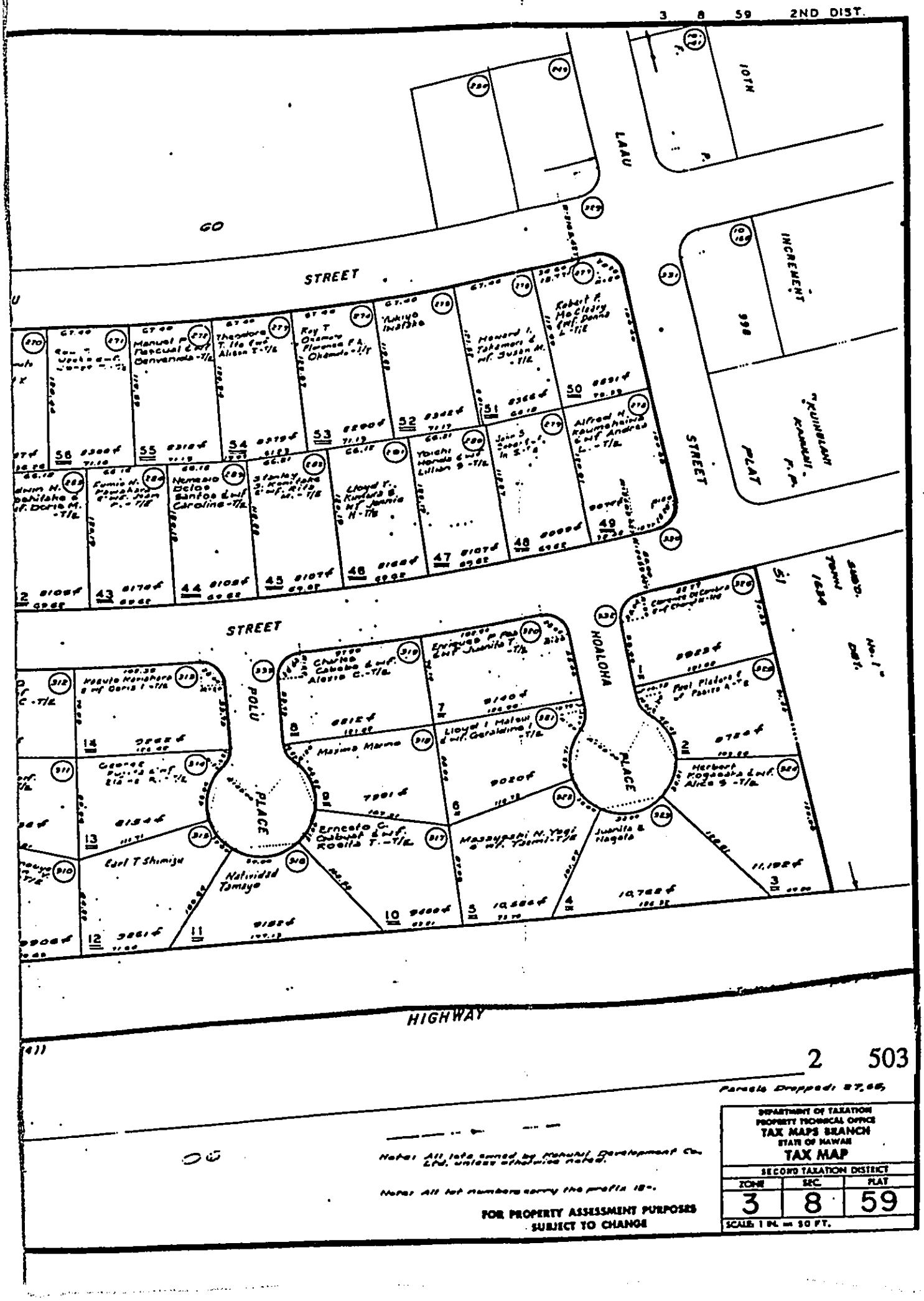
3 8 07
45 State of Hawaii 0.930 Ac.
88 (County of Maui) Le.
3 County of Maui Central Maui Memorial Hospital
79 State of Hawaii (Wailuku Health Center) 1.318 Acs.
ZONE 3 SEC 4
ZONE 3 SEC 8
LOWER MAIN STREET
MAIN STREET
KAHULUI HARBOR
PLAT 37
PLAT 36
PLAT 28
ENLARGEMENT
INSET "B"
KAMEHAMEHA
KAHULUI BEACH ROAD
KAAHUMANU AVENUE
County of Maui
2 451
TAXATION MAPS BUREAU
STATE OF HAWAII
TAX MAP
SECOND DIVISION
ZONE 3
SEC. 8
PLAT 07
CONTAINING PARCELS
SCALE: 1in. = 1000 ft.
78 Ka Lani United Methodist Church
A. & B. Properties, Inc.
Note: All parcels owned by Alexander & Baldwin, Inc. unless otherwise noted.
SUBJECT TO CHANGE

POR. KUHELANI SUBDIVISION NO. 1, FILE PLAN 1634,
POR. KAHULUI TOWN DEVELOPMENT, TENTH INCREMENT, FILE PLAN 998, GRANT 3343, WAILUKU COMMONS, WAILUKU, MAUI, HAWAII (Formerly por. 3-8-07)


POLANI STREET
AVENUE
PLAT
HINA PLACE
STREET
KEI NORTH PLACE
SOUTH KEI PLACE
ANI
STREET
HOALOHA PLACE
PLAT
2 495
DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP
SECOND TAXATION DISTRICT
ZONE 3
SEC. 8
PLAT 51
SCALE: 1 IN. = 60 FT.
FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE


PLAT
TRUE NORTH
SCALE 1 in. = 80 ft.
62
1185
61
STREET
SOUTH
MOKAPU
PLAT
SOURCE F.P. 1186
UNIT
F.
PLAT
MAKALII
ANI
PLACE
HAHIMALU
PLACE
POAI
DATE: May 24, 1971
BY H.N.J.L.S
LWG NO 6101
KUIHELANI
(F. A. S. P. No. S-0380(4))
To Maalaea Bay
PLAT
POR. KAHULUI TOWN DEVELOPMENT - TWELFTH INCREMENT, UNIT III, F. P. 1186, GR. 3343, WAILUKU, MAUI (Formerly por. 3-8-07).

3 8 59 2ND DIST.



2 503

Parcels Dropped: 27, 65

Note: All lots owned by Makuni Development Co. Ltd. unless otherwise noted.

Note: All lot numbers carry the prefix 18-.

FOR PROPERTY ASSESSMENT PURPOSES SUBJECT TO CHANGE

DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII

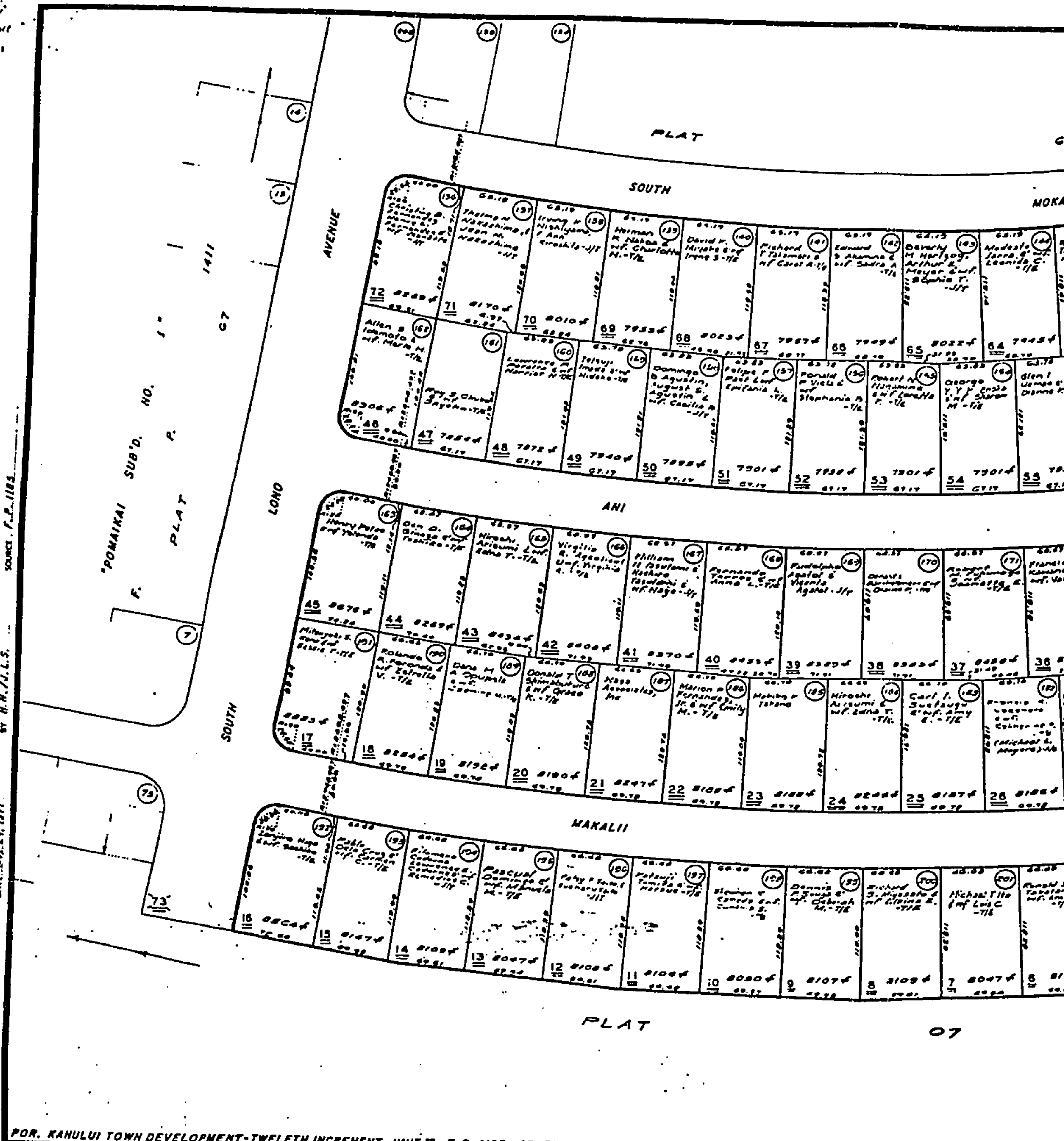
TAX MAP

SECOND TAXATION DISTRICT

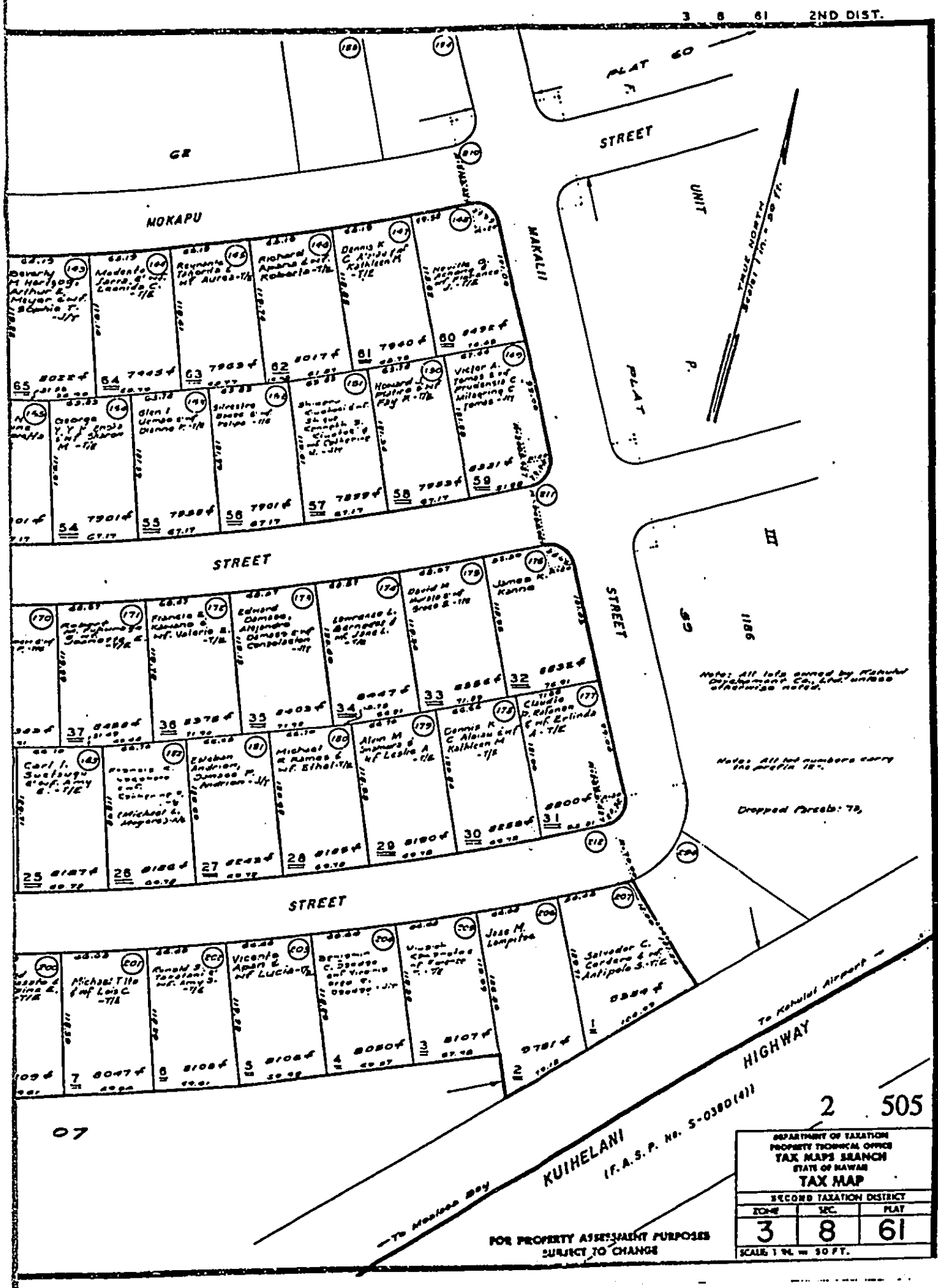
ZONE	SEC.	PLAT
3	8	59

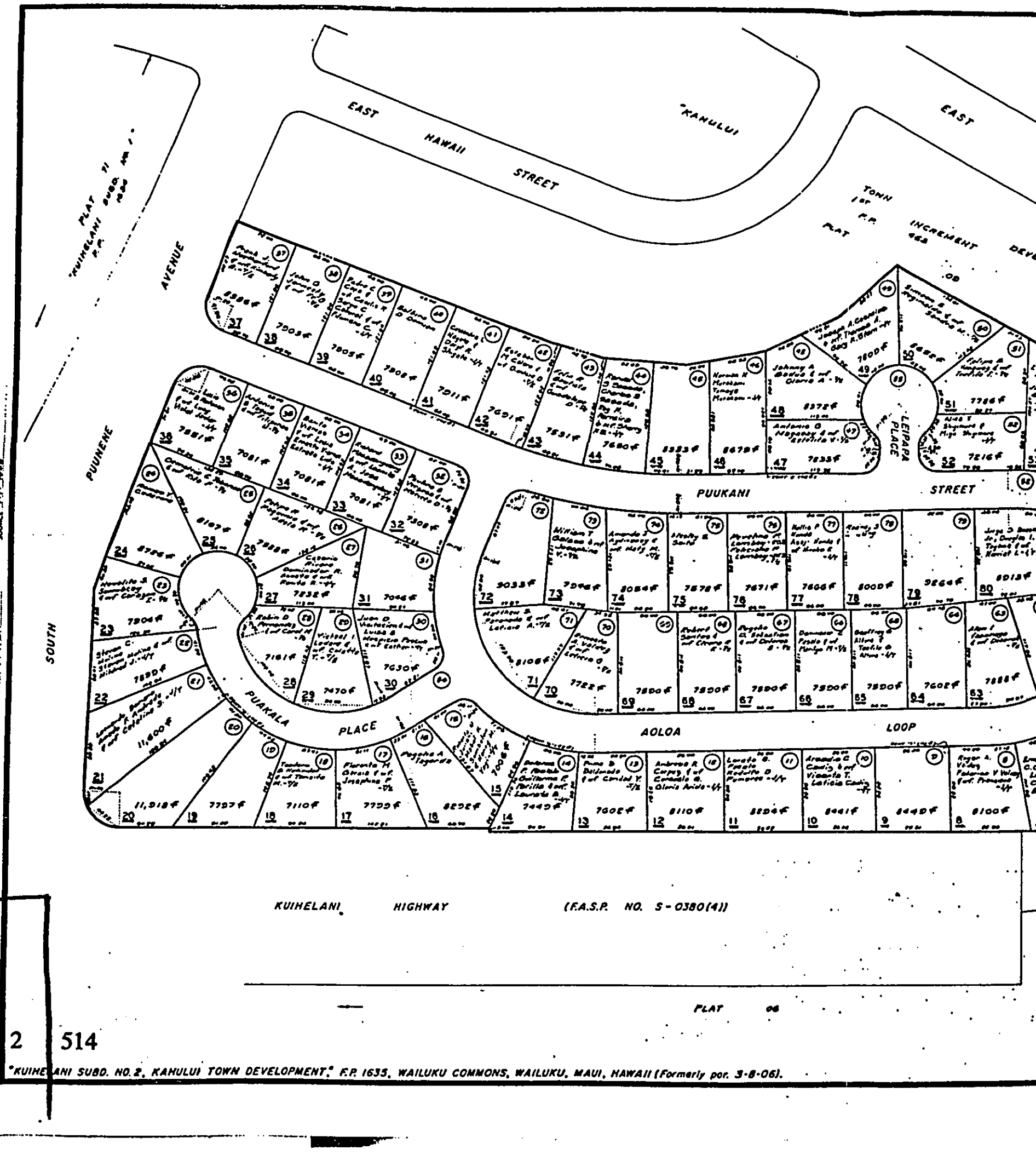
SCALE: 1 IN. = 50 FT.

DWG. NO. 6102 DATE: May 24, 1971 BY H.H./H.L.S. SOURCE: F.P. 1185

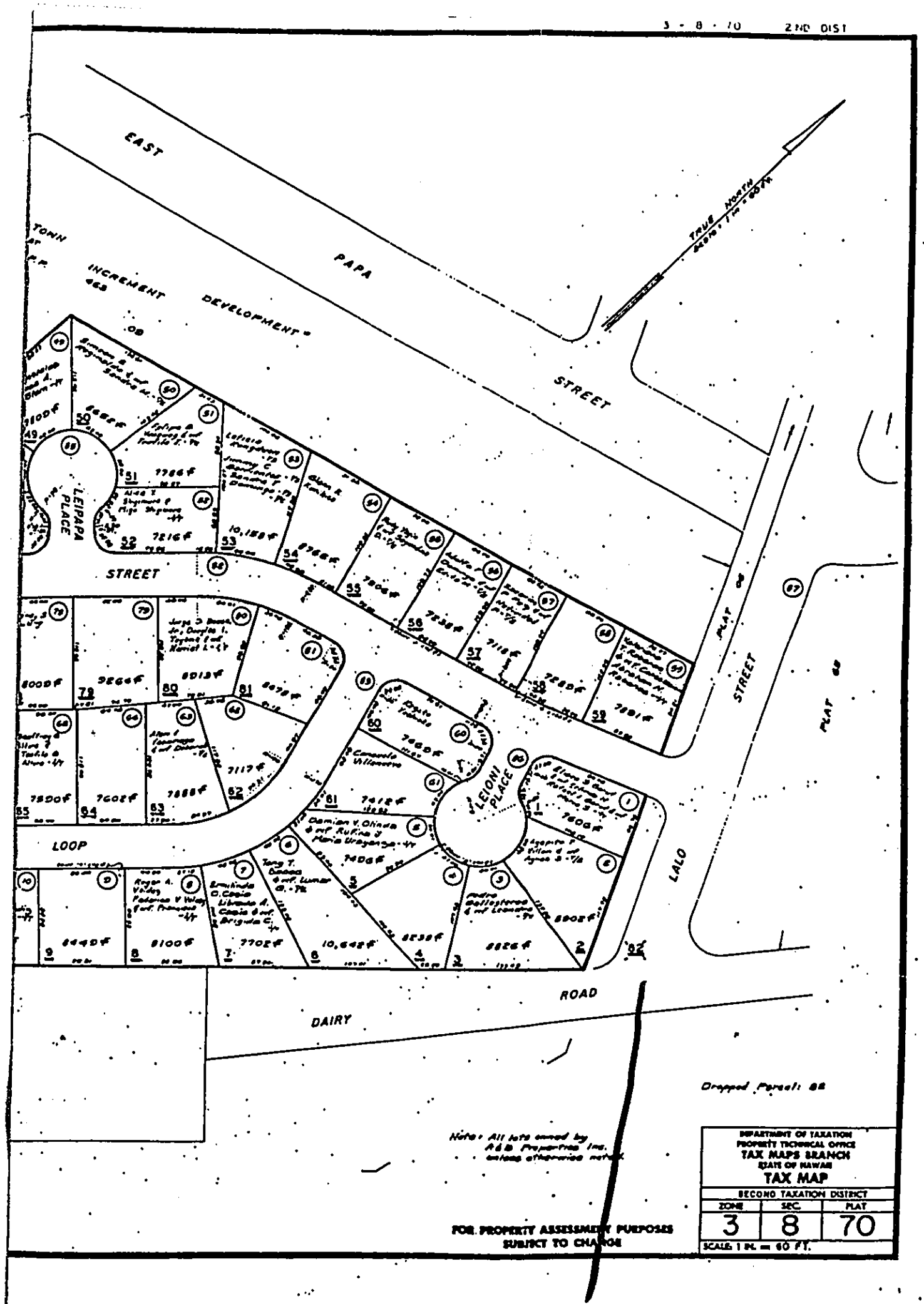


POR. KAHULUI TOWN DEVELOPMENT-TWELFTH INCREMENT, UNIT II, F. P. 1185, GR. 3343, WAILUKU, MAUI (Formerly por. 3-8-07).


PLAT 60
STREET
UNIT
P.
PLAT
TRUE NORTH
SCALE 1 IN. = 50 FT.
GR
MOKAPU
MAKALII
STREET
STREET
STREET
GR
911
Note: All lots owned by Honolulu Redevelopment Agency unless otherwise noted.
Note: All lot numbers carry the prefix 18-.
Dropped Parcels: 78,
To Kahalui Airport
HIGHWAY
KUIHELANI
To Maunalua Bay
I.F.A.S.P. No. S-0380(41)
07
2 505
DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP
SECOND TAXATION DISTRICT
ZONE 3 | SEC. 8 | PLAT 61
SCALE 1 IN. = 50 FT.
FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE


EAST HAWAII STREET
'KANULUI
EAST
AVENUE
PUUNENE
PUUKANI STREET
LEIPAPA PLACE
PUAKALA PLACE
AOLOA LOOP
SOUTH
KUIHELANI HIGHWAY (F.A.S.P. NO. S-0380(4))
PLAT 06
2 514
"KUIHELANI SUBD. NO. 2, KAHULUI TOWN DEVELOPMENT," F.P. 1635, WAILUKU COMMONS, WAILUKU, MAUI, HAWAII (Formerly por. 3-8-06).

3 - 8 - 70 2ND DIST



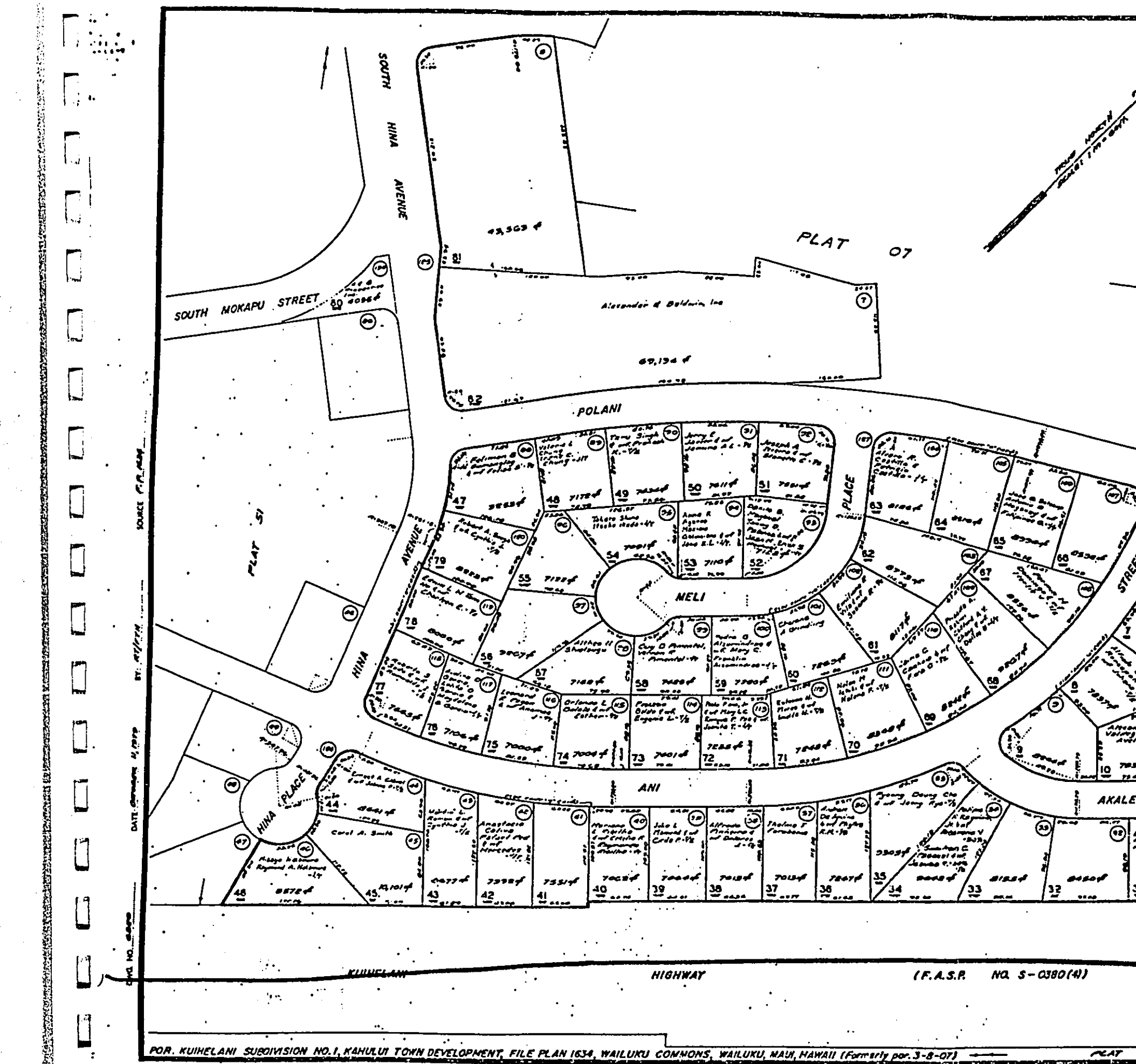
DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII

TAX MAP

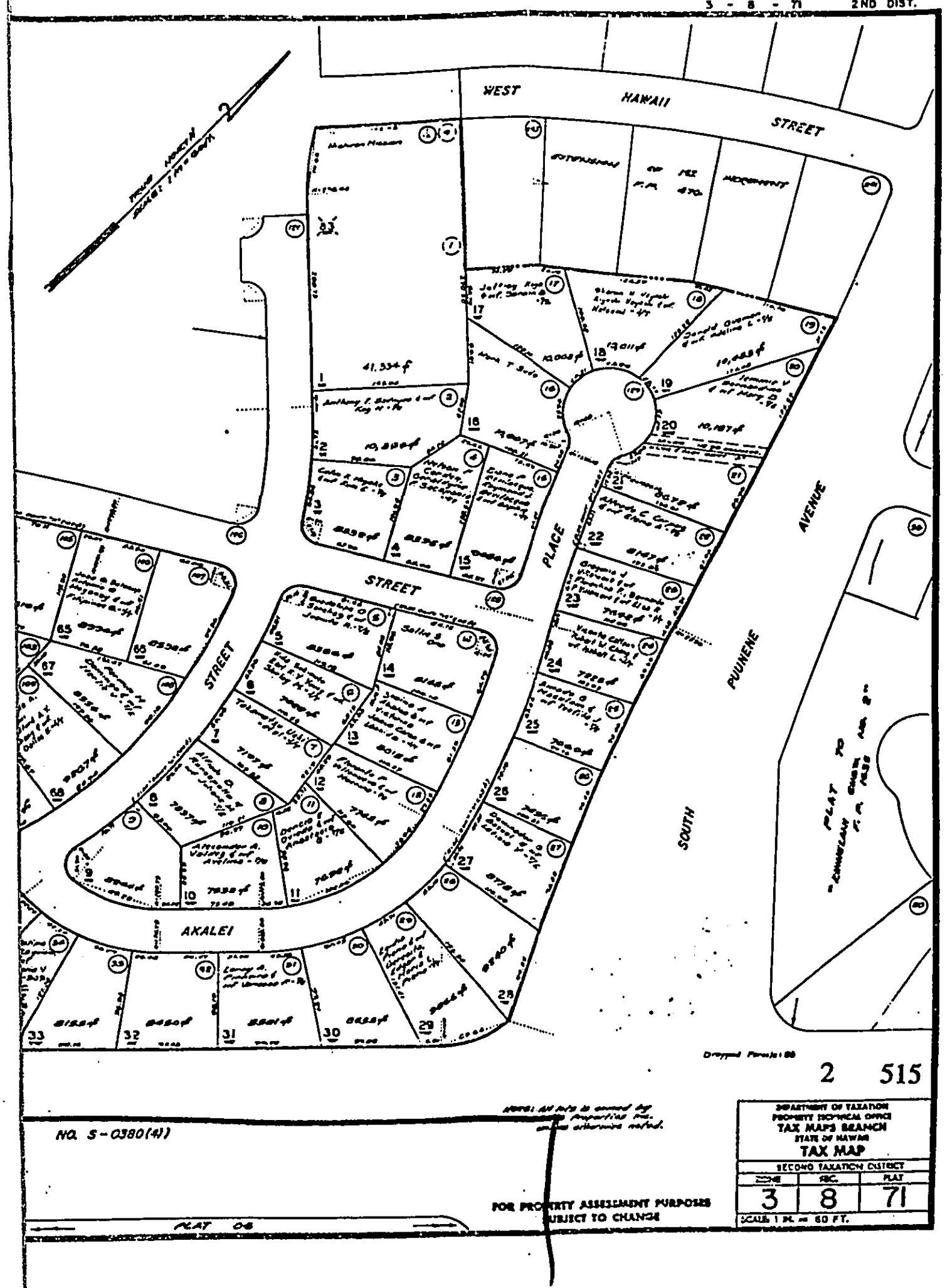
SECOND TAXATION DISTRICT

ZONE	SEC.	PLAT
3	8	70

SCALE: 1 IN. = 60 FT.


SOUTH HINA AVENUE
SOUTH MOKAPU STREET
PLAT 07
Alexander & Baldwin, Inc.
69,194 sf
POLANI
PLAT 51
HINA AVENUE
MELI
PLACE
ANI
HINA PLACE
AKALE
KUIHELANI HIGHWAY
(F.A.S.P. NO. S-0380(4))
POR. KUIHELANI SUBDIVISION NO. 1, KAHULUI TOWN DEVELOPMENT, FILE PLAN 1634, WAILUKU COMMONS, WAILUKU, MAUI, HAWAII (Formerly por. 3-8-07)
PLAT

3 - 8 - 71 2ND DIST.



2 515

DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP

SECOND TAXATION DISTRICT

ZONE	SEC.	PLAT
3	8	71

SCALE 1 IN. = 60 FT.

BOTANICAL SURVEY REPORT FOR THE PROPOSED EAST MAUI WATER DEVELOPMENT PLAN RIGHT-OF-WAY

for
PARAMETRIX, INC.
1164 Bishop Street, Suite 1600
Honolulu, Hawaii 96813

by
Evangeline J. Funk, Ph.D.
Botanical Consultants
Honolulu, Hawaii
1993

EXHIBIT D
BOTANICAL STUDY

TABLE OF CONTENTS

FIGURES

INTRODUCTION

A botanical survey of the proposed East Maui Water Development Plan right-of-way was conducted in April, 1993. The purpose of the East Maui Water Development Plan is to harvest water in the Haiku area then funnel it westward to users as far away as the junction of Kuihelani and Honoapiilani Highways. This project is envisioned to be completed in six phases (Figure 1). The vegetation of each phase along the right-of-way will be described seperately.

METHODS

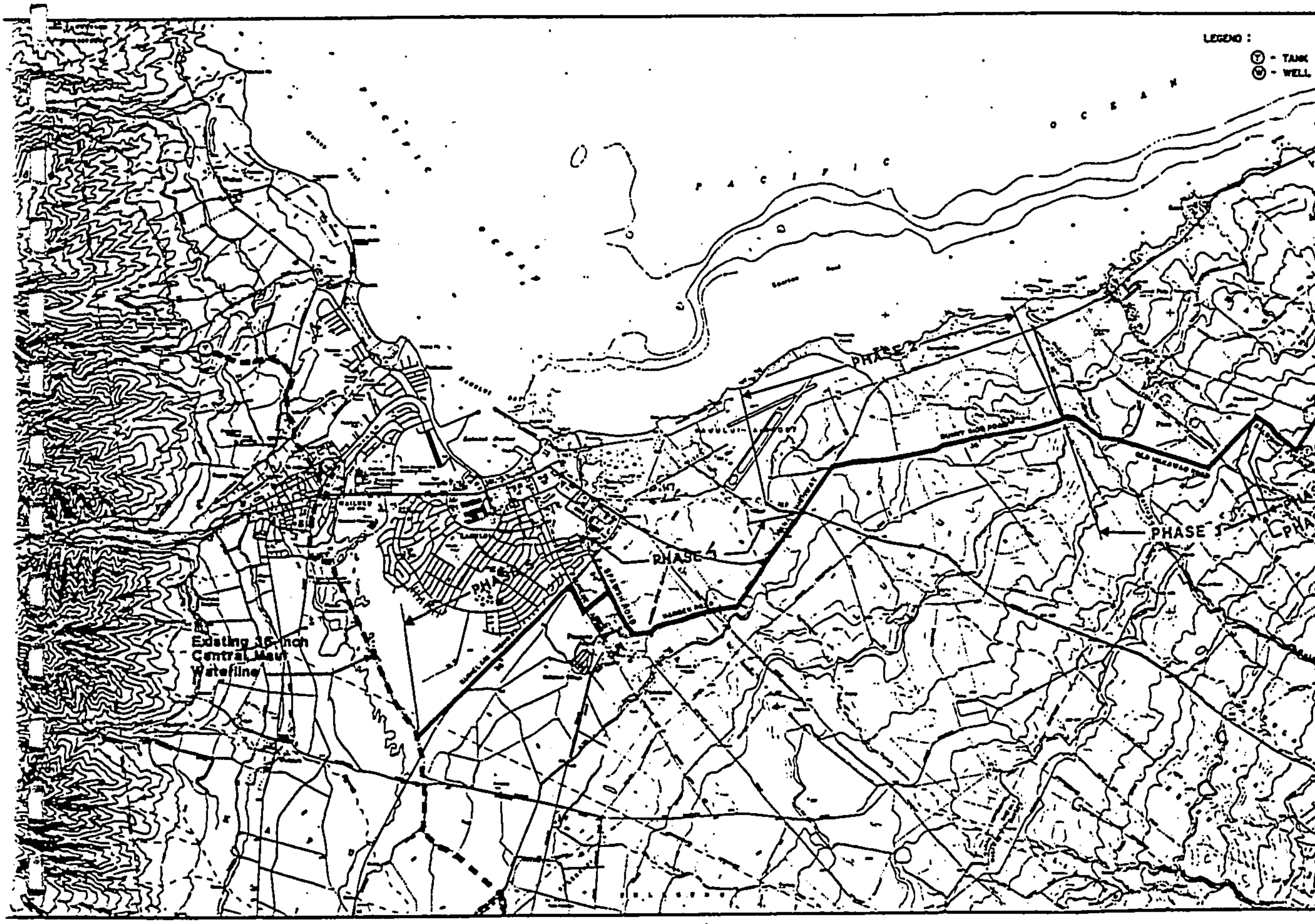
Data collection for this survey was carried out by two and three person teams. In some sections of the right-of-way, observations were made from a slow moving vehicle with frequent stops for on the ground forays and inspections. In other areas such as Maliko Gulch and other lesser gulches, on the ground searches were made. Ten man days were spent in the examination of this thirty mile corridor.

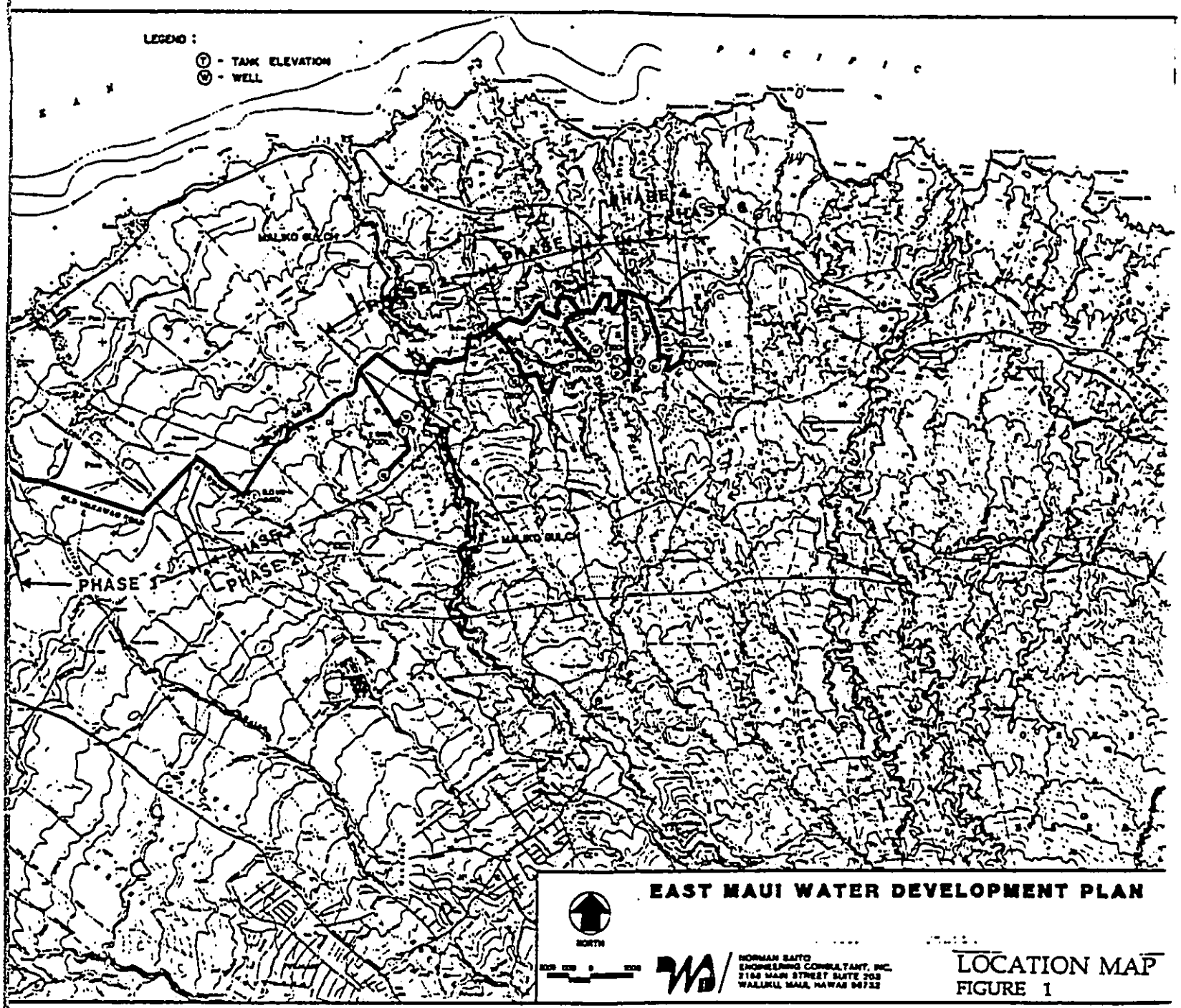
RESULTS

Phase I. The first phase of this six phase project begins just west of Maliko Gulch at two well sites on Upper Hamakuapoko Road. At the junction of Hamakuapoko Road and Holomua Road the line turns westward and follows Holomua Road to Baldwin Avenue and to the end of Old Makawao Road, a distance of about five and three quarter miles. A small section where Old Makawao Road intercepts Baldwin Avenue will be included in Phase II.

All of Phase I follows cane haul roads through working sugarcane fields (*Saccharum officinarum* L.). The weed community which develops along openings in the fields, such as roads, is kept under control by the use of herbicides. The area around the two proposed well sites on Upper Hamakuapoko Road has been cleared, but more aggressive, woody species such as koa haole

Figure 1. Location Map


LEGEND :
T - TANK
W - WELL
PACIFIC OCEAN
PHASE 2
PHASE 1
PHASE 3
Existing 16 inch
Central Maui
Waterline



LOCATION MAP
FIGURE 1

(*Leucaena leucocephela* (Lam.) de · Wit), castor bean (*Ricinus cumminus* L.), Christmas berry (*Schinus terebinthifolius* Raddi), and yellow guava (*Psidium guajava* L.) and many sorts of introduced grasses and weeds are beginning to fill the space.

Two small gorges cross the Holomua Road section of the right-of-way. In these gorges can be found a wide variety of planted trees. The most common are Java plum (*Syzygium cumini* (L.) Skeels), Chinaberry tree (*Melia azedarach* L.), Eucalyptus (*Eucalyptus robusta* Sm.), coffee (*Coffea arabica* L.), yellow guava (*Psidium guagava* L.), mango (*Mangifera indica* L.), Rose apple (*Syzygium jambos* (L.) Alston) and Christmasberry. The dense understory in the gulches is primarily made up of grasses such as molasses grass (*Melinis minutiflora* P. Beauv.) and California grass (*Brachiaria mutica* (Forssk.) Stapf), along with numerous adventives (weeds).

Phase II of the East Maui Water Development Plan consists of two sections of line and the upper Paia Tank Site. Section One of Phase II includes a half mile of line along Kauhikoa Road, sections of Haiku and Kokomo Roads, a short distance through pineapple fields to Maliko Gulch and westward to Hamakuapoko Road - a distance of about three and one half miles.

Kauhikoa Road is a paved, country road along which considerable development has occurred. The adjoining properties are landscaped and the lawns and road shoulders are kept mowed. This is a wet, lush locale and the surrounding vegetation is robust and all introduced. Eucalyptus, ironwood (*Casuarina equisetifolia* L.), guava, and avocado (*Persea americana* Mill.) trees. The under story vegetation is ferns (*Nephrolepis exaltata* (L.) Schott., *Blechnum occidentale* L.), shrubs (*Lantana camara* L.), and a variety of grasses.

Westward from Kauhikoa Road, the line follows Haiku Road through a densely populated section of Haiku Town. At Kokomo Road the line turns mauka for a short distance, then again goes westward to the pineapple fields and on to Maliko Gulch. Except for the pineapple fields, this part of the route is through a mostly urbanized area with landscaped yards and paved roads with mowed and trimmed shoulders.

Beyond the pineapple field, the line crosses Maliko Gulch just mauka of the siphon. Maliko Gulch is heavily vegetated. The canopy is twenty meters above the gulch floor and is made up of Kukui (*Aleurites moluccana* (L.) Willd.), chicle (*Manilkara zapota* L.), Java plum, and banyan trees (*Ficus microcarpa* L.). The understory contains a scant population of coffee trees and saplings of the canopy trees. The ground layer is almost non-existent except for some scattered ferns (*Adiantum hispidulum*, *Adiantum cueatum* Langs. & Fisch., *Blechnum occidentale* L., and *Dryopteris dentata* (Frosk.) C. Chr.) and tree seedlings. On the banks of the stream some taro (*Calocasia esculenta* (L.) Schott) and ginger (*Hedychium* spp.) plants were found.

Section two of Phase II traverses working sugar cane fields by way of Sunnyside Road. This is a broad, paved road with shoulders which vary from even with the road to very steep on either side. Along part of Sunnyside Road there is a line of mature monkey pod trees (*Samanea saman* (Jacq.) Merr.), but generally, the wayside plant community is kept under control by the use of herbicides.

Phase III is also composed of two sections, one, in the Haiku area includes West Kuiaha Road and Haiku Road as far as Kauhikoa Road. The second section is along Hana Highway from Haleakala Highway to Dairy Road by way of Hansen and

Spanish Roads.

The portion which includes West Kuiaha Road to Kauhikoa Road along Haiku Road or Part 1, Phase III is approximately two miles long. All of these roads are paved and considerable development has taken place in the area. The road shoulders are mowed or have been landscaped with a variety of trees and shrubs.

In one place, where Ohia Gulch crosses Haiku Road, deep cuts were made for the road right-of-way leaving steep banks on the mauka side. In this area the most common vegetation is Eucalyptus spp., mango, African tulip (*Spathodia campanulata* P. Beauv.), and Norfolk island pine (*Auraucaria hetrophylla* (Salisb.) Franco) trees. The understory is almost completely missing or consists of Christmasberry, Ti (*Cordyline fruticosa* (L.) A. Chev.), Hibiscus, Bouganvillea, and other types of cultivars. The ground layer is common ferns, grasses and adventives.

Phase III, Section 2. From the junction of Haleakala Highway to the junction of Hansen Road, Hana Highway, the path of the line, is a major highway with broad, mowed shoulders which passes through sugarcane fields. Many common weeds species such as puncture vine (*Tribulus terrestris* L.), wild bean (*Macroptilium lathroides* (L.) Urb.), prickly lettuce (*Lactuca serriola* L.), Pualele (*Sonchus olerarceus* L.), pigweed (*Portulaca oleracea* L.), yellow poppy (*Argemone mexicana* L.), buffel grass (Cenchrus ciliaris L.) and Bermuda grass (*Cynodon dactylon* (L.) Pers.) are all part of the vegetation community which is kept mowed.

Along Hansen Road the vegetation community includes African tulip, ironwood, monkey pod, and earpod (*Entrolobium cyclocarpum* (Lacq.) Griseb.) trees. Long stretches in this area are filled with Castor bean (Ricinus cummunis L.), koa haole, wild tomato (*Lycopersicon pimpinellifolium* (Just.) Mill. bushes

and buffel grass.

Phase IV is quite short, only one and one half miles. It includes East Kuiaha Road and the short stretch of Haiku Road from East Kuiaha Road to West Kuiaha Road. All of the roads are paved and the road shoulders are either mowed or landscaped. In those places where development has not taken place the vegetation is Eucalyptus, mango, Java plum, rose apple, and guava trees. Ferns and grasses such as palm grass (*Setaria palmifolia* (Koen.) Stapf.) and elephantgrass (*Pennisetum purpureum* Schumach) are common.

Phase V includes the right-of-way along the connector between Spanish Road and Puunene Avenue, a short portion of Puunene Avenue and Kuihelani Highway to Honoapiilani Highway.

The connector between Spanish Road and Puunene Avenue is a service road through sugarcane fields. The berms on either side of the road have recently been treated with herbicide. Some very hardy plants such as bitter melon (*Momordica charantia* Crantz), Alena (*Boerhavia repens* L.), Chinese violet (*Asystasia gangetica* (L.) T. Anders), and buffel grass have survived the weed killer.

Puunene Avenue is a main thoroughfare and its most striking feature is the line of large, windswept, monkey pod trees between it and the surrounding sugarcane fields. Some grasses such as buffel grass and *Chloris barbata* and lowland weeds such as Australian saltbush (*Atriplex semibaccata* R. Br.), prickly lettuce (*Lactuca serriola* L.), Alena, and nut grass (*Cyperus rotundus* L.) can also be found.

Kuihelani Highway from Puunene Road to Honoapiilani Highway is a four lane, heavily travelled road. The shoulders are broad and the vegetation is kept low. Inspite of the regular care a fair number of weedy species persist.

Indigo (*Indigo suffruticosa* Mull.), smooth rattle box (*Crotalaria pallida* Aiton), Partridge pea (*Chamaecrista nictitans* (L.) Moench), sensitive plant (*Mimosa pudica* L.), wild bean, Spanish needle (*Bidens pilosa* L.), and beggar's tick (*Desmodium triflorum* (L.) DC), and several grass species to name a few.

Phase VI includes Peahi Road from the wells to Haiku Road and a short distance along Haiku Road to East Kuiaha Road- one and one quarter miles in all. Even though Peahi Road is the most remote section of the proposed project, the street is paved and the shoulders are trimmed. The wayside vegetation includes Siris (*Albizia lebbeck* (L.) Benth.), Eucalyptus, and Christmasberry trees. Introduced grasses and ferns are common. A variety of weeds fill all of the space. Near the houses, quite often, dense mats of *Wedelia trilobata* (L.) Hitchc. abut Peahi Road.

The section of Haiku Road to East Kuiaha Road is paved and passes through a developed area with landscaped properties on either side.

During this survey, three native taxa, Ulei (*Osteomeles anthylidifolia* (Sm.) Lindl.), Moa (*Psilotum nudium* L.), and Koali or blue morningglory (*Ipomoea indica* (J. Burm.) Merr.) were found. The remainder of the vegetation is made up of introduced species.

ENDANGERED SPECIES

No proposed or listed threatened or endangered plant species as set forth by the U. S. Department of the Interior Fish and Wildlife Service (Endangered Species Act of 1973, [16 U.S.C. 1531 - 1543] as amended. USFWS 1992) were encountered.

SPECIES LIST

The plant families in the following species list have been alphabetically arranged within three groups, Ferns and Fern Allies, Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of St. John (1973) and Wagner, Herbst and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to The Hawaiian Islands since Cook or by the aborigines.
2. The scientific name.
3. The Hawaiian name and or the most widely used common name.
4. Abundance ratings are for this site only and they have the following meanings:

   Uncommon = a plant that was found less than five times.

   Occasional = a plant that was found between five to ten times.

   Common = a plant considered an important part of the vegetation.

   Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of these areas during the beginning of the growing season (April 1993) and it reflects the vegetative composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different season.

Scientific Name	Common Name	Abundance
FERNS AND FERN ALLIES		
PSILOTAACEAE - Psilotum Family		
Psilotum nudum L.	Moa	Uncommon
POLYPODIACEAE - Common Fern Family		
**Adiantum hispidulum*	Coarse maidenhair	Locally abundant
**Adiantum cueatum* Langs. & Fisch.	Maiden hair fern	Common
**Blechnum occidentale* L.	Blechum	Locally abundant
**Dryopteris dentata* (Frosk.) C. Chr.	Oak leaf fern	Occasional
**Polypodium scolopendrium* Burm. f.	Lauai	Locally abundant
**Sphenomeris chusana* (L.) Copel.	Palaa	Occasional
**Nephrolepis exaltata* L.	Boston fern	Locally abundant
MONOCOTYLEDONES		
ARACEAE - Arum family		
**Calocasia esculenta* (L.) Schott	Taro	Locally abundant
**Xanthosoma roseum* Schott		Uncommon
ARAUCARIACEAE - Araucaria Family		
**Araucaria heterophylla* (Salisb.) Franco	Norfolk Island pine	Uncommon
ARECACEAE - Palm Family		
**Cocos nucifera* L.	Coconut	Occasional
BROMELIACEAE - Pineapple Family		
**Ananas comosus* (Stickm.) Merr.	Pineapple	Locally abundant
COMMELINACEAE - Spiderwort Family		
**Commelina diffusa* N. L. Burm.	Honohono	Locally abundant
CYPERACEAE - Sedge Family		
**Cyperus rotundus* L.	Nut grass	Locally abundant
GRAMINEAE - Grass Family		
**Bambusa valgaris* Schrad ex Wendl	Bamboo	Locally abundant
**Brachiaria mutica* (Forsk.) Staph	Paragrass	Locally abundant
**Cenchrus ciliaris* L.	Buffel grass	Locally abundant
**Cenchrus echinatus* L.	Sandbur grass	Locally abundant

Scientific Name	Common Name	Abundance
POACEAE - Grass Family con't		
**Chloris barbata* Swartz	Swollen fingergrass	Locally abundant
**Chloris divaricata* R. Br.	Stargrass	Locally abundant
**Chloris inflata* Link		Occasional
**Cynodon dactylon* (L.) Pers.	Bermuda grass	Common
**Digitaria adscendens* (HBK) Henr.	Henry's crabgrass	Occasional
**Digitaria violascens* Link	Smooth crabgrass	Locally abundant
**Digitaria insularis* (L.) Ness	Sourgrass	Occasional
*Echinochloa colonum (L.) Link	Jungle rice	Occasional
**Eleusine indica* (L.) Gaertn.	Wiregrass	Common
**Eragrostis cilianensis* (All.) Link	Stinkgrass	Uncommon
**Melinis minutiflora* P. Beauv.	Molasses grass	Locally abundant
**Oplismenus hirtellus* (L.) P. Beauv.	Basketgrass	Locally abundant
**Panicum maximum* Jacq.	Guinea grass	Common
**Panicum coloratum* L.	Blue panic grass	Locally abundant
**Paspalum conjugatum* Bergius	Hilo grass	Locally abundant
**Paspalum dilatatum* Poir.	Dallis grass	Occasional
**Paspalum orbiculare* Forst	Rice grass	Occasional
**Pennisetum purpureum* Schumach	Napier grass	Locally abundant
**Rhynchelytrum repens* C.E.Hubb	Natal redtop	Common
**Setaria glauca* (L.) Beauv.	Yellow foxtail	Occasional
**Setaria palmifolia* (Koen.) Stapf	Palm grass	Locally abundant
**Sporobolus diander* (Retz.) Robyns & Tournay	Smutgrass	Occasional
LILIACEAE - Lily Family		
**Cordyline fruticosa* (L.) A. Chev.	Ti	Occasional
**Hymenocallis littoralis* (Jacq.) Salisb.	Spider lily	Uncommon
PANDANACEAE - Screw pine Family		
**Pandanus tectorius* S. Parkinson ex Z	Screw pine	Uncommon
ZINGIBERACEAE - Ginger Family		
**Hedychium* spp.	Ginger	Occasional
DICOTYLEDONES		
ACANTHACEAE - Acanthus Family		
**Asystasia gangetica* (L.) T. Anders	Chinese violet	Common
**Justica betonica* L.	White shrimp plant	Uncommon
**Thunbergia alata* Bojer	Black-eyed Susan vine	Common
**Thunbergia fragrans* Rosb.	White thunbergia	Common

Scientific Name	Common Name	Abundance
AMARANTHACEAE - Amaranth Family		
**Alternanthera pungens* Kunth	Khaki weed	Occasional
**Amaranthus spinosus* L.	Spiny amaranth	Common
**Amaranthus viridis* L.	Slender ameranth	Common
ANACARDIACEAE - Mango Family		
**Mangifera indica* L.	Mango	Occasional
**Schinus terebinthifolius* Raddi	Christmas berry	Occasional
APIACEAE - Parsley Family		
**Centella asiatica* (L.) Urb.	Asiatic pennywort	Locally abundant
**Daucus pusillus* Michx.	American carrot	Locally abundant
ASTERACEAE - Sunflower Family		
**Ageratum conyzoides* L.	Maile honohono	Locally abundant
**Bidens alba* (L.) DC		Common
**Bidens pilosa* L.	Spanish needle	Common
**Conyza canadensis* Cronq.	Canadian fleabane	Occasional
**Crassocephalum crepidioides (Benth.)*		*Common*
**Eclipta alba* (L.) Hassk	False daisy	Uncommon
**Elephantopus spicatus* Juss. ex. Aubl.		Locally abundant
**Emilia sonchifolia* (L.) DC	Flora's paint brush	Common
**Gnaphalium purpureum* L.	Purple cudweed	Occasional
**Lactuca serriola* L.	Prickly lettuce	Occasional
**Pluchea symphytifolia* (Mill.) Gillis	Sourbush	Occasional
**Sigesbeckia orientalis* L.	Small yellow crown-beard	Occasional
**Sonchus olerarceus*L.	Pualele	Occasional
**Synedrella nodiflora* (L.) Gaertn.	Nodeweed	Occasional
**Tridax procumbens* L.	Coat buttons	Locally abundant
**Verbesina encelioides* Cav.	Golden crown-beard	Occasional
**Vernonia cinerea* (L.) Less.	Little ironweed	Occasional
**Wedelia trilobata* (L.) Hitchc.		Locally abundant
**Youngia japonica* (L.) DC	Hawksbeard	Occasional
BIGNONIACEAE - Bignonia Family		
**Spathodea campanulata* P. Beauv.	African Tulip tree	Occasional
BORAGINACEAE - Borage Family		
**Heliotropum procumbens* Mill.		Uncommon
BRASSICACEAE - Mustard Family		
**Lepidium virginicum* L.		Locally abundant

Scientific Name	Common Name	Abundance
CACTACEAE - Cactus Family		
**Hylocereus undatus* (Haw.) Britton & Rose	Night-blooming cereus	Locally abundant
CAPPARIDACEAE - Caper Family		
**Gynandropsis gynandra* (L.) Briq.	Wild spider flower	Common
CARICACEAE - Papaya Family		
**Carica papaya* L.	Papaya	Occasional
CASUARINACEAE - Casuarina Family		
**Casuarina equisetifolia* L.	Ironwood	Occasional
CHENOPODIACEAE - Goosefoot Family		
**Atriplex suberecta* L.	Salt bush	Occasional
CONVOLVULACEAE - Moringglory Family		
**Ipomoea batatas* (L.) Lam.	Sweet potato	Uncommon
Ipomoea indica (J. Burm.) Merr.	Koali	Occasional
**Ipomoea obscura* (L.) Ker-Gawl		Occasional
**Ipomoea triloba* L.	Little Bell	Occasional
CRASSULACEAE - Orpine Family		
**Kalanchoe pinnata* (Lam.) Pers.	Air plant	Uncommon
CUCURBITACEAE - Cucumber Family		
**Momordica charantia* Crantz	Balsam apple	Occasional
EUPHORBIACEAE - Spurge Family		
**Aleurites moluccana* (L.) Willd.	Kukui	Occasional
**Chamaesyce hirta* L.	Hairy spurge	Common
**Chamaesyce hypericifolia* Mellsp.	Graceful spurge	Common
**Chamaesyce hyssopifolia* (L.) Small		Locally abundant
**Chamaesyce prostrata* (Ait) Millsp.	Prostrate spurge	Occasional
**Euphorbia cyathophora* J. A. Murray	Mexican fire plant	Locally abundant
**Phyllanthus debilis* Klein & Willd.	Niruri	Occasional
**Ricinus communis* L.	Castor bean	Occasional
FABACEAE - Bean Family		
**Albizia lebbeck* (L.) Benth.	Siris tree	Locally abundant

Scientific Name	Common Name	Abundance
FABACEAE - Bean Family con't		
**Alysicarpus vaginalis* (L.) DC.	One-leaved Clover	Locally abundant
**Caesalpinia* sp.		Uncommon
**Canavalia cathartica* Thouars	Mounaloa vine	Occasional
**Cassia leschenaultiana* DC.	Japanese tea	Occasional
**Crotalaria incana* L.	Fuzzy rattle-pod	Occasional
**Crotalaria mucronata* L.	Smooth rattle-pod	Common
**Desmanthus virgatus* Willd.	Virgate mimosa	Occasional
**Desmodium tortuosum* (Sw.) DC	Flordia beggar weed	Occasional
**Desmodium triflorum* (L.) DC		Common
**Enterolobium cyclocarpum* (Jacq.) Griseb.	Earpod	Uncommon
**Glycine wightii* (Wight & Arnott) Verdc.		Locally abundant
**Indigofera suffruticosa* Mill.	Indigo	Occasional
**Leucaena leucocephala* deWit	Koa-haole	Common
**Macroptilium lathyroides* (L.) Urb.	Wild bean	Common
**Medicago polymorpha* L.	Bur clover	Locally abundant
**Melilotus indica* (L.) All.	Clover	Common
**Mimosa pudica* L.	Sensitive plant	Locally abundant
**Pithecellobium dulce* Benth.	Madras thorn	Occasional
**Samanea saman* (Jacq.) Merr.	Monkeypod	Occasional
**Senna occidentalis* (L.) Link	Coffee senna	Occasional
**Cassia pendula* (Humb. & Bonpl. ex Willd.) H. Irwin & Barneby		Occasional
**Senna surattensis* H. Irwin & Barn.	Kolomona	Locally abundant
LAURACEAE - Laurel Family		
**Persea americana* Mill.	Avacado	Uncommon
MALVACEAE - Hibiscus Family		
**Abutilon grandifolium* Sweet	Hairy abutilon	Uncommon
**Malvastrum coromandelianum* Garcke	False marrow	Common
**Sida fallax* Walp.	'Ilima	Common
**Sida rhombifolia* L.	Cuba jute	Occasional
**Sida spinosa* L.	Prickly sida	Occasional
MELIACEAE - Mahogany Family		
**Melia azedarach* L.	Neem tree	Occasional
MORACEAE - Fig Family		
**Ficus microcarpa* L. fil.	Chinese banyan	Uncommon
MYRTACEAE - Myrtle Family		
**Eucalyptus citriodora* Hook.	Lemon-scented gum	Occasional
**Eucalyptus robusta* Sm.	Swamp mahogany	Locally abundant

Scientific Name	Common Name	Abundance
MYRTACEAE - Myrtle Family Con't		
**Psidium guajava* L.	Guava	Occasional
**Syzygium cumini* L.	Java plum	Common
**Syzygium jambos* (L.) Alston	Rose apple	Locally abundant
**Tristania conferta* R. Br.	Brisbane box	Locally abundant
NYCTAGINACEAE - Four-o'clock Family		
**Boerhavia repens* L.	Alena	Occasional
**Mirabilis jalapa* L.	Four-o'clock	Occasional
OLEACEAE - Olive Family		
**Olea europaea* L.	Olive	Uncommon
OXALIDACEAE - Wood sorrel Family		
**Oxalis corniculata* L.	Yellow wood sorrel	Occasional
**Oxalis corymbosa* DC	Pink wood sorrel	Uncommon
PAPAVERACEAE - Poppy Family		
**Argemone mexicana* L.	Mexican poppy	Locally abundant
PASSIFLORACEAE - Passionflower Family		
**Passiflora edulis* Sims	Lilikoi	Occasional
**Passiflora suberosa* L.	Huehue haole	Occasional
**Passiflora foetida* L.	Love-in-a-mist	Occasional
PHYTOLACCACEAE - Pokeweed FAmily		
**Rivina humilis* L.	Coral berry	Occasional
POLYGONACEAE - Buckwheat Family		
**Polygonum aviculare* L.		Common
PORTULACACEAE - Purslane Family		
**Portulaca oleracea* L.	Pigweed	Occasional
Portulaca pilosa L.	Akulikuli	Locally abundant
PRIMULACEAE - Primrose Family		
*Anagalis arvensis L.	Scarlet pimpernel	Occasional

Scientific Name	Common Name	Abundance
PROTEACEAE - Silk Oak Family		
**Grevillea robusta* A. Cunn	Silk oak	Occasional
ROSACEAE - Rose Family		
Osteomeles anthylidifolia (Sm) Lindl.	Ulei	Uncommon
**Rubus rosifolius* Sm.	Thimbleberry	Locally abundant
RUBIACEAE - Coffee Family		
**Coffea arabica* L.	Arabian coffe	Locally abundant
SAPOTACEAE - Sapodilla Family		
**Manilkara zapota* L.	Chicle tree	Locally abundant
SOLANACEAE - Tomato Family		
**Lycoperscicon pimpinellifolium* (Jusl.) Mill.	Wild tomato	Uncommon
Solanum americanum Mill.	Popolo berry	Occasional
**Solanum linnaeanum* Hepper & P. Jaeger	Apple of sodom	Uncommon
STERCULIACEAE - Stink tree Family		
**Waltheria indica* L.	Hi'aloa, uha-loa	Locally abundant
TILIACEAE - Linden Family		
**Triumfetta semitriloba* Jacq.	Sacramento bur	Uncommon
VERBENACEAE - Verbena Family		
**Citharexylum caudatum* L.	Fiddlewood tree	Occasional
**Lantana camara* L.	Lantana	Occasional
**Stachytarpheta jamaicensis* Vahl.	Vervain	Common
**Verbena litoralis* L.	Owi	Occasional
ZYGOPHYLLACEAE -Creosote bush Family		
**Tribulus terrestris*L.	Puncture vine	Occasional

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AVIFAUNAL AND FERAL MAMMAL SURVEY OF LANDS INVOLVED IN THE EAST MAUI WATER DEVELOPMENT PROJECT, MAUI

Prepared for

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by

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5 May 1993

EXHIBIT E

AVIFAUNAL SURVEY REPORT

INTRODUCTION

The purpose of this report is to summarize the findings of a three day (30 April, 1-2 May 1993) bird and mammal field survey of lands proposed for the East Maui Water Development Project, Maui (see Fig. 1,2). Also included are references to pertinent literature as well as unpublished reports.

The objectives of the field survey were to:

1- Document what bird and mammals species occur on the property or may likely be found there given the type of habitats available.

2- Provide some baseline data on the relative abundance of each species.

3- Determine the presence or likely occurrence of any native fauna, particularly any that are considered "Endangered" or "Threatened". If such occur or may likely be found on the property identify what if any features of the habitat may be essential for these species.

4- Determine if the property contains any special or unique habitats that if lost or altered by development might result in a significant impact on the fauna in this region of the island.

GENERAL SITE DESCRIPTION

Figure One and Two indicate the proposed alignment and area of development. Sugar cane fields dominate this region of the island. Irrigation ditches, brush and weeds occur along the edges of fields and roads. Several gulches with large trees and dense undergrowth traverse the area. The largest and deepest of these is Maliko Gulch. The stream in this gulch was not running in the region of the survey. The large size of the stream bed indicates that when there is water moving down the gulch the flow is significant. Lands east of Maliko Gulch include residential property and pasture lands. Rainfall in this area is higher, judging from the amount of vegetation.

Weather during the survey was overcast and cool with passing light showers in the morning. Winds were gusty NE tradewinds (20-25 mph).

STUDY METHODS

Field observations were made with the aid of binoculars and by listening for vocalizations. These observations were concentrated

during the peak bird activity periods of early morning and late afternoon.

At various locations and in all representative habitats (see Fig. 1,2) eight minute counts were made of all birds seen or heard. Between these count stations observations of birds were also kept. These data provide the basis for the relative abundance estimates given in this report. Unpublished reports of birds known from this region were also reviewed in order to acquire a more complete picture of possible avifaunal activity (Bruner 1981, 1990, 1991). Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks. No attempts were made to trap mammals in order to obtain data on their relative abundance and distribution. Two evenings were devoted to searching for the presence of owls and the Hawaiian Hoary Bat (Lasiurus cinereus semotus).

Scientific names used herein follow those given in Hawaii's Birds (Hawaii Audubon Society 1989); A field guide to the birds of Hawaii and the Tropical Pacific (Pratt et al. 1987) and Mammal species of the World (Honacki et al. 1982).

RESULTS AND DISCUSSION

Resident Endemic (Native) Land Birds:

No endemic species were recorded. One possible species which may occur occasionally in this area is the Hawaiian Owl or Pueo (Asio flammeus sandwichensis). Pueo are reasonably common in agricultural lands on Maui, particularly on the upper slopes of Haleakala but are seen less frequently in more urban habitat (Hawaii Audubon Society 1989).

Resident Endemic (Native) Waterbirds:

No endemic waterbirds were discovered on the field survey. Two species, Black-necked Stilt (Himantopus mexicanus knudseni) and American Coot (Fulica americana alai), may use the ditches and irrigations ponds found in the area. These two species are listed as endangered. Stilt are particularly opportunistic and will forage in flooded fields as well as in more permanent wetlands. Kanaha Pond and Kealia Pond are the two most important and heavily used sites on Maui for both stilt and coot.

Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August through late April. Some juveniles will stay over the summer months as

well (Johnson et al. 1981, 1983, 1989). Of all the shorebird species which winter in Hawaii the Pacific Golden Plover (Pluvialis fulva) is the most abundant. Plover prefer open areas such as mud flats, lawns, pastures, plowed fields and roadsides. They arrive in Hawaii in early August and depart to their arctic breeding grounds during the last week of April (Johnson et al. 1981). Bruner (1983) has also shown plover are extremely site-faithful on their wintering grounds and many establish foraging territories which they defend vigorously. Such behavior makes it possible to acquire a fairly good estimate of the abundance of plover in any one area. These populations likewise remain relatively stable over many years (Johnson et al. 1989). A total of only three plover were recorded on the survey. An earlier survey would have undoubtedly found more birds. The majority of the population migrated around the third week of April.

Ruddy Turnstone (Arenaria interpres) is another common migrant that forages in plowed fields as well as in wetlands and intertidal habitat. No. turnstone were recorded on this survey.

Resident Indigenous (Native) Birds:

This category includes only those species which are native but not endemic such as the Black-crowned Night Heron (Nycticorax nycticorax).

Night heron are common around irrigation ponds and along ditches. Twelve heron were counted on the survey. This is the only native, resident waterbird not listed as endangered.

Resident Indigenous (Native) Seabirds:

This site is totally unsuitable for nesting or roosting seabirds. Several species can be seen offshore but would not utilize this property. Ground predators such as dogs, cats, rats and the Small Indian Mongoose (Herpestes auropunctatus) prevent seabirds from nesting on the main Hawaiian Islands in all but a few isolated or protected locations.

Exotic (Introduced) Birds:

A total of 15 species of exotic birds were recorded during the field survey. Table One shows the relative abundance of each species. In addition to these species other exotic birds which potentially could occur on the property include: Common Barn Owl (Tyto alba) and Eurasian Skylark (Alauda arvensis) (Bruner 1981, 1988, 1990; Pratt et al. 1987; Hawaii Audubon Society 1989).

Feral Mammals:

Wild (feral) cats were seen as well as Small Indian Mongoose (Herpestes auropunctatus). No rats or mice were recorded, however,

it would be highly unusual if these ubiquitous animals did not occur on the property. Without a trapping program it is difficult to conclude much about the relative abundance of these species, but it is likely that their numbers do not differ dramatically from similar habitat elsewhere in the region.

Maui records of the endemic and endangered Hawaiian Hoary Bat are sketchy (Tomich 1986; Kepler and Scott 1990). None were observed on this field survey despite two evening searches. This species generally roosts solitarily in trees. Much remains to be known about the natural history of this bat and its ecological requirements here in Hawaii. Kepler and Scott (1990) suggest that this bat occurs on Maui only as a "migrant, probably from the Big Island". Duvall and Duvall (1991) question this idea and suggest that the bat is more common on Maui than reported by Kepler and Scott (1990).

CONCLUSION

A brief field survey can at best provide only a limited perspective of the wildlife present in any given area. Not all species will necessarily be observed and information on their use of the site must be sketched together from brief observations and the available literature. The number of species and the relative abundance of each species may vary

throughout the year due to changing food resources and reproductive success. Species which are migratory will quite obviously be an important part of the faunal picture only at certain times during the year. Exotic species sometimes prosper for a time only to later disapear or become a less significant part of the faunal community (Williams 1987, Moulton et al. 1990). Thus only long term studies can provide an in-dept view of the bird and mammal populations in a particular area. The following are some general conclusions related to bird and mammal activity in the area surveyed.

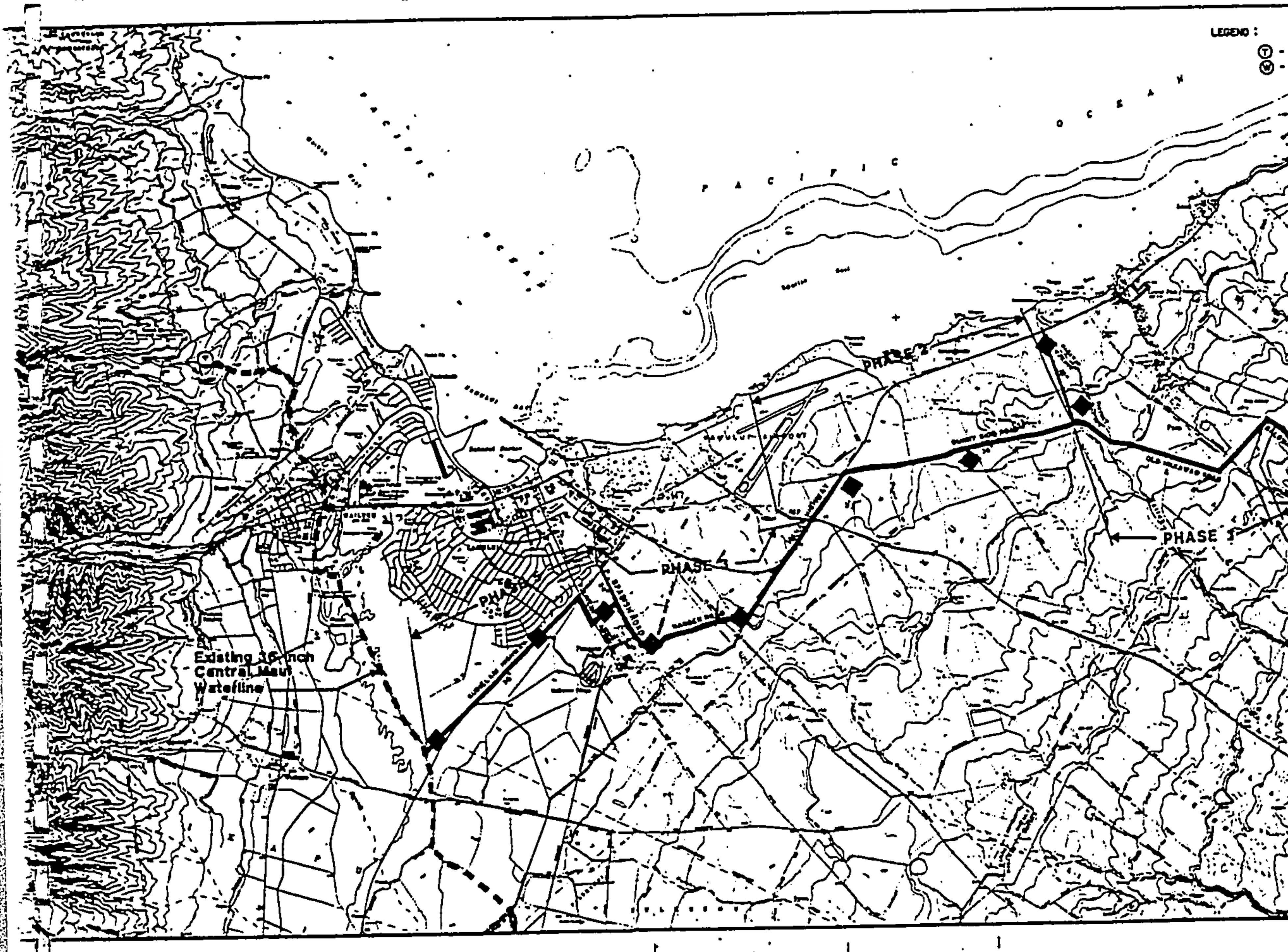
1- The lands involved in this proposal project provide a limited range of habitats which are utilized by the typical array of exotic species of birds one would expect in this region of the island. No unusual concentrations of any exotic species were discovered. However, some species typically found in this area were not recorded. This could have been due to a number of reasons such as: the survey was too brief, their numbers were so low that they went undetected or a combination of these and other factors.

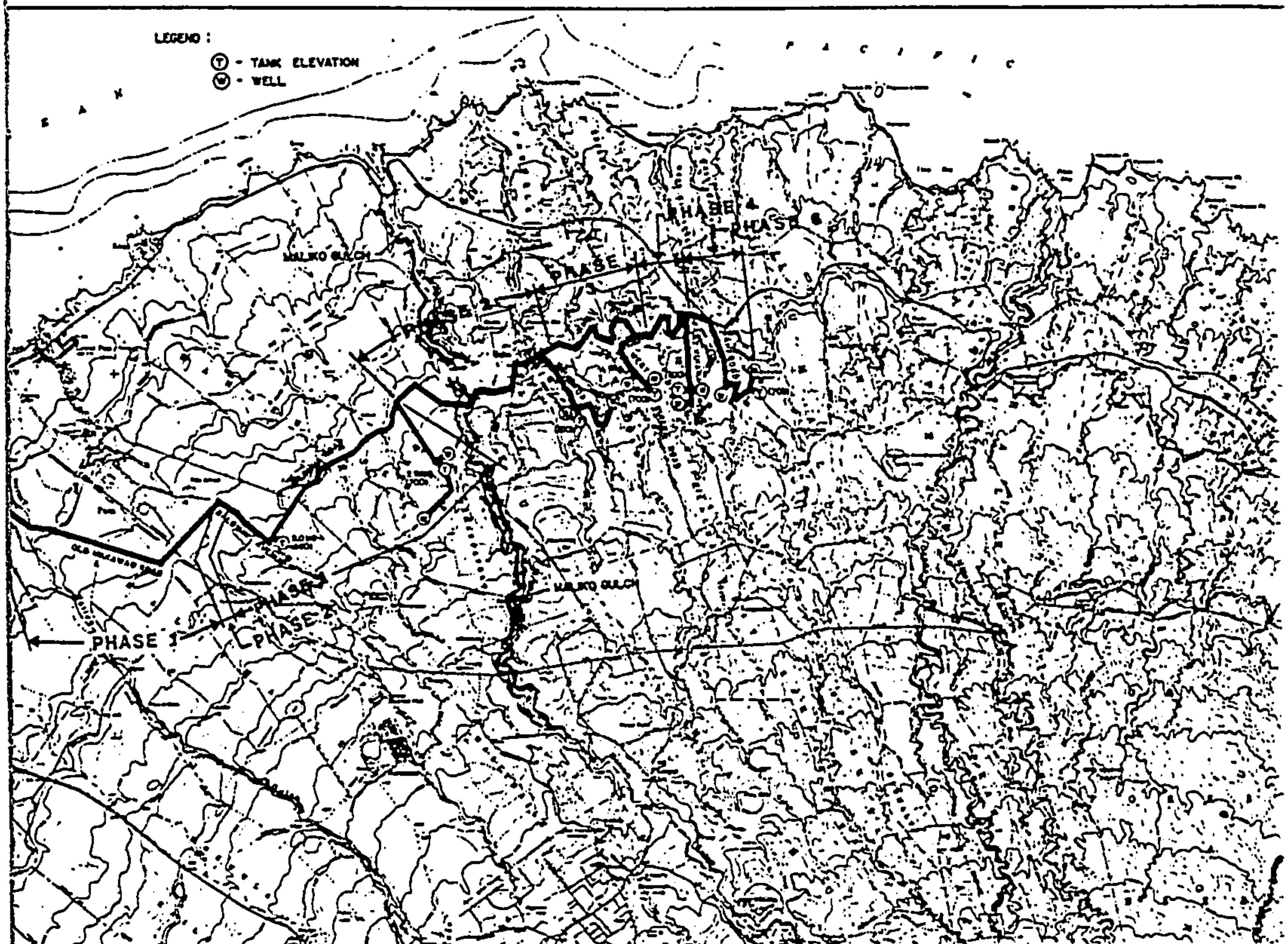
2- The only native birds recorded were the Pacific Golden Plover and Black-crowned Night Heron. The low number of plover was due to time of year (most birds had migrated to the arctic by the third

week of April). Irrigation ditches and reservoirs are attractive foraging habitat for night herons.

3- Data on feral mammals were limited to observations. No unusually large concentrations were noted. No endangered species were recorded. Records of the Hawaiian Hoary Bat on Maui are limited.

4- No particularly unusual or unique habitat for wildlife was found on the survey. Sugarcane lands are common in this sector of the island as are gulches with dense second growth vegetation. The proposed project should have little or no long term measurable effect on the populations of exotic birds on Maui. The scope of the project, likewise, should not pose a serious threat to native birds like plover and night heron.


LEGEND :
PACIFIC
OCEAN
PHASE 2
PHASE 3
Existing 36-inch
Central Maui
Waterline



EAST MAUI WATER DEVELOPMENT PLAN

Location of avifaunal survey with census stations shown as solid diamonds

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2158 MAIN STREET SUITE 203
WAILUKU, MAUI, HAWAII 96732

LOCATION MAP
FIGURE 1

TABLE 1

Exotic species of birds recorded on a survey of lands involved with the proposed East Maui Water Development Project, Maui.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE*
Cattle Egret	Bubulcus ibis	C = 7
Ring-necked Pheasant	Phasianus colchicus	R = 3
Black Francolin	Francolinus francolinus	U = 4
Gray Francolin	Francolinus pondicerianus	C = 8
Spotted Dove	Streptopelia chinensis	C = 7
Zebra Dove	Geopelia striata	A =13
Common Myna	Acridotheres tristis	A =15
Northern Mockingbird	Mimus polyglottus	R = 2
Northern Cardinal	Cardinalis cardinalis	C = 6
Red-crested Cardinal	Paroaria coronata	R = 2
Hwamei	Garrulax canorus	C = 6
Japanese White-eye	Zosterops japonicus	A =14
Nutmeg Mannikin	Lonchura punctulata	A =15
House Finch	Carpodacus mexicanus	C = 9
House Sparrow	Passer domesticus	C = 7

(see page 13 for key to symbols)

KEY TO TABLE 1

Relative abundance = number of times observed during survey or frequency on eight minute counts in appropriate habitat.

A = abundant (ave. 10+)

C = common (ave. 5-10)

U = uncommon (ave. less than 5)

R = recorded (seen or heard at times other than on 8 min. counts. number which follows is the total individuals seen or heard).

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