Makena Resort WW
Reclamation System

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RECEIVED

May 22, 1998

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OFC. OF ENVIL.
QUALITY CONTROL

Mr. Gary Gill, Director
Office of Environmental Quality Control
State Office Tower, Room 702
235 South Beretania Street
Honolulu, Hawaii 96813-2437

Dear Mr. Gill:

RE: Final Environmental Assessment (EA) for Makena Resort's Wastewater Reclamation System at TMK: 2-1-05:108; 2-1-08:108; 2-1-05:86 and 120; 2-1-07:68, Makena, Island of Maui, Hawaii (EA 980001)

The Maui County Planning Department (Department), as the accepting authority, is transmitting for publication in the upcoming Office of Environmental Quality Control (OEQC) Bulletin the Final Environmental Assessment in which a Finding of No Significant Impact (FONSI) has been determined for the Makena Resort's Wastewater Reclamation System. ✓

A description of the proposed action is attached to the OEQC Bulletin Publication Form and will also be sent by electronic mail (E-Mail) by the Applicant to OEQC in a WordPerfect format. In addition, the Department has enclosed four (4) copies of the Final Environmental Assessment Report (prepared by the Applicant).

Thank you for your cooperation. If additional clarification is required, please contact Ms. Ann T. Cua, Staff Planner, of this office at 243-7735.

Very truly yours,

DAVID W. BLANE
Director of Planning

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
PLANNING DIVISION (808) 243-7735; ZONING DIVISION (808) 243-7253; FACSIMILE (808) 243-7634

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DWB:ATC:osy
Enclosures
c: Clayton Yoshida, AICP, Planning Program Administrator
Ann T. Cua, Staff Planner
Roy Figueiroa (Makena Resort)
Colette Sakoda (R. M. Towill Corporation)
Project File
General File
(s:\all\ann\makenfon.si)

1998-06-08-MA-FEA-Makena Resort

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FINAL ENVIRONMENTAL ASSESSMENT

Wastewater Reclamation System

MAKENA RESORT
WASTEWATER RECLAMATION SYSTEM

Makena, Maui, Hawaii

MAY 1998

PREPARED FOR:
Makena Resort Corp.
Kihei, Maui

RMTC

R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941
842-1133 Fax: 842-1937

ENVIRONMENTAL ASSESSMENT

FOR THE

MAKENA RESORT

WASTEWATER RECLAMATION SYSTEM

Prepared for:

Makena Resort Corp.
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MAY 1998

Prepared By:

R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

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SECTION 1
Project Summary

Project:	Makena Wastewater Reclamation System
Project Location:	Makena, Makawao District, Island of Maui
Applicant:	Makena Resort Corp. and Eric T. Maehara 5415 Makena Alanui Kihei, Maui, Hawaii 96753 Contact: Roy Figueiroa Telephone: (808) 879-4455
Agent:	R. M. Towill Corporation 420 Waiakamilo Road, Suite 411 Honolulu, Hawaii 96817-4941 Contact: Colette M. Sakoda Telephone: (808) 842-1133
Tax Map Keys:	2-1-05:108 & 120 2-1-07:68 2-1-08:108
Land Owner:	Ainamua Corp. Maui Prince Hotel Corp. Makena Aina Corp. County of Maui
State Land Use Designation:	Agriculture and Urban
Kihei-Makena Community Plan Designation:	MF - Multi-Family Residential B - Business/Commercial PK - Park P - Public/Quasi-Public H - Hotel
Zoning Designation:	R2 - Residential A2 - Apartment HM - Hotel Medium GC&OS - Golf Course and Open Space BR - Resort Commercial

SECTION 2
Introduction

2.1 PURPOSE AND NEED FOR ACTION

Affiliates of the Makena Resort Corp. (MRC) own approximately 1,800 acres in the Makena area on the southwest coast of the Island of Maui (**Figure 2-1**). Presently 433 acres of the resort are being utilized for two 18 hole golf courses, tennis courts, and support facilities. Approximately 24 acres constitute the Maui Prince Hotel grounds. The remaining lands will be developed for single family, multi-family and business properties and hotel (**Figure 2-2**).

MRC proposes to develop a wastewater reclamation system to meet the projected infrastructure demands of the Makena Resort Development. An existing wastewater treatment facility serves the Maui Prince Hotel but it does not have the capacity to provide service for future resort development. The proposed project will provide sufficient capacity for the entire Makena Resort Development.

The Seibu Makena Master Plan Environmental Impact Statement accepted by the County of Maui Planning Commission in 1975, as part of the Kihei General Plan Amendment, contains information describing and evaluating the impacts of the overall Makena Resort development. Subsequently, it was understood that as specific aspects of the overall resort development project such as the wastewater reclamation facility and system were proposed, each would be described and evaluated through detailed environmental analyses. Thus, an environmental assessment (EA) focusing specifically on the impacts and mitigative measures for the wastewater reclamation system project has been prepared in accordance with Chapter 343, HRS, as amended, and the administrative rules of the Office of Environmental Quality Control. It serves as a supporting document for four County of Maui permit applications – Special Management Area Permit (SMAP), the State Special Use Permit (SUP), Conditional Permit (CP), and the County Special Use Permit (CUP) necessary to implement this project.

The project will not substantially affect size, scope, intensity, use, or location of the entire development described in the aforementioned EIS. The overall development scope of the project has substantially been reduced from a total of 5,969 units to 3,600 units (Table 2-1). Therefore, the magnitude of the impacts will be smaller than previously addressed in the 1975 EIS. There are no new circumstances or evidence brought to light that differ or will result in increased environmental impacts not previously dealt with. The mitigating measures originally proposed will continue to be enforced. Therefore, based on the requirements of the EIS rules (Sections 11-200-26 to 29 of HAR), it is determined that a supplemental EIS will not be necessary.

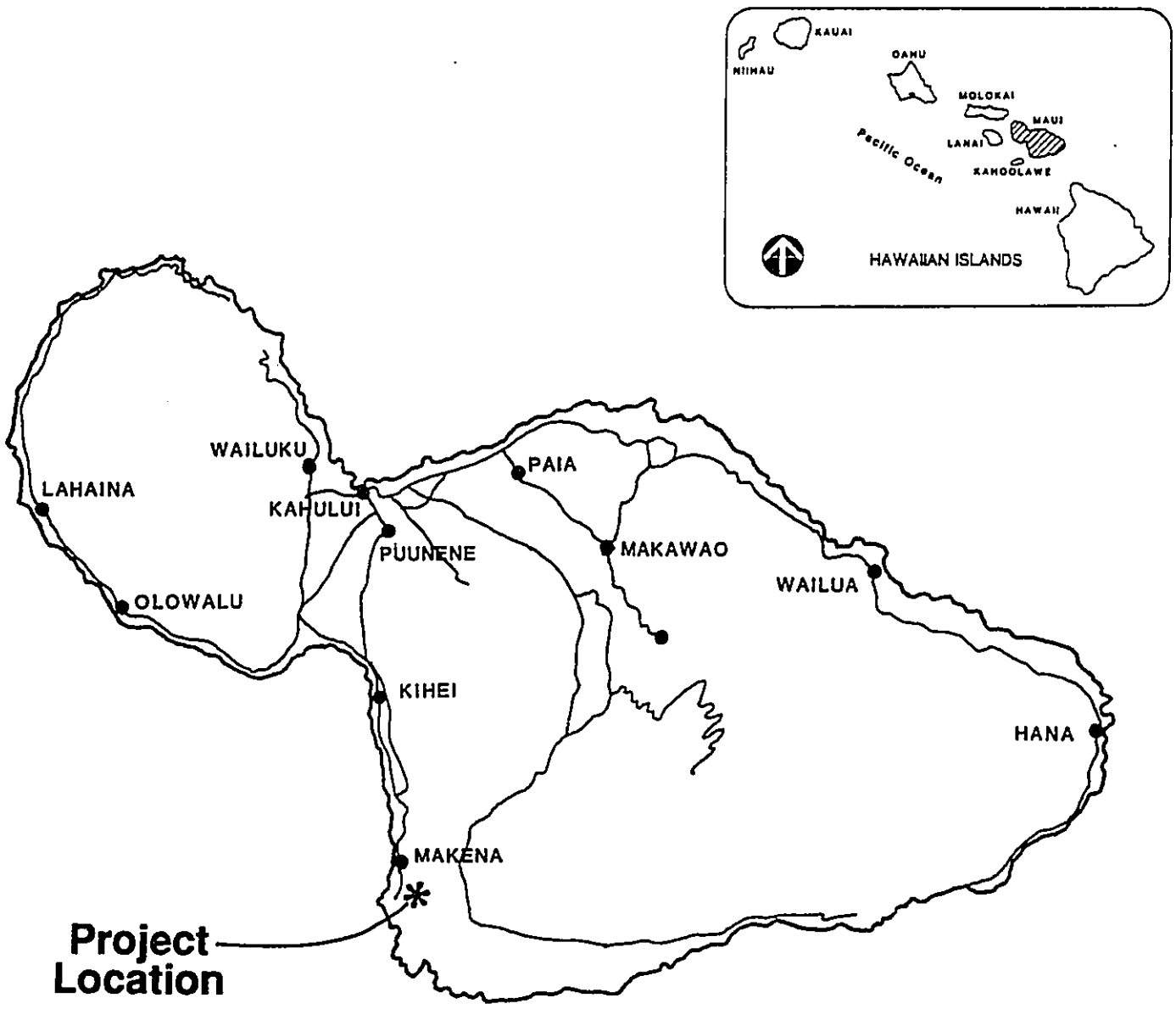

FIGURE 2-1
LOCATION MAP
Makena Resort
Wastewater Reclamation System

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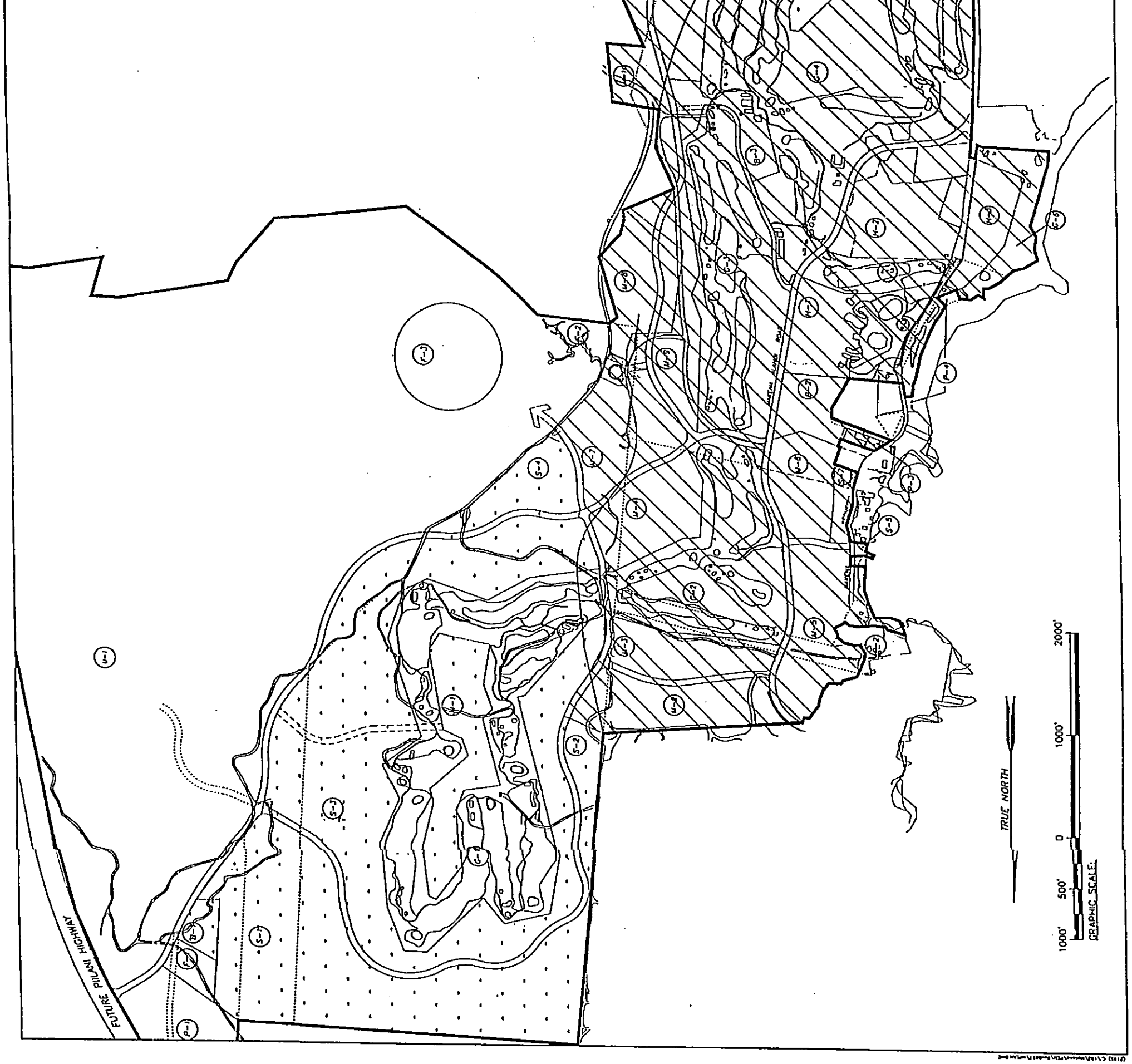
MAY 1998


FUTURE PILANI HIGHWAY
TRUE NORTH
GRAPHIC SCALE:
1000'
500'
0
1000'
2000'

LAND USE	PARCEL	AREA
HOTEL		
	H-1	28.850
	H-2	27.388
	H-3	9.287
	SUBTOTAL	65.325
BUSINESS		
	B-1	3.868
	B-2	9.441
	B-3	8.900
	SUBTOTAL	22.209
MULTI-FAMILY		
	M-1	22.420
	M-2	21.095
	M-3	15.181
	M-4	18.583
	M-5	22.376
	M-6	13.415
	M-7	21.489
	M-8	15.116
	M-9	17.818
	M-10	20.880
	M-11	13.676
	M-12	19.084
	SUBTOTAL	220.935
SINGLE FAMILY		
	S-1	93.714
	S-2	7.70
	S-3	128.602
	S-4	13.184
	S-5	0.420
	S-6	106.831
	S-7	6.174
	SUBTOTAL	356.425
	SUBTOTAL	663.084
TOTAL = 1868.971 ACRES		

LAND USE	PARCEL		AREA
GOLF COURSE			
	G-1		97.787
	G-2		49.818
	G-3		31.329
	G-4		147.699
	G-5		66.714
	G-6		10.674
	G-7		9.297
	SUBTOTAL		433.318
PARK			
	P-1		24.811
	P-2		1.253
	P-3		0.407
	P-4		0.750
	P-5		2.174
	SUBTOTAL		29.895
PUBLIC/ QUASI PUBLIC FACILITY			
	F-1		4.034
	F-2		1.354
	F-3		20.000
	SUBTOTAL		25.388
FUTURE EXPANSION			
	U-1		623.314
EXCLUSIONS			
LOT	3-4-1-B		3.000
LOT	3-4-1-C		5.000
LOT	3-4-1-D		0.871
	SUBTOTAL		8.871
PILANI HIGHWAY ROADS	EXTENSION		45.494
			36.909
	SUBTOTAL		82.403
	SUBTOTAL		1194.318

MRC Property Line

Increment I

Boundary

Increment II

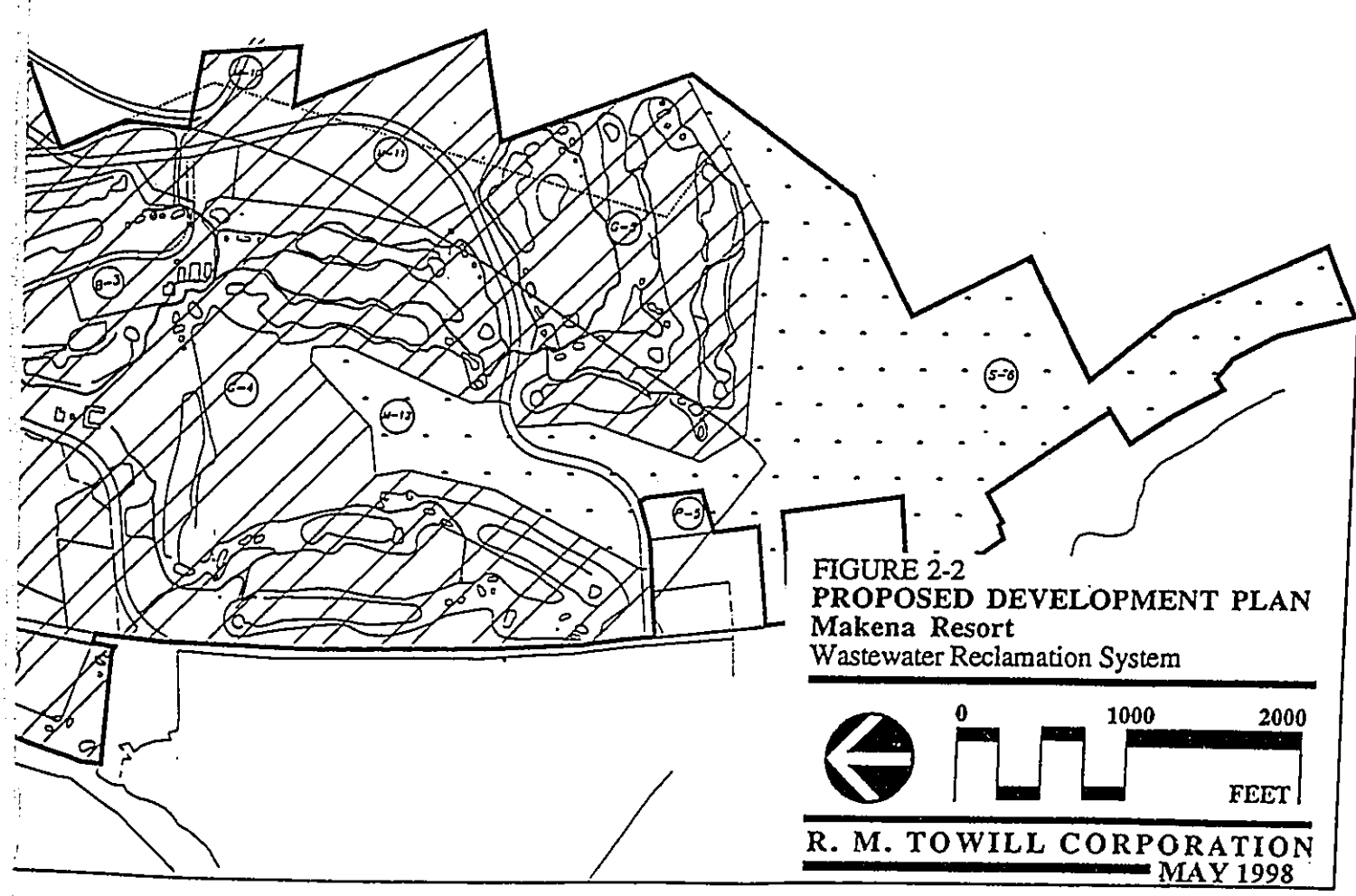


FIGURE 2-2
PROPOSED DEVELOPMENT PLAN
Makena Resort
Wastewater Reclamation System

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Table 2-1 Proposed Development

TYPE	PREVIOUS DEVELOPMENT SCOPE (1975 EIS)	CURRENT DEVELOPMENT SCOPE
	Dwelling Units	Dwelling Units
Hotel Rooms	1,200 rooms	900 rooms
Multiple Dwelling Unit	4,292 units	1,300 units
Single Dwelling Unit	477 units	1,400 units
Total Units	**5,969 units**	**3,600 units**

This EA contains an evaluation of impacts expected from the addition of an on-site wastewater reclamation system. Appropriate mitigation measures are proposed. A final detailed "Basis of Design and Engineering Design Report," R. M. Towill Corporation, September 1997, has been prepared for the project and serves as reference under separate cover.

SECTION 3
Project Description and Background

3.1 PROJECT LOCATION

The proposed Makena Wastewater Reclamation System (MWRS) is located in the Makena Resort on the southwest coast of the Island of Maui (**Figure 2-1**). Makena Resort is accessible from the Wailuku-Kahului area via Piilani Highway and Makena Alanui Road.

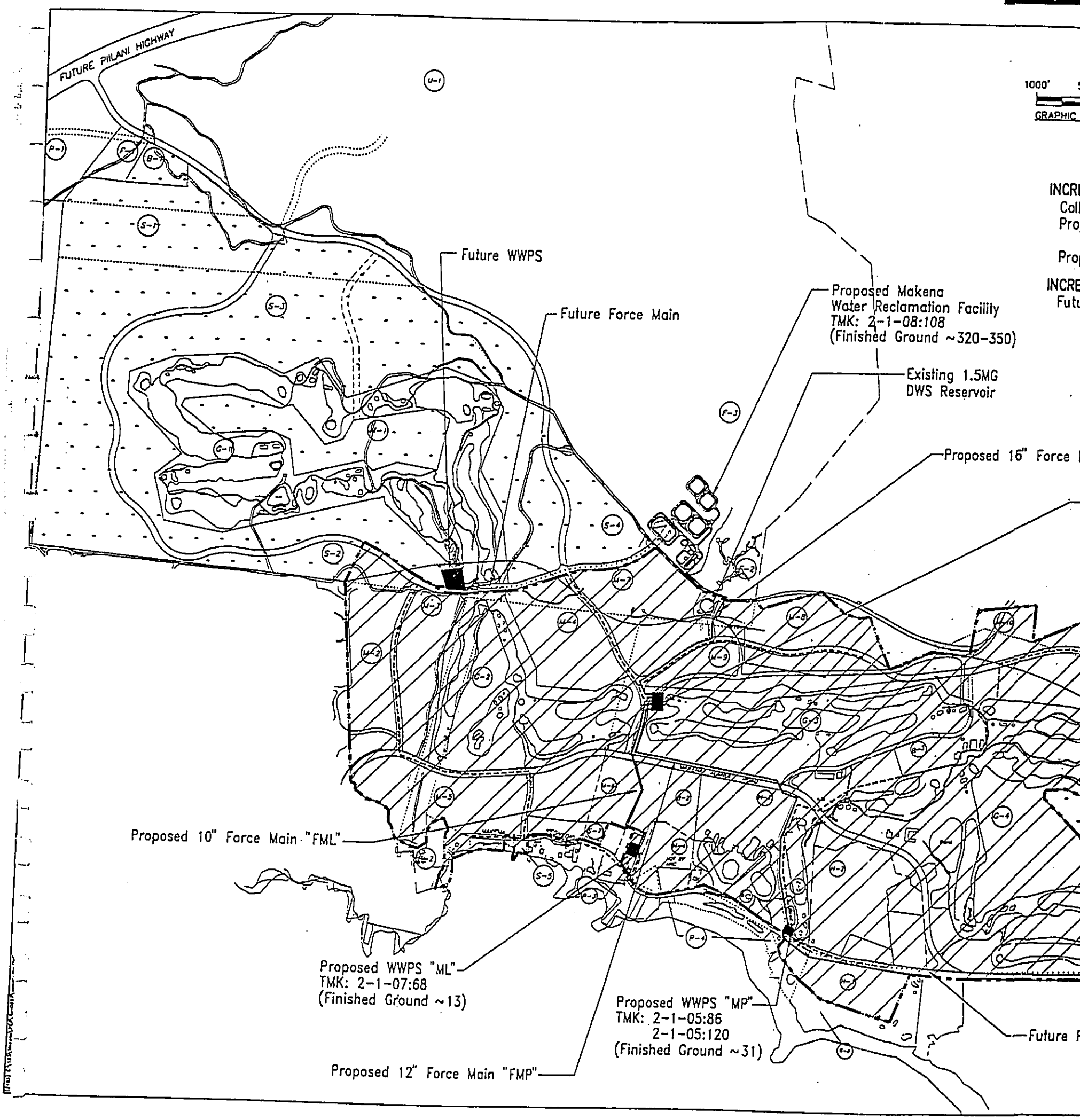
3.2 PROJECT DESCRIPTION

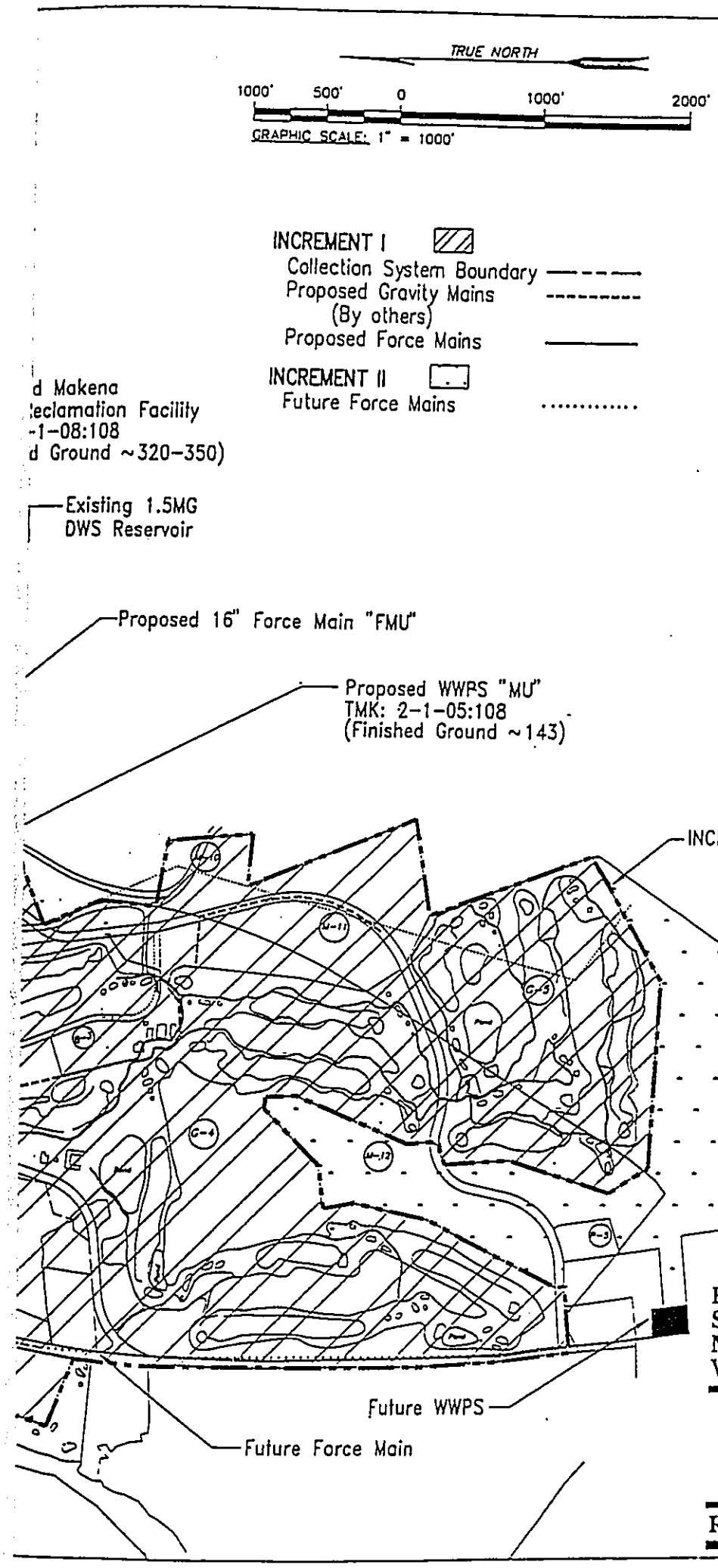
MRC proposes to develop a wastewater reclamation system to meet the wastewater infrastructure demands of the planned development of Makena Resort. Development of the Makena Resort will be conducted in two major increments. The sewer master plan in **Figure 3-1** illustrates both the first increment and the ultimate development of the sewer infrastructure. The proposed wastewater reclamation system includes a gravity collection system, three wastewater pump stations and force mains, a water reclamation facility, and an effluent disposal system. The components of the wastewater system are designed to accommodate the projected Increment 1 flows with the capability of expansion to accommodate Increment 2 flows.

The MWRS will be a privately owned facility. The system will be operated and maintained by MRC or its designee. The primary effluent disposal method for the MWRS will be reuse through irrigation of golf courses. The back-up disposal method will be subsurface disposal. The back-up disposal method will only be used when wastewater effluent quantities exceed irrigation requirements, the irrigation system is not in operation, or the wastewater effluent does not meet the reuse criteria.

The Makena area is predominantly served by cesspools, and although the systems have been operating adequately, it is apparent that a wastewater treatment facility would greatly reduce any potential environmental and public health risks. Presently, there are no publicly owned treatment works in operation in the area. The Maui Prince Hotel, located on the grounds of the Makena Resort, is served by a privately owned individual wastewater system. The existing Makena wastewater treatment system does not have the capacity to connect other public facilities.

The Maui Prince Hotel wastewater treatment facility is an activated sludge plant with chlorine disinfection. The treatment plant is located on the southern, makai end of the hotel. Effluent from the treatment plant is discharged into a lined reservoir adjacent to the site. The reclaimed water is then pumped up to a larger reservoir within the golf course irrigation system, mixed with nonpotable groundwater from nearby wells, and used to irrigate portions of the North and South courses.


FUTURE PIILANI HIGHWAY
Future WWPS
Future Force Main
Proposed Makena
Water Reclamation Facility
TMK: 2-1-08:108
(Finished Ground ~320-350)
Existing 1.5MG
DWS Reservoir
Proposed 16" Force
Proposed 10" Force Main "FML"
Proposed WWPS "ML"
TMK: 2-1-07:68
(Finished Ground ~13)
Proposed WWPS "MP"
TMK: 2-1-05:86
2-1-05:120
(Finished Ground ~31)
Proposed 12" Force Main "FMP"
Future
1000'
GRAPHIC



LAND USE	PARCEL	AREA
HOTEL		
	H-1	28.830
	H-2	27.388
	H-3	9.787
	SUBTOTAL	65.375
BUSINESS		
	B-1	3.868
	B-2	9.441
	B-3	8.900
	SUBTOTAL	22.209
MULTI-FAMILY		
	M-1	22.420
	M-2	21.093
	M-3	15.161
	M-4	18.583
	M-5	22.376
	M-6	13.445
	M-7	21.469
	M-8	15.116
	M-9	17.618
	M-10	20.890
	M-11	13.676
	M-12	19.086
	SUBTOTAL	220.925
SINGLE FAMILY		
	S-1	93.714
	S-2	7.70
	S-3	128.602
	S-4	15.184
	S-5	0.420
	S-6	106.631
	S-7	4.174
	SUBTOTAL	356.425
	SUBTOTAL	685.084
TOTAL = 1868.971 ACRES		

LAND USE	PARCEL	AREA
GOLF COURSE		
	G-1	97.787
	G-2	49.816
	G-3	51.229
	G-4	147.699
	G-5	66.714
	G-6	10.674
	G-7	9.397
	SUBTOTAL	433.216
PARK		
	P-1	24.811
	P-2	1.753
	P-3	0.407
	P-4	0.750
	P-5	2.174
	SUBTOTAL	29.895
PUBLIC/ QUASI PUBLIC FACILITY		
	F-1	4.034
	F-2	1.354
	F-3	20.000
	SUBTOTAL	25.388
FUTURE EXPANSION		
	POR. LOT-2	623.314
EXCLUSIONS		
	LOT J-A-1-B	2.000
	LOT J-A-1-C	6.000
	LOT J-A-1-D	0.671
	SUBTOTAL	9.671
PIILANI HIGHWAY ROADS	EXTENSION	45.494
		36.909
	SUBTOTAL	82.403
	SUBTOTAL	1194.216

FIGURE 3-1
SEWER MASTER PLAN
Makena Resort
Wastewater Reclamation System

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MAY 1998

The Maui Prince Hotel wastewater treatment facility has a design average flow capacity of 123,000 gallons per day (gpd). Flow data from summer 1996 to winter 1997 shows that the facility currently treats an average flow of 76,500 gpd, with over 90 percent occupancy at the hotel. Although there is available capacity at the existing facility (about 47,000 gpd), it is not enough to accommodate the proposed development within the Makena Resort. An expanded or new, larger capacity treatment facility is required.

The following is a description of the collection, treatment, and disposal components of the MWRS.

3.2.1 Wastewater Pump Stations (WWPS)

Based on the proposed Increment 1 development of the Makena Resort, it has been determined that three pump stations are required to transport wastewater to the reclamation facility site. Contingent upon future parcel layouts and grading, some subdivisions of the resort development may require pumping of the wastewater to the trunk line.

The locations of the three proposed pump stations are shown in **Figure 3-1** and described as follows:

WWPS "ML" (Makena Lower)

The proposed site for "ML" is the area adjacent to and mauka of the existing public comfort station across Keawalai Church.

WWPS "MP" (Maui Prince)

WWPS "MP" is located just makai of the Maui Prince Hotel's existing wastewater treatment facility. This location is the natural low point in the area and will allow continued use of the existing Maui Prince sewer lines as well as servicing future hotel developments on adjacent properties.

WWPS "MU" (Makena Upper)

Pump station "MU" will serve as the major junction for wastewater flows from the Increment 1 developments. Based on flow and total dynamic head requirements for the two lower pump stations and those necessary to transport the wastewater from this pump station up to the proposed reclamation facility (elevation 320-350 feet), the pump station is situated near elevation 140-145 feet.

The pump station sites and structures will be sized for pumping facilities capable of handling the projected ultimate flows for the proposed development. Smaller pumps and auxiliary equipment will be installed initially for Increment 1 flows. These units will be replaced with larger units in the future to accommodate Increment 2 wastewater flows. Pump station design flows for Increment 1 are as follows:

WWPS "ML"

Average design daily flow:	0.22 mgd	(153 gpm)
Design maximum day flow:	0.89 mgd	(618 gpm)
Design peak flow:	1.02 mgd	(708 gpm)

WWPS "MP"

Average design daily flow:	0.36 mgd	(250 gpm)
Design maximum day flow:	1.38 mgd	(958 gpm)
Design peak flow:	1.53 mgd	(1062 gpm)

WWPS "MU"

Average design daily flow:	0.72 mgd	(500 gpm)
Design maximum day flow:	2.40 mgd	(1667 gpm)
Design peak flow:	2.78 mgd	(1930 gpm)

To help minimize potential adverse impacts on the aesthetics of the area, consideration was given to the following with regards to the pump station facility sizing and layout:

- Effective architectural and landscaping schemes
- Utilizing below grade pump stations and underground fuel tanks
- Minimizing the size of the generator building and miscellaneous structures
- Noise attenuation for the generator building
- Provision of an odor control system
- Siting the pump stations along existing gradients to minimize grading

Preliminary site layouts for the proposed pump stations are shown in **Figures 3-2**, **3-3**, **3-4** and **3-5**. The sites range in area from approximately 9,000 square feet for WWPS "ML" to roughly 7,000 square feet for both "MP" and "MU". The site plans utilize existing easements, driveways, or roads, for entrance into the facilities. There will be a sufficient space within the each site to accommodate service vehicle parking and loading activities. During the construction phase, temporary access roads and parking areas will be provided for all pump stations.

Prefabricated dry-pit type pump stations will be used. A typical unit is shown in **Figure 3-5**. As illustrated, the bulk of the structure is below grade with a manhole to the dry pit extending above ground. Pumps used in all of the proposed stations will be of the non-clog vertical dry-pit variety designed to convey raw sewage.

Each pump station will be supplied with a diesel emergency generator capable of automatically providing backup power during a commercial power outage. The generators will be located above ground for efficient and easy access by operation and maintenance personnel. A 110 horsepower (HP), 200 KW generator is needed for WWPS "ML", a 150 HP, 300 KW generator for WWPS "MP", and a 250 HP, 350 KW generator for WWPS "MU". The diesel fuel storage tank will be placed underground to address aesthetic and safety concerns. All Federal underground storage

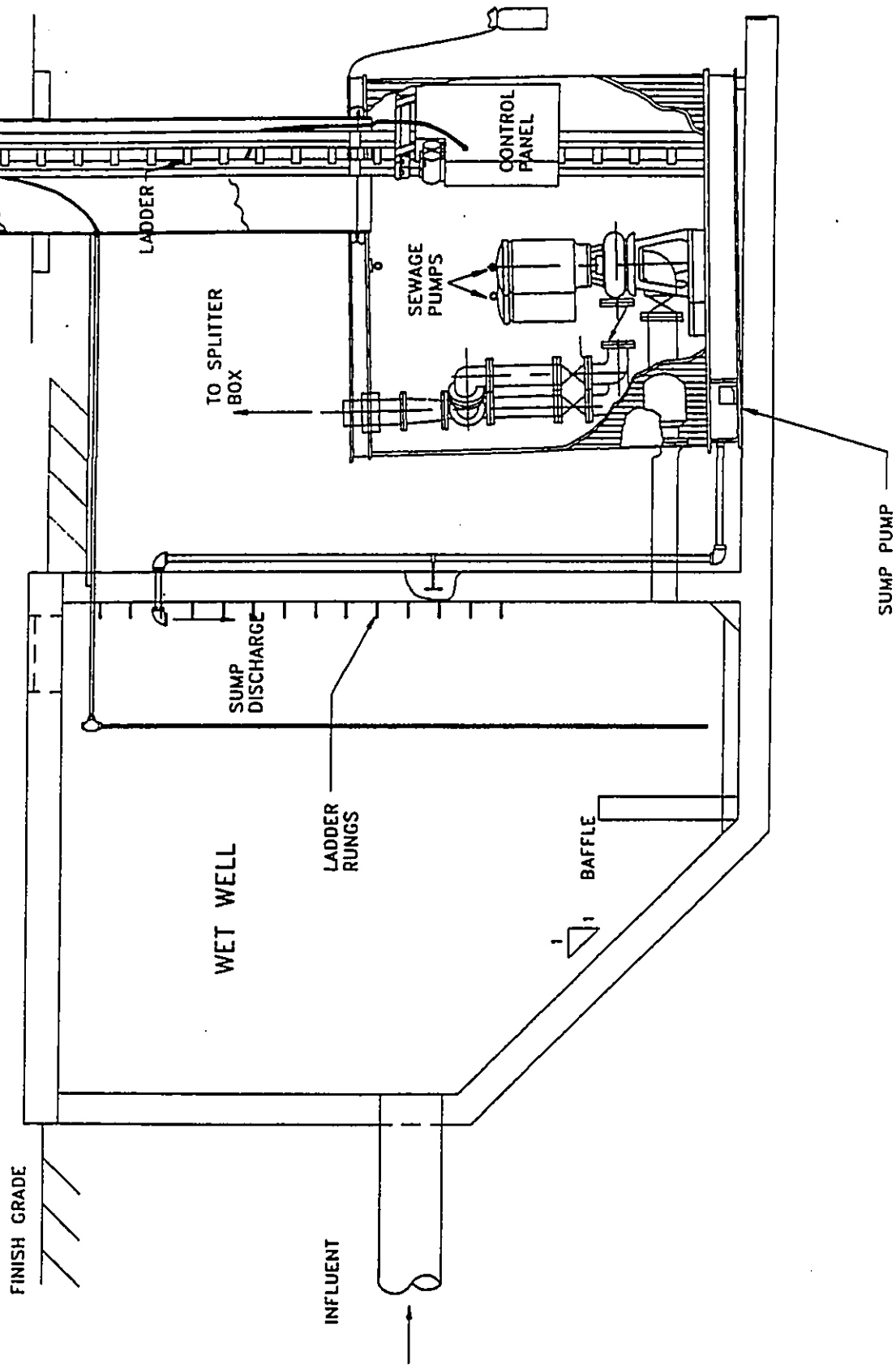

FIGURE 3-2
TYPICAL DRY PIT PUMP STATION
Makena Resort
Wastewater Reclamation System

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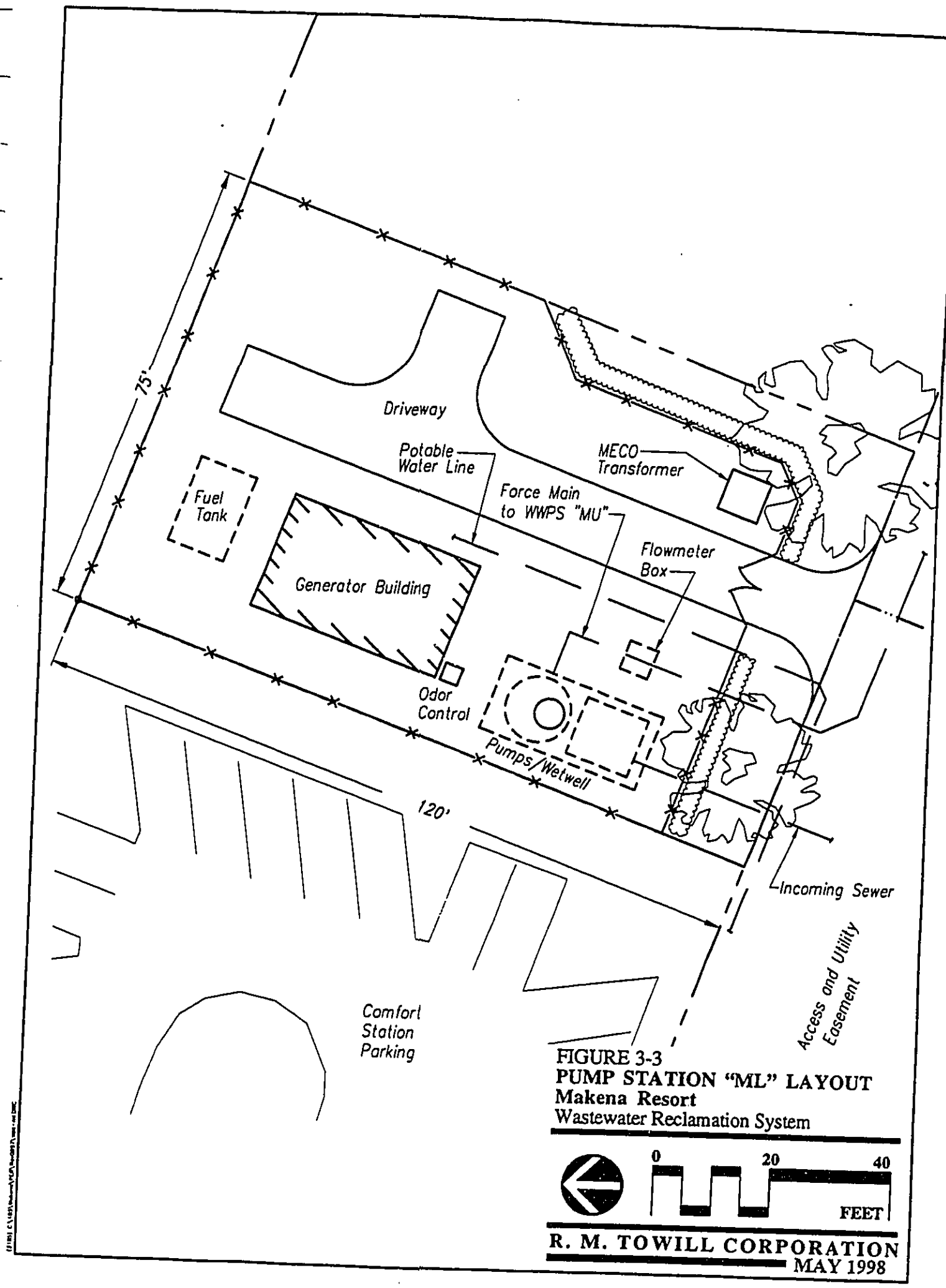

FIGURE 3-3
PUMP STATION "ML" LAYOUT
Makena Resort
Wastewater Reclamation System

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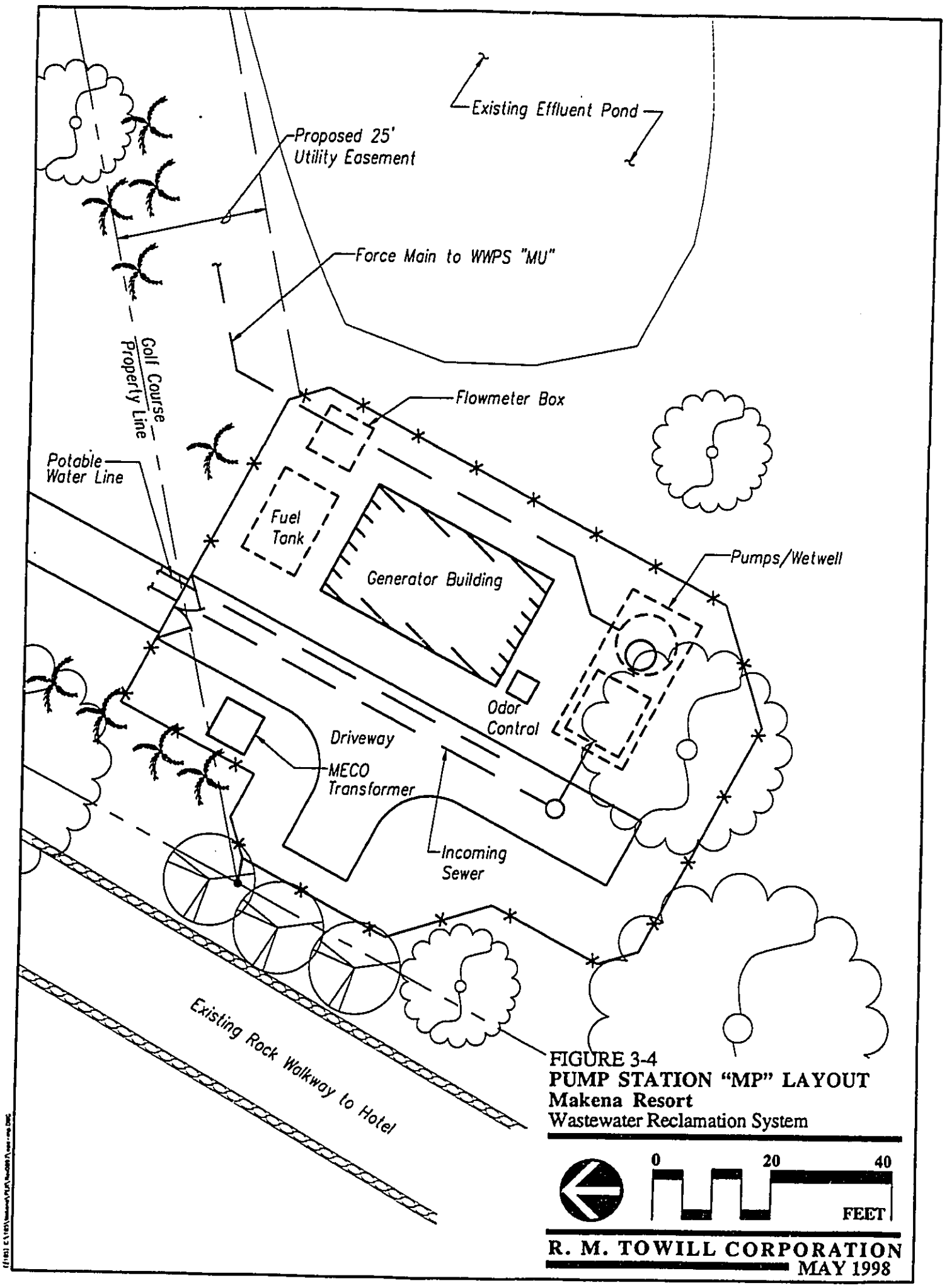

FIGURE 3-4
PUMP STATION "MP" LAYOUT
Makena Resort
Wastewater Reclamation System

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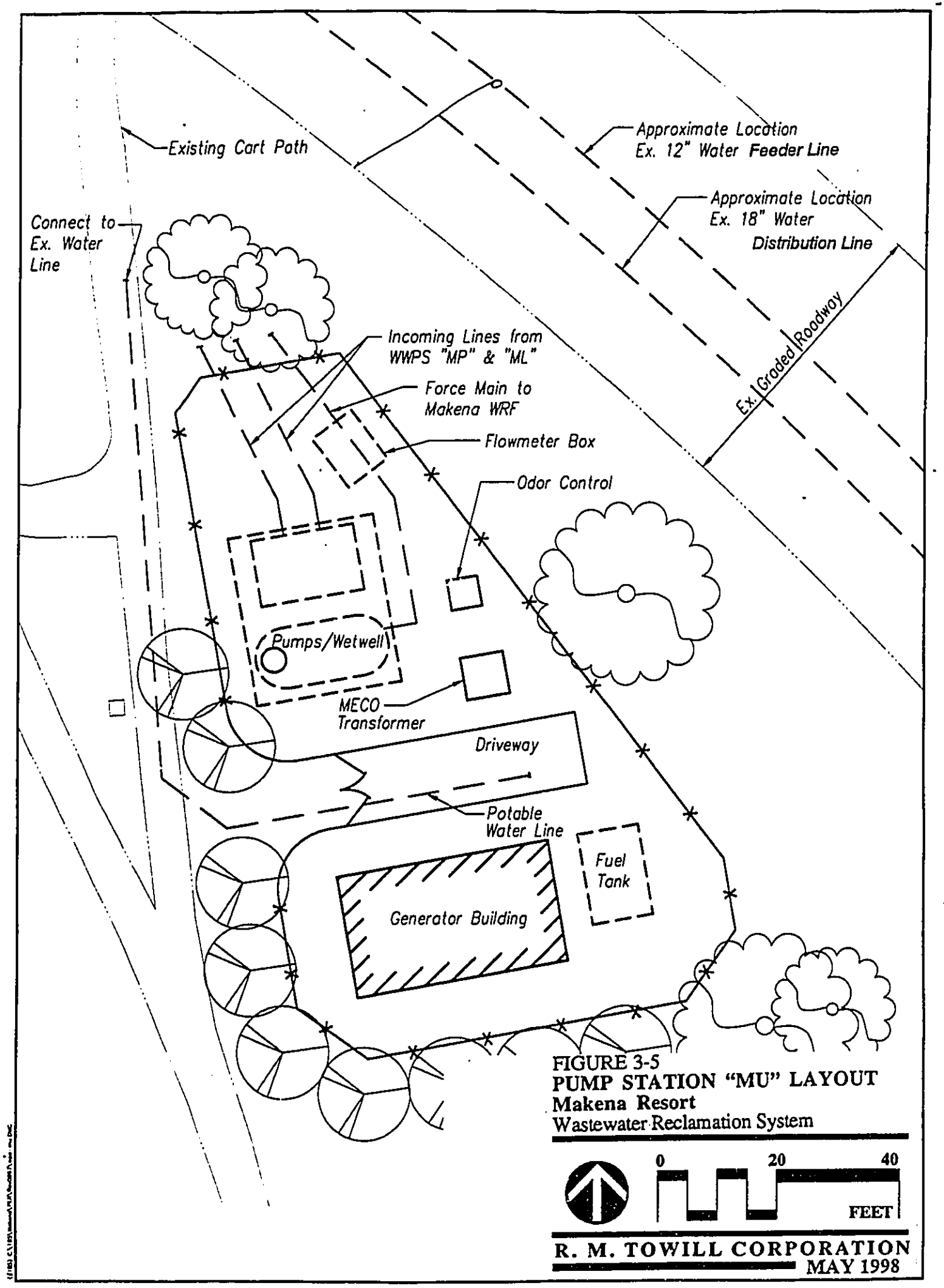


FIGURE 3-5
PUMP STATION "MU" LAYOUT
Makena Resort
Wastewater Reclamation System

R. M. TOWILL CORPORATION
MAY 1998

tank (UST) guidelines will be satisfied including corrosion protection, spill/overfill protection, and leak detection monitoring.

Potable water will be provided to the wastewater pump stations for physical washing, facility washdown, landscape irrigation, and other maintenance purposes. The main water supplies to the facilities will be two inch laterals off the existing County water system. The lines will be metered and a master shut-off valve, located within the pump station perimeter fence, will be furnished. To protect the potable water system, backflow preventers shall be provided and located within the perimeter fence. Potable water to WWPS "ML" will be provided by a tap off of the existing 8-inch water main in Makena Keoneoio Road. The nearest potable water source for WWPS "MP" is the existing Maui Prince Hotel Wastewater Treatment Plant, approximately 150 feet northeast of the site. Potable water for WWPS "MU" will be supplied from the nearby 12-inch high pressure transmission line.

3.2.2 Force Mains

Ease of installation and repair, and minimization of local high points were the primary considerations in the selection of the force main alignments,. For ease of maintenance and repair, the force mains are proposed to be located within or along roadways. Pipe material will be high density polyethylene (HDPE), 130 psi, SDR 13.5. The force mains for the Makena wastewater transmission system are as follows:

WWPS "ML" to "MU"	10 inch nominal dia.	~1,750 LF
WWPS "MP" to "MU"	12 inch nominal dia.	~3,600 LF
WWPS "MU" to MWRF	16 inch nominal dia.	~2,300 LF

3.2.3 Makena Wastewater Reclamation Facility (MWRF)

The site of the MWRF, as identified in **Figure 3-1**, encompasses an area of approximately 13 acres. The proposed site is located toward the eastern boundary of the Makena Resort area, bounded on all sides by the undeveloped land. The gentle slope and configuration of the site is appropriate for the proposed lagoon based system.

The initial plant increment will accommodate an average daily flow of 0.7 million gallons per day. The plant will be designed for expansion to allow treatment of an average daily flow of 1.5 million gallons per day.

Conditions at the Makena Resort imply that reuse of wastewater requires the highest degree of treatment; compliance with State DOH R-1 effluent requirements. There are three classifications of reclaimed water, and R-3 has the lowest level of treatment. The State DOH definition of R-1 water is reclaimed water that is at all times oxidized (treated to secondary levels), then filtered, and then disinfected. State DOH requirements for subsurface disposal indicate disinfected secondary effluent. The treatment process consists of the following steps:

- **Screening.** Removes large materials, rags, branches, grease balls, etc.

- **Grit Removal.** Removes heavy material such as sand, rocks, etc.
- **Aeration.** Lagoons will be used to reduce organics in the wastewater.
- **Clarification.** Separates, by gravity, the solid matter from the treated wastewater.
- **Filtration.** Filters out any remaining solids leaving the aerated lagoons, including algae. The addition of chemicals prior to the filtration process is required to help remove the remaining solids.
- **Disinfection.** Ultraviolet light disinfection is used to inactivate disease causing microorganisms.

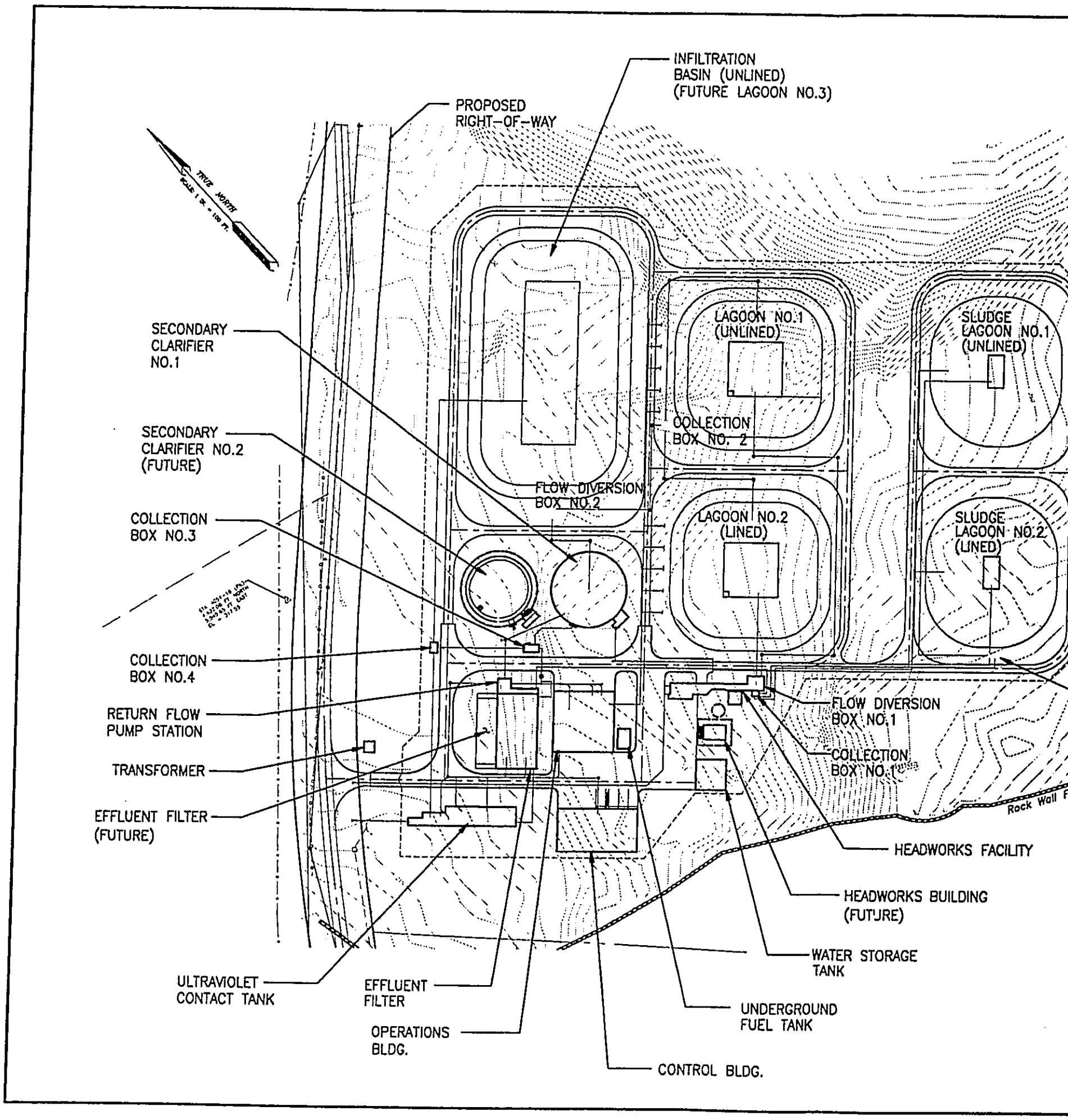
A site plan of the proposed MWRF is presented in **Figure 3-6**. The facility will be comprised of a headworks facility, two aerated lagoons, a secondary clarifier, an effluent filter, an ultraviolet contact tank, an infiltration basin, an operations building, a control building, and system equipment such as pipes and blowers. Preliminary layouts of the operations and control buildings are shown *in* **Figures 3-7** *and* **3-8,** *respectively.*

The proposed water reclamation facility is a lagoon based system. The aerated lagoons will be lined and have operating volumes of 1 million gallons each. Total depth of each lagoon will be 18 feet. The infiltration basin will be unlined and provide back-up disposal for the wastewater system. The infiltration basin will be lined during the second plant increment to provide an additional 2 million gallons of aerated lagoon volume to accommodate projected flow increases. The multiple lagoon setup provides redundancy and maximum operational flexibility to allow operators to respond to changing conditions.

The plant will be supplied with a diesel emergency generator (500 KW) capable of automatically providing backup power during a commercial power outage. The major equipment for the treatment processes will be connected to the emergency power system. An aboveground, concrete encased, diesel fuel storage tank will allow the generator to run for approximately three days at full load.

The sludge resulting from the wastewater treatment operation will be discharged to sludge lagoons. The sludge lagoons will provide long-term storage and continued stabilization of the solids with minimal odor and groundwater contamination risks. Two sludge lagoons will be provided. Storage times in the sludge lagoons will range from about eight (8) years under initial flow conditions to one (1) year at full plant capacity. Each lagoon can hold approximately 85 dry tons of solids. Removal of lagoon sludge will consist of taking the lagoon out of service for at least 30 days, dredging or pumping the sludge from the lagoon, dewatering the sludge either on-site or at other facility, and hauling for disposal. Solids removed from the sludge lagoon are expected to be stable and not harmful. Sludge will be discharged to an alternate lagoon when a lagoon is being emptied.

The sludge removed from the facility will be hauled to either a county landfill or a composting facility. Sludge disposal shall be in accordance with the County Landfill Guidelines or as directed


INFILTRATION
BASIN (UNLINED)
(FUTURE LAGOON NO.3)
PROPOSED
RIGHT-OF-WAY
TRUE NORTH
SCALE 1 IN. = 100 FT.
SECONDARY
CLARIFIER
NO.1
SECONDARY
CLARIFIER NO.2
(FUTURE)
COLLECTION
BOX NO.3
COLLECTION
BOX NO.4
RETURN FLOW
PUMP STATION
TRANSFORMER
EFFLUENT FILTER
(FUTURE)
LAGOON NO.1
(UNLINED)
COLLECTION
BOX NO. 2
FLOW DIVERSION
BOX NO.2
LAGOON NO.2
(LINED)
SLUDGE
LAGOON NO.1
(UNLINED)
SLUDGE
LAGOON NO.2
(LINED)
FLOW DIVERSION
BOX NO.1
COLLECTION
BOX NO.1
Rock Wall
HEADWORKS FACILITY
HEADWORKS BUILDING
(FUTURE)
WATER STORAGE
TANK
UNDERGROUND
FUEL TANK
ULTRAVIOLET
CONTACT TANK
EFFLUENT
FILTER
OPERATIONS
BLDG.
CONTROL BLDG.

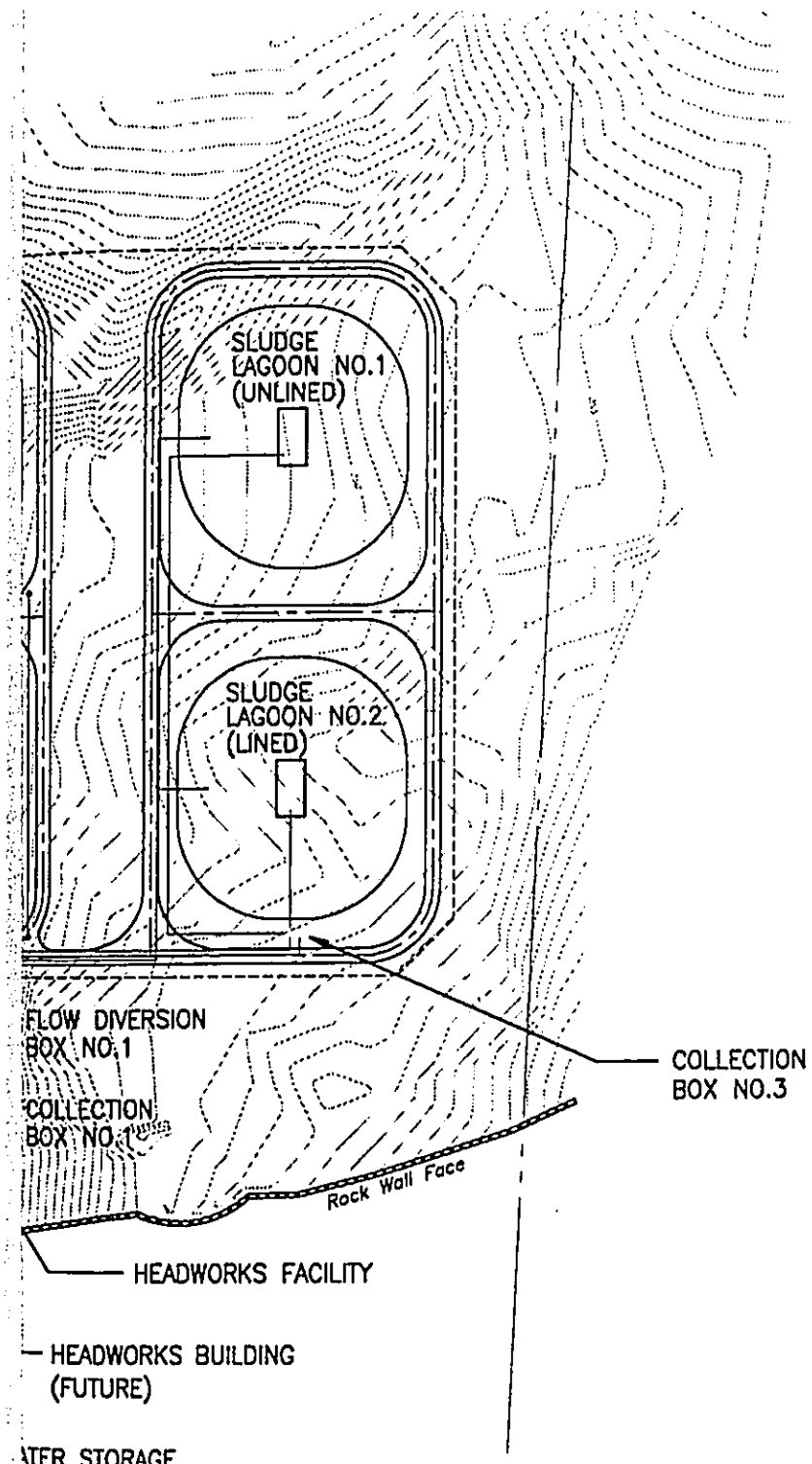


FIGURE 3-6
General Site Plan
Makena Resort
Water Reclamation Facility

0 100 200
FEET

R. M. TOWILL CORPORATION
MAY 1998

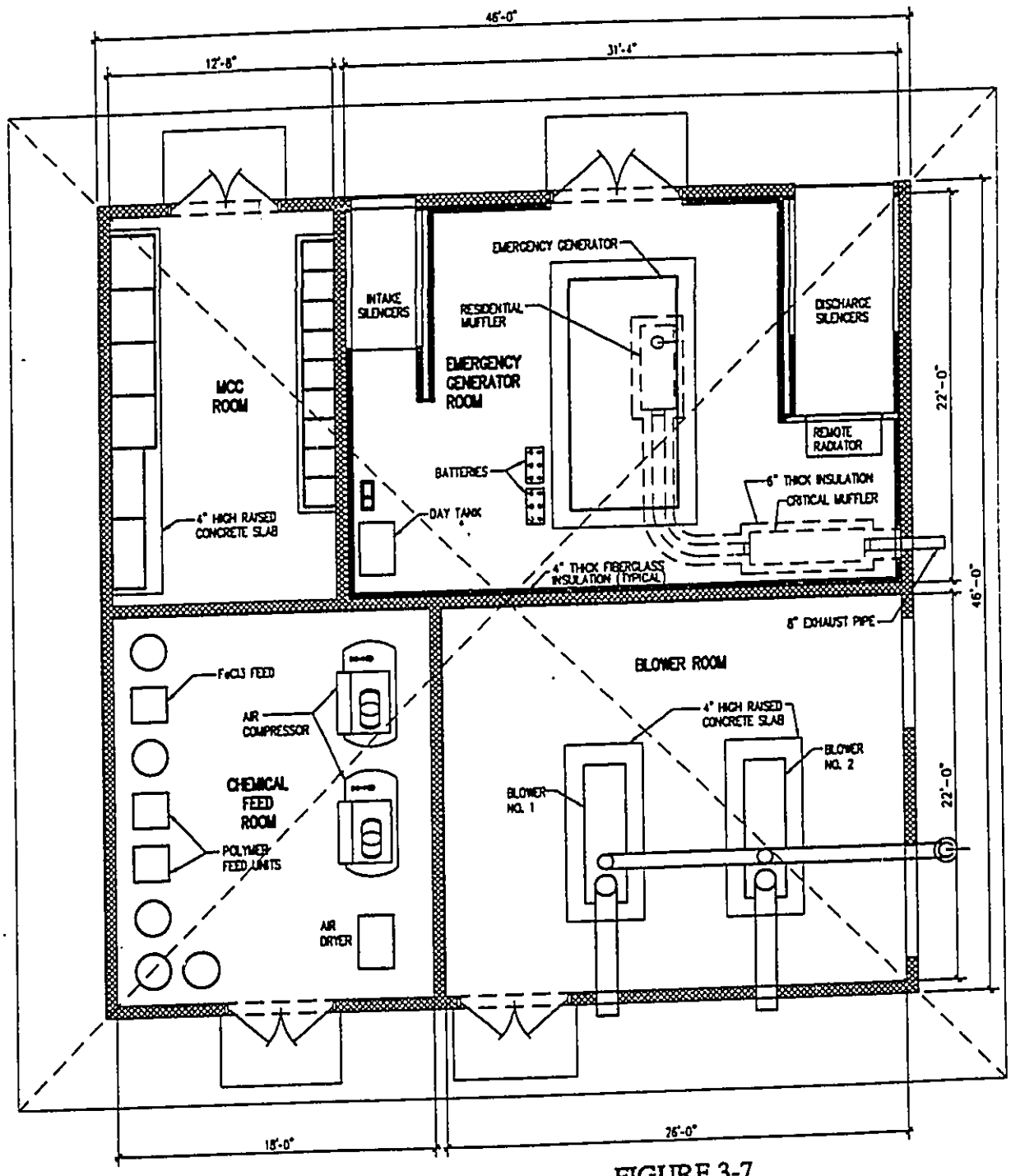


FIGURE 3-7
LAYOUT FOR OPERATIONS BUILDING
Makena Resort
Wastewater Reclamation System

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MAY 1998

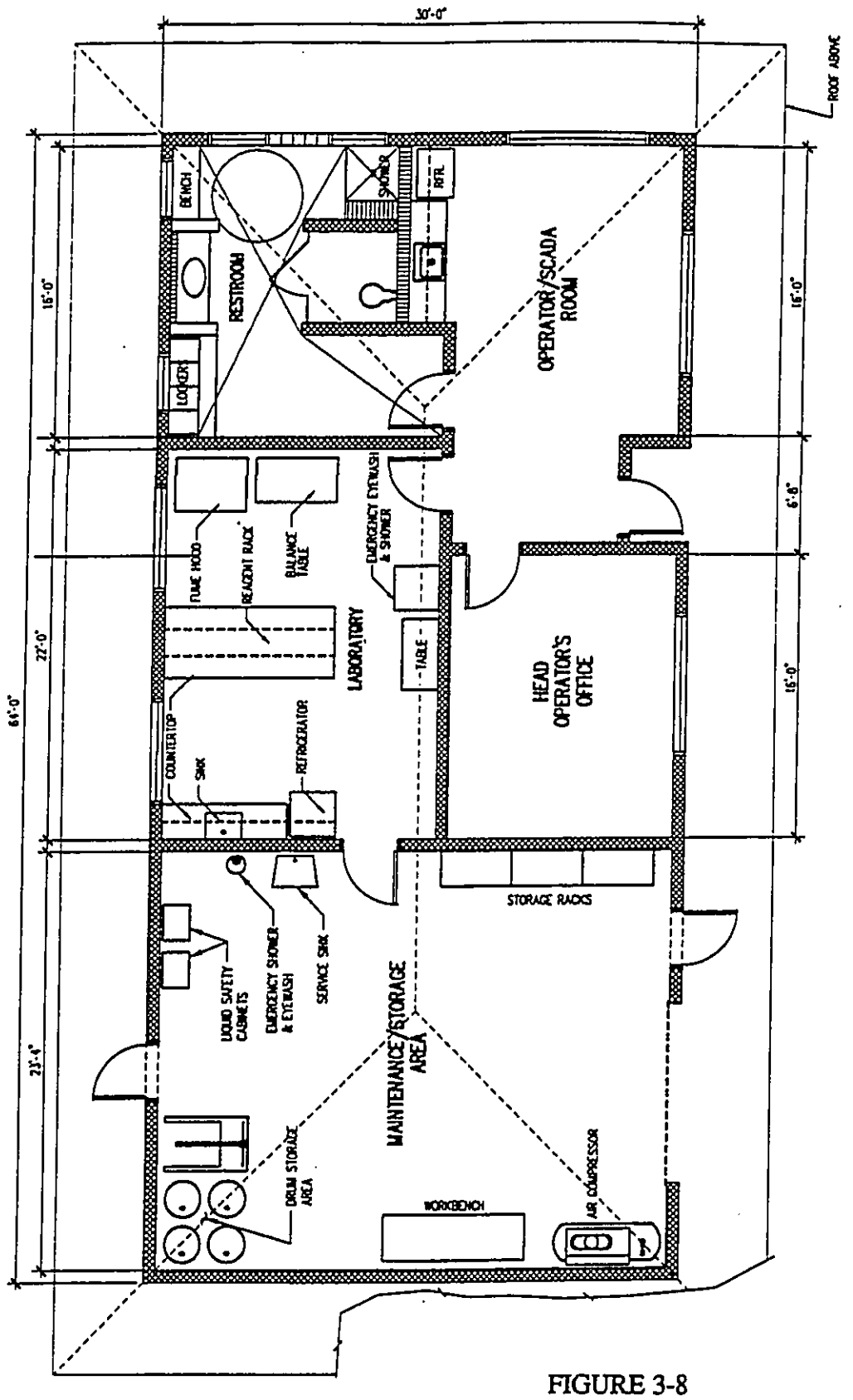


FIGURE 3-8
LAYOUT FOR
CONTROL BUILDING
Makena Resort
Wastewater Reclamation System

R. M. TOWILL CORPORATION
MAY 1998

by the operators of the composting facility. Sludge testing will be performed in accordance with the requirements of the disposal site.

3.2.4 Effluent Disposal System

The disposal system is the critical driver of the treatment process. The proposed method of disposal is primarily reclamation through reuse on the Makena golf courses. As a result, the system must meet the requirements of both the State of Hawaii, Department of Health (DOH) Chapter 62 of Title 11, Hawaii Administrative Rules, "Wastewater Systems" and the "Guidelines for the Treatment and Use of Reclaimed Water." Conditions at the Makena Resort imply compliance with State DOH R-1 effluent requirements. Irrigation of golf courses and landscaping with R-1 water is allowed through spray, drip, surface, or subsurface irrigation, without buffer restrictions.

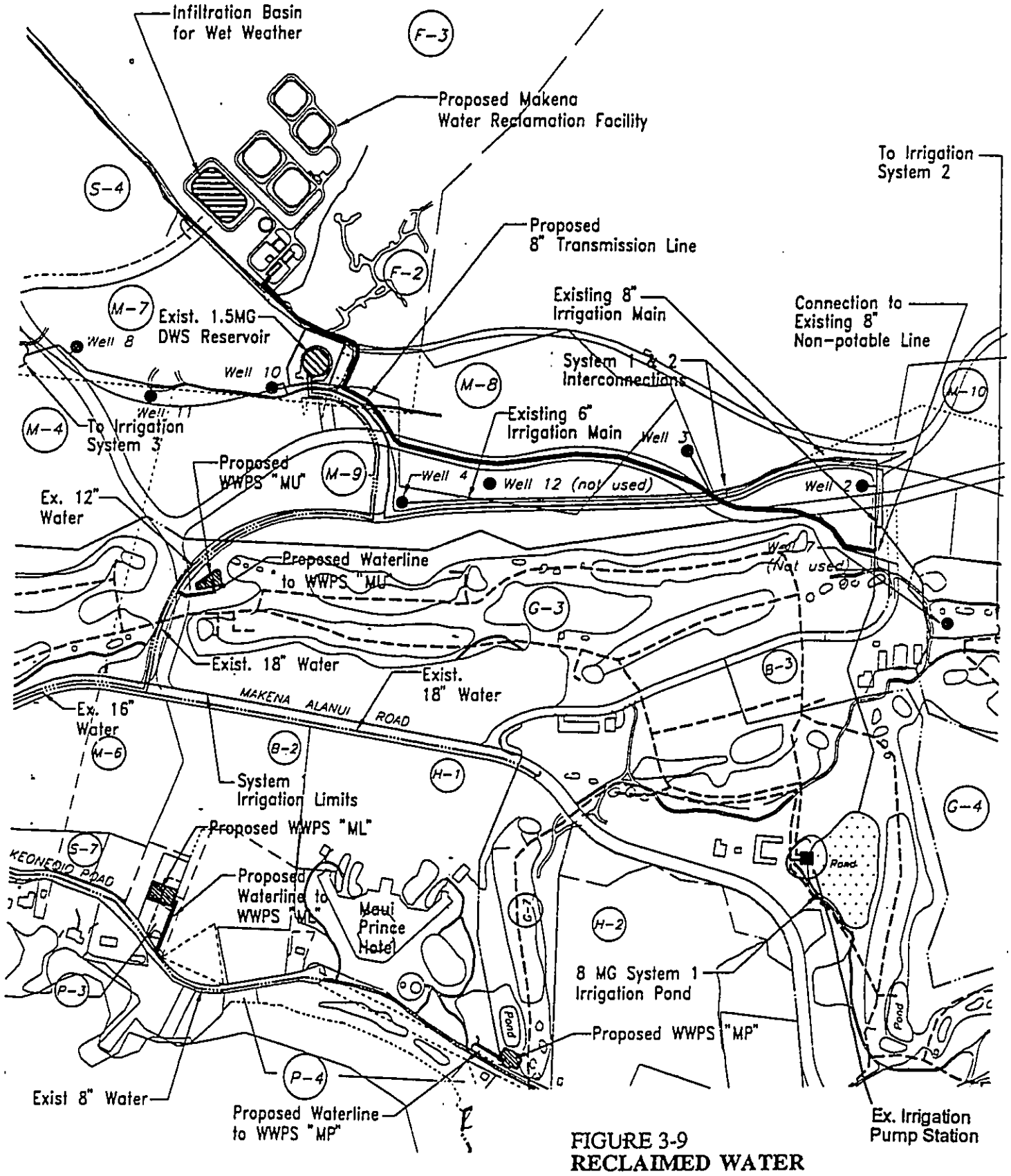
The existing irrigation distribution system and pump station at the irrigation reservoir in the Makena South Golf Course (see **Figure 3-9**) will continue to be utilized. Presently, treated effluent from the Maui Prince Hotel's wastewater treatment facility and non-potable groundwater from on-site wells are pumped to the reservoir and discharged into the irrigation system. The DOH R-1 reclaimed water from the MWRF will be stored in and distributed through the same system.

The proposed system will provide an alternative non-potable water resource, which can relieve demands upon potable water resources from the Iao Aquifer System. In addition to the golf courses, there are potential opportunities for reclaimed water use at the MWRF and wastewater pump stations. Although the amount of reclaimed water that these areas could use is incidental to the projected flows and not planned for at this time, potential uses for these areas are:

- Irrigation of landscaping, open areas, roadsides and medians
- Facility washdown
- Toilet flushing
- Fire fighting

The water reclamation guidelines are written such that the application of reclaimed wastewater will result in a 100% theoretical uptake by evaporation and vegetative uptake (referred to as evapotranspiration). The Makena golf courses cover over 433 acres and will be able to accommodate all reclaimed water generated from Increment 1 and 2 of the Makena Resort development.

The reuse system will utilize existing reservoirs and a new backup disposal system to prevent overflows or discharges from the system when the irrigation system is not in operation or when wastewater effluent quantities exceed irrigation requirements. Treated effluent will be stored in an existing lined irrigation reservoir with an approximate capacity of 8 million gallons. Assuming that the reservoir will be maintained at a minimum of 75% of its capacity, this reservoir will allow for roughly 3 days of storage at Increment 1 flows. Flows exceeding the storage capacity of the system will be diverted to the backup disposal system.



Proposed Transmission Lines
Existing Irrigation Mains
Existing Irrigation Lines
Exist. Potable Water Lines
System 1 Irrigation Limits
Non-Potable Wells ●
Pumps ■

FIGURE 3-9
RECLAIMED WATER IRRIGATION PLAN
Makena Resort
Wastewater Reclamation System

0 600 1200
FEET

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MAY 1998

The backup disposal method will be subsurface disposal using an infiltration basin. The infiltration basin will consist of an unlined earthen basin constructed on the site of the MWRF. The backup disposal system will only be used when wastewater effluent quantities exceed irrigation requirements, the irrigation system is not in operation, or the wastewater effluent does not meet the reuse criteria. Should any of the aforementioned conditions arise, the wastewater flows will be diverted to the infiltration basin and infiltrate into the underlying soil through its unlined bottom.

3.3 DESIGN CRITERIA

3.3.1 Governing Regulations and Design Standards

DOH has jurisdiction over the design and construction of wastewater treatment and disposal facilities. Governing regulations include:

- State of Hawaii, DOH, Chapter 62 of Title 11, Hawaii Administrative Rules.
- State of Hawaii, DOH, "Guidelines for the Treatment and Use of Reclaimed Water," November 22, 1993.

Standards and guidelines include but are not limited to the following:

- "Design Standards of the City and County of Honolulu, Volumes I and II," City and County of Honolulu, Department of Wastewater Management.
- "Design of Municipal Wastewater Treatment Plants," Water Environment Federation, Manual of Practice Number 8.
- "Operation of Municipal Wastewater Treatment Plants," Water Environment Federation, Manual of Practice MOP 11.

Key periodicals and technical literature used to assist in the design of wastewater systems include:

- "Water Environment and Technology," published by the Water Environment Federation.

3.3.2 Design Wastewater Flows and Characteristics

The design wastewater flows and characteristics were determined using a combination of the proposed development plan, the City and County of Honolulu design standards, and Chapter 62 of Title 11, Hawaii Administrative Rules.

The development will be divided into two increments as previously shown in **Figure 2-2.** The projected populations, special loads, and influent wastewater loadings are summarized in **Table 3-1.**

TABLE 3-1
DESIGN WASTEWATER FLOWS & CHARACTERISTICS

INCREMENT 1:

	PARCEL	AREA (acres)	DWELLING UNITS	CAP/ACRE or CAP/DWELL	CAPITA	GPCD	TOTAL FLOW (gal/day)
I–A	M–5	22.38	134	4	536	80	42,900
	M–6	13.45	81	4	324	80	25,900
	S–5	0.42	3	4	12	80	1,000
	S–7	4.17	25	4	100	80	8,000
	B–2	9.44		40	378	80	30,200
	H–1	28.85	300	2	600	100	60,000
	H–1 LAUNDRY WASTES						40,000
I–B	H–2	27.39	300	2	600	100	60,000
	H–2 LAUNDRY WASTES						40,000
	H–3	9.29	150	2	300	100	30,000
	H–3 LAUNDRY WASTES						20,000
I–C	M–2	21.10	127	4	508	80	40,600
	M–3	15.16	91	4	364	80	29,100
	M–4	18.58	111	4	444	80	35,500
	M–7	21.47	129	4	516	80	41,300
	M–8	15.12	91	4	364	80	29,100
	M–9	17.62	106	4	424	80	33,900
I–D	M–10	20.88	125	4	500	80	40,000
	M–11	13.68	82	4	328	80	26,200
	B–3	8.90		40	356	80	28,500
	H–4	7.06	95	2	190	100	19,000
	H–4 LAUNDRY WASTES						8,250
		274.939			6844		

AVERAGE WASTEWATER FLOW	689,000
BABBITT FLOW FACTOR	3.43
MAXIMUM WASTEWATER FLOW	2,363,000
DRY WEATHER I/I (5 gpcd)	34,000
WET WEATHER I/I (1500 gpad)	412,000

INCREMENT 1 FLOW SUMMARY:

DESIGN AVE. FLOW	**0.72 mil. gal./day**
DESIGN 30 DAY MAX.	**0.87 mil. gal./day**
DESIGN MAX DAY	**2.40 mil. gal./day**
DESIGN PEAK HOUR	**2.78 mil. gal./day**

INCREMENT 1 BOD LOADING

SOURCE:	BUSINESS	RATE:	0.06 lbs/cap/day
	HOTELS		0.17 lbs/cap/day
	MULTI–FAMILY		0.17 lbs/cap/day
	SINGLE–FAMILY		0.17 lbs/cap/day

BOD / DAY: 1,083 LBS/DAY
CONCENTRATION: **180 MG/L BOD5 @ AVERAGE FLOW**

TABLE 3-1 (CONT)
DESIGN WASTEWATER FLOWS & CHARACTERISTICS

INCREMENT 2:

PARCEL	AREA (acres)	DWELLING UNITS	CAP/ACRE or CAP/DWELL	CAPITA	GPCD	TOTAL FLOW (gal/day)
B–1	3.87		40	155	80	12,400
M–1	22.42	135	4	540	80	43,200
M–12	19.09	115	4	460	80	36,800
S–1	93.71	562	4	2248	80	179,800
S–2	7.70	46	4	184	80	14,700
S–3	128.60	772	4	3088	80	247,000
S–4	15.18	91	4	364	80	29,100
S–6	106.63	640	4	2560	80	204,800
	397.205			9599		

AVERAGE WASTEWATER FLOW	768,000
BABBITT FLOW FACTOR	3.32
MAXIMUM WASTEWATER FLOW	2,550,000
DRY WEATHER I/I (5 gpcd)	48,000
WET WEATHER I/I (1500 gpad)	596,000

INCREMENT 2 FLOW SUMMARY:

DESIGN AVE. FLOW	**0.82 mil. gal./day**
DESIGN 30 DAY MAX.	**0.98 mil. gal./day**
DESIGN MAX DAY	**2.60 mil. gal./day**
DESIGN PEAK HOUR	**3.15 mil. gal./day**

ULTIMATE FLOW SUMMARY:

AVERAGE WASTEWATER FLOW	1.46 mil. gal./day
BABBITT FLOW FACTOR	2.94
MAXIMUM WASTEWATER FLOW	4.28 mil. gal./day
DRY WEATHER I/I (5 gpcd)	0.08 mil. gal./day
WET WEATHER I/I (1500 gpad)	1.01 mil. gal./day
DESIGN AVE. FLOW	**1.54 mil. gal./day**
DESIGN 30 DAY MAX.	**1.85 mil. gal./day**
DESIGN MAX DAY	**4.37 mil. gal./day**
DESIGN PEAK HOUR	**5.29 mil. gal./day**

ULTIMATE BOD SUMMARY:

SOURCE:	BUSINESS	RATE:	0.06 lbs/cap/day
	HOTEL		0.17 lbs/cap/day
	MULTI–FAMILY		0.17 lbs/cap/day
	SINGLE–FAMILY		0.17 lbs/cap/day

BOD / DAY: 2,698 LBS/DAY
CONCENTRATION **210 MG/L BOD5 @ AVERAGE FLOW**

3.3.3 Wastewater Treatment Requirements

Wastewater treatment requirements are set by either the Federal Clean Water Act or are based on the method of disposal. The requirements of the Federal Clean Water Act are implemented through the State of Hawaii, DOH, Chapter 62 of Title 11, Hawaii Administrative Rules.

In the case of the MWRS where wastewater disposal will be through reuse by golf course irrigation, the more stringent "DOH Reuse Guidelines" govern final effluent requirements. The back-up disposal method will be subsurface disposal utilizing the previously described infiltration system. DOH requirements for subsurface disposal indicate disinfected secondary effluent.

Any wastewater discharge to the surrounding area from the Makena Resort Wastewater Reclamation facilities is considered a spill. Depending on its volume and location, the spill may have to be reported to the State Department of Health. A number of features have been incorporated into the design of the facilities to reduce the risk of wastewater spills. These include:

- Standby Pumps: All pumping facilities are equipped with a standby pump equaling capacity to the largest of the main pumping units.

- Emergency Generators: The pump stations and treatment plant are equipped with diesel powered generators to provide standby electric power to pump peak flows. Operation of the generators is automatic upon commercial power failure.

- SCADA System: A computer based control system will provide 24 hour monitoring of the wastewater facilities.

- O & M Manuals: The O & M manuals will outline procedures to be implemented during emergency conditions and potential spill situations. The objective of these procedures will be to minimize impacts to the public and the environment.

SECTION 4
Construction Activities

4.1 GENERAL

Construction is expected to commence soon after receipt of necessary County of Maui and State of Hawaii permits and approvals, and will continue for approximately 18 months.

4.2 SCHEDULE AND COST

Project costs are estimated in terms of Capital costs for actual construction of the system, and Operations and Maintenance (O&M) costs for system upkeep. Capital costs are summarized in Table 4-1, Estimated Capital Costs for Increment 1 below:

TABLE 4-1
Estimated Capital Costs for Increment 1
(Costs in $1,000,000)

Pump Stations & Force Mains	$ 6.3
Water Reclamation Facility	$ 6.2
Effluent Reuse System	$ 0.2
Acceptance Testing	$ 0.1
TOTAL	**$12.8**

The costs of operating and maintaining the system are summarized in Table 4-2, Estimated O&M Costs for Increment 1 below:

TABLE 4-2
Estimated O&M Costs for Increment 1

Labor	$135,000
Equipment O&M/Depreciation	$ 63,500
Power/Chemicals	$227,600
Miscellaneous	$ 8,500
TOTAL	**$434,600**

SECTION 5
Description of the Affected Environment

5.1 PHYSICAL ENVIRONMENT

5.1.1 Climate

The project site is located on the leeward coast of Maui which is typically hot, dry and sunny. The mean annual temperature is 75.7 degrees Fahrenheit. The area averages 15 inches of rain annually, with the greatest amount of rainfall occurring from the months of December through March. August and September are normally the hottest and driest months and January through March are the coolest and wettest.

Winds are generally from the northeast except during the winter months when storms are usually accompanied by south winds. The Kihei-Makena shoreline areas are also subject to unpredictable local winds from Kalama Park to Cape Kinau. These winds are created as the trade winds increase in velocity as they travel between the West Maui Mountains and Haleakala and meet the eddy current of the trades deflected along the southeast slopes of Haleakala (University of Hawaii, 1983).

5.1.2 Physiographic and Geologic Impacts

The project site has an average slope of approximately 12 percent to the 250-foot elevation and an average slope of approximately 8 percent to the 275-foot elevation. MWRF is at the 320- to 350-foot elevation. The greatest slopes are found north and east of Keawalai Beach.

The project site is situated near the southwestern rift zone of Haleakala which contains volcanic rocks and substrate of the Hana Volcanic Series. These rocks and substrate were produced by prehistoric aa and pahoehoe flows of basalt, picritic basalt, basaltic andesite and andesite (Steams, 1946). Similar to other recent lava flows, the aa and pahoehoe substrate are relatively permeable.

Impacts and Mitigation Measures

The proposed project will not create substantial physiographic or geologic impacts. Construction of the pump stations would result in excavation of 2,000 cubic yards of earth. Construction of the MWRF would result in excavation of 33,000 cubic yards of earth. All excavated material will be used in either berming, embankment, and as possible landscaping soil.

5.1.3 Soils

The project site contains soils from the Makena series. The specific soil type found at the site is Makena Loam, Stony Complex. The permeability of this soil type is moderately rapid at 2.0 to 6.3 inches/hour, runoff is slow to medium, and its erosion hazard considered slight to moderate (Soil Conservation Service, 1972).

Impacts and Mitigation Measures

The use of standard erosion control measures during clearing and grubbing, grading, trenching, and other construction activities will prevent a significant increase in erosion.

5.1.4 Drainage

The Makena Resort development is situated within a drainage basin which begins at the 5,300 foot elevation and extends downward toward sea level. There is only one well defined natural drainage way within this basin. This drainage way is located north of Nahuna Point and is dry throughout most of the year. All other storm runoff sheet flows toward the sea and usually settles in the low lying areas until it either infiltrates into the ground, evaporates, or in extreme cases, overflows into the coastal waters. The mean annual rainfall for this area is about 15 inches. As a result, it is believed that the project site receives the greatest amount of precipitation from Kona (southerly) storms which are typically heavy rain carriers.

To address flooding considerations, the 1989 Federal Insurance Rate Maps (FIRM) were referenced. The location of the proposed wastewater reclamation system was checked against shallow and coastal flooding delineations of a 100 year storm for the Makena area. The flood elevation for inundated areas varies from 9 to 10 feet mean sea level (MSL). The project facility nearest to the coastline is WWPS "ML". The lowest existing elevation of the site is about 12.6 feet MSL.

Impacts and Mitigation Measures

The proposed Makena Wastewater Reclamation System project is not situated within any flood zones as defined by the FIRM. Therefore, project impacts with regard to flood zones would not be a concern.

An increase in impermeable surface areas from development of the wastewater reclamation facility and pump stations is expected. However, the proposed site for the Makena wastewater facility is surrounded by substantial amounts of vacant land. Pump station sites are surrounded by resort related facilities including golf course land. All facility sites will be graded to minimize the impact of runoff onto the open areas.

5.1.5 Hydrology

The western slopes of East Maui, from Makena to Paia, have no perennial streams. There is only one well-defined natural water course in this area, located north of Nahuna Point, which is dry throughout most of the year. Storm runoff "sheet flows" toward the ocean and usually settles in the low lying areas until it either infiltrates into the ground, evaporates, or in extreme cases, overflows into the coastal waters.

Most rainfall returns to the atmosphere directly or indirectly by evapotranspiration, theoretically leaving no net balance for surface water runoff or deep percolation to ground water. Actual recharge to groundwater probably does occur, though undoubtedly it is too small to sustain any fresh basal water bodies in the coastal area between Kihei and Makena. The chances of developing fresh basal water sources between Kihei and Makena are slim for distances less than

two miles inland from the shore, because well data shows the basal lens located here is brackish, very thin and chloride sensitive to pumping. High-level, dike-confined groundwater is not known to occur and probably does not, for lack of heavy rainfall.

Impacts and Mitigation Measures

Subgrade structures and transmission lines shall be designed to help prevent discharge of wastewater into the groundwater and infiltration of groundwater into the proposed system. Construction of the wastewater system will only marginally increase the amount of impermeable surface in the area. The proposed site for the Makena wastewater facility is surrounded by substantial amounts of vacant land. Pump station sites are surrounded by resort related facilities including golf course. All facility sites will be graded to minimize the impact of runoff onto the open areas.

5.1.6 Floods and Tsunamis

Floods and tsunamis pose a hazard to a wastewater system because of their potential to cause releases of untreated wastewater from the collection system, and to damage or destroy infrastructure. The proposed MWRF and the MU pump station sites are not situated in an area of flooding (Federal Insurance Rate Map, March 1987) or within a tsunami evacuation zone (GTE Hawaiian Tel Tsunami Evacuation Zone Maps, 1996-97). Proposed pump station sites ML and MP are not located within the tsunami inundation zone (FEMA), but are located in the tsunami evacuation zone.

Impacts and Mitigation Measures

The proposed pump stations and treatment plant are not situated in areas prone to flooding (Federal Insurance Rate Map, March 1987). Of the three pump stations, MP and ML are located within a tsunami evacuation zone (GTE Hawaiian Tel Tsunami Evacuation Zone Maps, 1996-97). However, the location or design of wastewater facilities is not influenced by tsunami evacuation factors. This information is provided to the general public for civil defense precautionary measures in the event of a natural disaster.

5.1.7 Terrestrial Flora and Fauna

No rare or endangered species of flora and fauna are known to inhabit the proposed project site. With respect to avifauna, the Hawaiian black necked stilt (aeo) had not been sighted on the property prior to development of the Makena Golf Course. Since completion of the two golf courses, this endangered species had been seen as they feed in the areas of the golf course water features. The black-crowned night heron (aukuu) is also sighted in the Makena Golf Courses. Also, the endangered dark-rumped petrel, which occurs in Maui and nests in Haleakala Crater, may travel near the area. The endangered Hawaiian bat might also be found occasionally in the area. Other mammals, either accidentally or intentionally introduced into the project area include: the roof rat or black rat, polynesian or Hawaiian rat, house mouse, small Indian mongoose, axis deer, Wild Boar and feral cattle. During the summer months, deer and boar are frequently found on the golf course and resort area in search of water.

The majority of the existing flora at the proposed site consists mainly of introduced species. Vegetation consists typically of open kiawe forest and a wide variety of introduced grasses, shrubs, forbs and vines. Four species of endemic but not endangered plants are found here: ilima, hialoa (*Waltheria americana*), prickly poppy (*Argemone glauca*), and wiliwili (*Erythrina sandwicensis*).

Most fauna found in the project site are introduced species. Historically, there is no evidence that the endemic forest birds were ever found in this lowland dry area. As a result of the introduction of hundreds of exotic plants and several herbivorous animals, very few native plants can be found in lowland areas where man has had an influence. Thus, endemic forest birds are not found in the Makena area because they are largely dependent upon the native ecosystems in which they evolved.

Impacts and Mitigation Measures

Because the project area is not known to contain any rare or threatened plants or animals, adverse impacts will be minimal. Construction activities will be limited between the hours of 8:30 am to 3:00 pm to prevent use of an artificial lighting at the project site. Any impacts from construction related lighting to the surrounding ecosystem, including avifauna, is not anticipated. Potential impacts from overhead permanent lighting at the project site will be mitigated by shielding the light and orienting it toward the ground.

The endangered Hawaiian black necked stilt has been observed in the project area and is known to be attracted to the open water areas. The proposed settling ponds will be designed such that the species could not be attracted to the ponds. The measures will include steeply-sloped side walls and a deep base foundation which make the water body inaccessible to them. Therefore, project is not expected to have any adverse impacts on the endangered species in the area.

5.1.8 Marine Flora and Fauna

The coastal area fronting the proposed project has many common intertidal and supratidal organisms and a large diversity of fish. The beaches of South Maui in the vicinity of the project site are known to provide nesting areas for the endangered hawksbill sea turtle. Also, the protected green sea turtle (*Chelonia mydas*) and the humpback whale (*Megaptera novaeangliae*) have been sighted in the area.

The intertidal and supratidal organisms present along most of the shoreline near the project site include: snails (*Siphonaria normalis, Nerifa picea, and Litforina pintado*); common algae (*Ulva*, *Acanthorphora*, and *Ectocarpus*), littoral algae (*Geldium, Ahnfeltia,* and *Ulva*), red algae (*Jania* and *Hemitrema*), green algae (*Neomeris*), and algae (*Enteromorpha*, and *Porolithon*); rose coral (*Pocillopora meandrina*) and the massive coral (*Porites lobata*), and other coral species (*Montipora* and *Palythoa*); sea urchins, the heart urchin (*Tripneustes gratilla*), the black urchin (*E:chinothrix diadema, E. calamaris* and *Eucidaris*), the red slate pencil urchin (*Echinometra mathaei*), the common purple rock urchin (*Colobocentrofus afrafus*); common sponges (*Terpios zefeh* and *Cliona vesfifica*); sea cucumber (*Actinopyga*, and *Holothuria atra*); conger eel (*Conger*

marginafus); the green sea star (*Lincka diplax* and *L. multifera*); the hydroid anemone (*Pennaria tiarella*); the cowry (*Cypraea maculata*); rock crab (Grapsus); and brittle star (*Ophiocoma*).

Fish in the coastal zone near the project site include: common surgeon fish (*Acanthurus nigrofuscus*), wrasse (*Thalassoma duperreyi*), and damsel fishes (*Chromis ovalis, Pomacentrus jenkinsi*). In addition, within the tide pools there were opihi (*cellana sandwicensis*); soft coral (*Zoanfhus*); and the rare wave-resistant rock snail (*Liffonina picta*); rock crab (*Istiblennius*); shrimp (*Stenopus*); damselfish (*Abudefdu Simparipennis*), the blennie (*Runula ewaensis*), the hawkfish (*Paracirrhifes arcafus*), and the puffer fish (*Canfhigasfer jacfator*).

Impacts and Mitigation Measures

No adverse impacts are anticipated on marine flora or fauna. Although the hawksbill sea turtle is known to nest along the beaches of South Maui, the site is located mauka of the area's major roadway (Kihei Road). In addition, construction activities will be limited between the hours of 8:30 am to 3:00 pm to prevent use of an artificial lighting at the project site. Furthermore, there will be no night lighting at the proposed pump stations. The reclamation facility is situated more than a mile away from the shoreline. Potential impacts from overhead permanent lighting at the project site will be mitigated by shielding the light and orienting it toward the ground and away from the beach. Therefore, it is not likely that the proposed project will interfere with their habitats. No adverse impacts on marine life are anticipated to result from artificial lighting at the project site.

The primary effluent disposal method for the proposed MWRF will be reuse through irrigation of golf courses. Treatment level requirements based on reuse application are defined specifically in the State Department of Health's (DOH) Water Reclamation Guidelines. The water reclamation guidelines are designed such that the application of reclaimed wastewater to golf courses will result in a 100% theoretical uptake by evaporation and vegetative uptake (referred to as evapotranspiration). Therefore, no net increase in runoff into the marine environment or seepage into the ground is expected.

Construction activity precautionary measures need to be taken to ensure that no short- or long-term impacts will occur with the humpback whale, that is known to transit the area between December and March, and the green sea turtle. Construction stormwater management measures and erosion control mitigation measures will be required and reviewed by the State DOH and the County of Maui Department of Public Works prior to the start of construction. Such design measures will be prepared in accordance with State and County rules and regulations.

5.1.9 Water Quality

Makena Resort Corp. has commissioned a program to regularly evaluate water quality and chemistry at locations along the shoreline to monitor variations in effects from the golf course in both space and time. Since August 1995, Marine Research Consultants has issued four reports that assessed the water quality for the coastal area fronting Makena Resort. Their fourth and latest document, entitled Marine Water Quality Monitoring Program, Makena Golf Courses,

Makena, Maui, Water Chemistry: Report 1-97 with samples taken in April 1997, was published in June 1997. The following is a summary of these water quality findings.

Three survey sites directly downslope from the Makena Golf Course site were selected as sampling locations. A fourth site, located offshore of an area with minimal land-based development, particularly golf course operations, was selected as a control.

"Comparing water chemistry parameters to DOH standards revealed numerous measurements of nitrate, few measurements of ammonium and total dissolved nitrates, and several measurements of chlorophyll exceeded the DOH not to exceed more than 10% of the time criteria for dry and wet conditions of open coastal waters. It is apparent that concentrations of nitrate and nitrite nitrogen in nearshore marine waters that contain a mixture of seawater and natural groundwater may exceed DOH criteria with no subsidies from activities on land," Marine Research Consultants, Oct. 1996. In August 1995, comparing water chemistry measurements to DOH standards specified for wet conditions revealed that no measurements of ammonium, turbidity or chlorophyll exceed the criteria. Further, in October 1996," no measurements of total phosphorus or turbidity exceeded any DOH standard," (Marine Research Consultants).

Impacts and Mitigation Measures

The primary effluent disposal method for the proposed MWRF will be reuse through irrigation of golf courses. The wastewater that leaves the reclamation plant will meet DOH guidelines for reuse in public access areas.

The treatment system is designed with redundant features which would minimize the probability of untreated wastewater (not meeting reuse quality guidelines) entering nearby surface or ground waters. The long retention period within the aerated lagoons, sand filtration and disinfection all work together to remove and inactivate disease causing microorganisms.

During storm events, the MWRF and reuse system will implement two alternative strategies to allow zero discharge for extended periods of time. A lined irrigation reservoir that the reclaimed water will be discharged to has a capacity of approximately 8 million gallons. Under normal operating conditions, this reservoir will allow for 3 to 4 days of storage. When storage or disposal of the reclaimed water must continue beyond the storage capacity of the reservoir, the reuse system will employ subsurface disposal using an infiltration basin.

5.1.10 Air Quality

No ambient air quality data is available for the project site due to its geographical location. However, there are several sites throughout the State which monitor air quality. On Maui, the sampling locations are at Kahului and Kihei. Results from a 1980 summary report noted Kihei as being one of the areas averaging the highest amount of particulate matter. This may be partly due to the high wind conditions experienced between the West Maui mountains and Haleakala, and because the area is close to sugar cane fields which portions are burned and stripped of

vegetation several times a year. The project site is apparently affected by southwesterly winds which, for the most part, maintain a relatively "clean" lower atmosphere under existing land uses. However, these same winds are also responsible for transporting pollutants from Maui's Central Valley.

Impacts and Mitigation Measures

Although there will be temporary effects due to construction activities and equipment, the proposed action is not expected to significantly affect air quality in the Makena area. In order to mitigate the impacts during construction, the Contractor will be required to follow State and County regulations regarding dust control and notify the surrounding neighborhood of the construction schedule. To provide dust control during construction, dust netting shall be erected along the limits of construction and grading.

To minimize the long-term impacts upon air quality, odor control measures will be implemented, including operational control and installation of odor control equipment to collect and treat foul air at the pump stations and treatment plant. Construction activities and the operation of the facilities will comply with the Clean Air Act.

5.1.11 Noise Levels

Due to the rural character of the region and the relative absence of urban uses, noise levels throughout the project area are quite low. Prevalent noise during the daytime hours is from traffic along roadways, and wind, birds and insects.

Impacts and Mitigative Measures

Short-term noise impacts are primarily related to construction activities, especially the use of heavy equipment. To mitigate short-term impacts associated with construction, specific start and curfew times will be established for construction activities. Operator and contractor will comply with the provisions of Chapter 11-46, Hawaii Administrative Rules, "Community Noise Control."

Long-term noise impacts on the area surrounding the new MWRF and wastewater pump stations would generally be attributed to operation of the emergency generator, pumps, and ventilation fans. In order to maintain noise levels within allowable limits, noise-generating machinery will be housed in acoustically treated enclosures. Mitigative measures for the emergency generator include the use of intake and exhaust silencers into the generator room consisting of duct work and sound attenuators, exhaust muffler and discharge silencer in series, and acoustical walls and ceiling panels for the generator room. Mitigative measures for the wastewater pumps include acoustical walls and ceiling panels. Furthermore, the pumps will be situated underground. In addition, an acoustical specialist has designed a sound attenuation system for each structure to meet State standards.

5.1.12 Archaeological and Historical Resources

A field survey of the proposed wastewater reclamation facility site, the force main corridor, and pump station locations (pump stations MP, ML, and MU) was conducted on January 9, 1997 by

Aki Sinoto Consulting - Cultural Resource Management, archaeological consultants. The letter report is included as Appendix B. The findings of the consultants' report are summarized as follows:

Major portions of the proposed 13-acre wastewater reclamation facility site have been previously disturbed by bulldozing and chain clearing for ranching activities. Consequently, much of the area is clear of rocks and generally flat. No surface cultural remains of significance were located in the project area. A ranching wall composed of stacked rock defines the southwestern boundary of the area and modern corrals and pens, made of lumber, are located adjacent to the haul road near the central portion of the northwestern boundary. No further archaeological procedures appear to be warranted prior to construction for the wastewater reclamation facility.

Major sections of the force main and transmission lines traverse previously developed portions of the Maui Prince Hotel grounds, roadways, or golf course. The remaining segments traverse undeveloped area at the golf course boundaries, in between fairways, and undeveloped mauka parcels. Again, no further work is recommended prior to construction since the transmission corridor will traverse areas that have been previously disturbed, such as construction access or maintenance roads. An inventory survey currently pending completion will identify any sensitive areas in the mauka parcels. Thus, the corridor can be adjusted.

The area surrounding the hotel pump station (MP) site has been previously developed both for hotel and golf course. The area was included in previously completed archaeological studies including data recovery. No further archaeological procedures are recommended for this site.

The lower elevation pump station (ML) is located just inland of the public comfort station and parking area associated with the north cul-de-sac. The area is currently unused and consists of typical open land with kiawe, lantana, and other dry shrubs and grasses. This area was also included in several of the previous archaeological surveys. No surface archaeological remains occur within the boundaries of the 9,000 square foot pump station site.

The upper elevation pump station (MU) is located northwest of the 17th tee of the north course. The area currently is a natural area along the eastern boundary of the golf course. This area, like the others, has been included in several archaeological studies. No significant remains occur within the boundaries of this pump station site. No further archaeological procedures are warranted.

The areas evaluated during the January 1997 field work were found to be devoid of any significant cultural remains. Any remnants may have been previously destroyed by ground disturbing activities associated with ranching or more recent development activities for the hotel and/or golf course. These circumstances in addition to the fact that several previous studies have incorporated these areas, deem further archaeological procedures unwarranted. Monitoring during construction is recommended only for the wastewater reclamation facility site.

Impacts and Mitigation Measures

Because major portions of the project locations have been previously disturbed by ranching activities and subsequent resort development and clearing, the proposed project will have no significant adverse impacts on the site archaeologically. An inventory survey currently pending completion will identify any sensitive areas in the mauka parcels where the section of the proposed transmission corridor is sited. Since no further archaeological work is recommended prior to construction and the transmission corridor will traverse areas that have been previously disturbed, the corridor can be adjusted to avoid any potential remains in this area or appropriate mitigation measures can be undertaken when the final corridor alignment is determined.

An archaeological monitoring plan covering both the proposed facilities and associated infrastructure developments is being prepared in accordance with the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR) guidelines.

5.1.13 Scenic and Visual Resources

Views from the proposed project sites include Haleakala, the ocean and the resort golf courses.

Impacts and Mitigation Measures

Views of and from each proposed project site will change slightly with the introduction of the generator buildings. Minimizing visual impact was a major consideration in the site location and design of the MWRF and WWPS's. Any development to implement the wastewater reclamation system will be in accordance with a consistent design theme throughout the resort. Towards maintaining the resort identity, development of system components will be undertaken to provide open space relief, landscaping, and low rise building forms to complement existing developed properties and the surrounding environment.

To help minimize the impact the WWPS's would have on the aesthetics of the area, several considerations will be incorporated into the design of the facilities:

- Minimizing the size of aboveground structures — the generator will be enclosed in a single story building.
- Utilizing below grade pump stations
- Effective architectural and landscaping schemes

The proposed MWRF will be located at the 320 to 350-foot elevation level in an area relatively hidden from roads. The plant will be designed to blend with the natural surroundings through the use of landscape and architectural features.

5.2 SOCIO-ECONOMIC ENVIRONMENT

5.2.1 Economy

The economy of Hawaii is small and limited in scale, as evident by changes that have occurred in the last 20 years. The components of the State's economy have been sugar, pineapple, and the military; however, during the past decade, the service sector of the economy has grown rapidly, reflecting development of tourism and investment. The growth in the tourist industry has been accompanied by a relative decline in the agricultural sector and has altered the socio-economic framework of Hawaii.

Impacts and Mitigation Measures

The proposed MWRS would not result in significant adverse social impacts. It would accommodate additional growth that is called for in the Kihei-Makena Community Plan for the Makena Resort.

The MWRS will improve the quality of wastewater treatment in the area. This, in turn, will reduce the potential for water quality-related health problems. This will also prevent the future home owners of the Makena Resort Development from suffering the inconvenience of frequent cesspool failures (i.e., eliminating nuisance and public health conditions such as odors and cesspool overflows, potential infectious diseases, as well as the inconvenience of waiting for the cesspool truck).

Construction expenditures early in the planning period will stimulate jobs and revenues in the community. The creation of direct jobs requiring specialized construction-related work and the purchase of supplies and materials for construction will support jobs locally.

5.2.2 Population and Growth Characteristics

A recent social and economic study titled, "Maui County Community Plan Update Program Socio-Economic Forecast Report" indicates, that Maui will continue to experience fairly rapid growth in population. By the year 2010, Maui is expected to have a population of 145,870 people, a 45 percent increase over the 1990 population figure. (State Department of Business and Economic Development, November 1988). Population projections specific to the Kihei-Makena District revealed a projected increase from 15,365 in 1990 to 24,846 in the year 2010 (Community Resources Inc., January 1994).

Impacts and Mitigation Measures

The projected increase in both resident and visitor population to the proposed project area requires the current system, for dealing with wastewater, be upgraded to meet future growth.

5.2.3 Surrounding Land Use

The proposed project site is located at the eastern boundary of the Makena Resort area bounded on one side by the north golf course and undeveloped land on the other. North of the Makena Resort is the Wailea Resort-Residential community, and to the south lies the State of Hawaii's Cape Kinau and Ahihi Bay Natural Area Reserve.

Impacts and Mitigation Measures

The project will not significantly impact existing land uses in the immediate vicinity. Adequate loading space and landscape treatment will be provided at all pump stations and the reclamation facility. Off-street parking will be provided within the reclamation facility site. As for the pump stations, there will be adequate space within the each site to accommodate service vehicle parking.

Potential nuisance odors related to the proposed wastewater system will be mitigated and visual impacts will be minimal. The proposed facilities will be equipped with odor reduction equipment to minimize the risk of odor nuisance. The pump stations and treatment plant will be located in areas relatively hidden from existing roads. Buffer areas and landscaping will reduce the visual intrusion on the surrounding areas. Therefore, no impacts on the surrounding land use are anticipated to result from the project.

SECTION 6
Relationship to State and County Land Use Plans and Policies

6.1 THE HAWAII STATE PLAN

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes) provides a guide for the future of Hawaii by setting forth a broad range of goals, objectives, and policies to serve as guidelines for the growth and development of the State. The proposed project is consistent with the Hawaii State Plan. The following objectives of the State Plan are relevant to the proposed project:

- Section 226-14: Facility Systems - In General
  The proposed project supports the State's goals by encouraging flexibility in the design and development of facility systems that promote modest use of resources and that accommodates changing public demands and priorities.

  Section 226-15: Objectives and Policies for Facility Systems - Solid and Liquid Wastes
  The proposed project is consistent with the State's objectives to maintain public health and sanitation standards. It promotes reuse and recycling to reduce solid and liquid wastes, and uses a system design that is efficient and economical in its disposal of solid and liquid wastes.

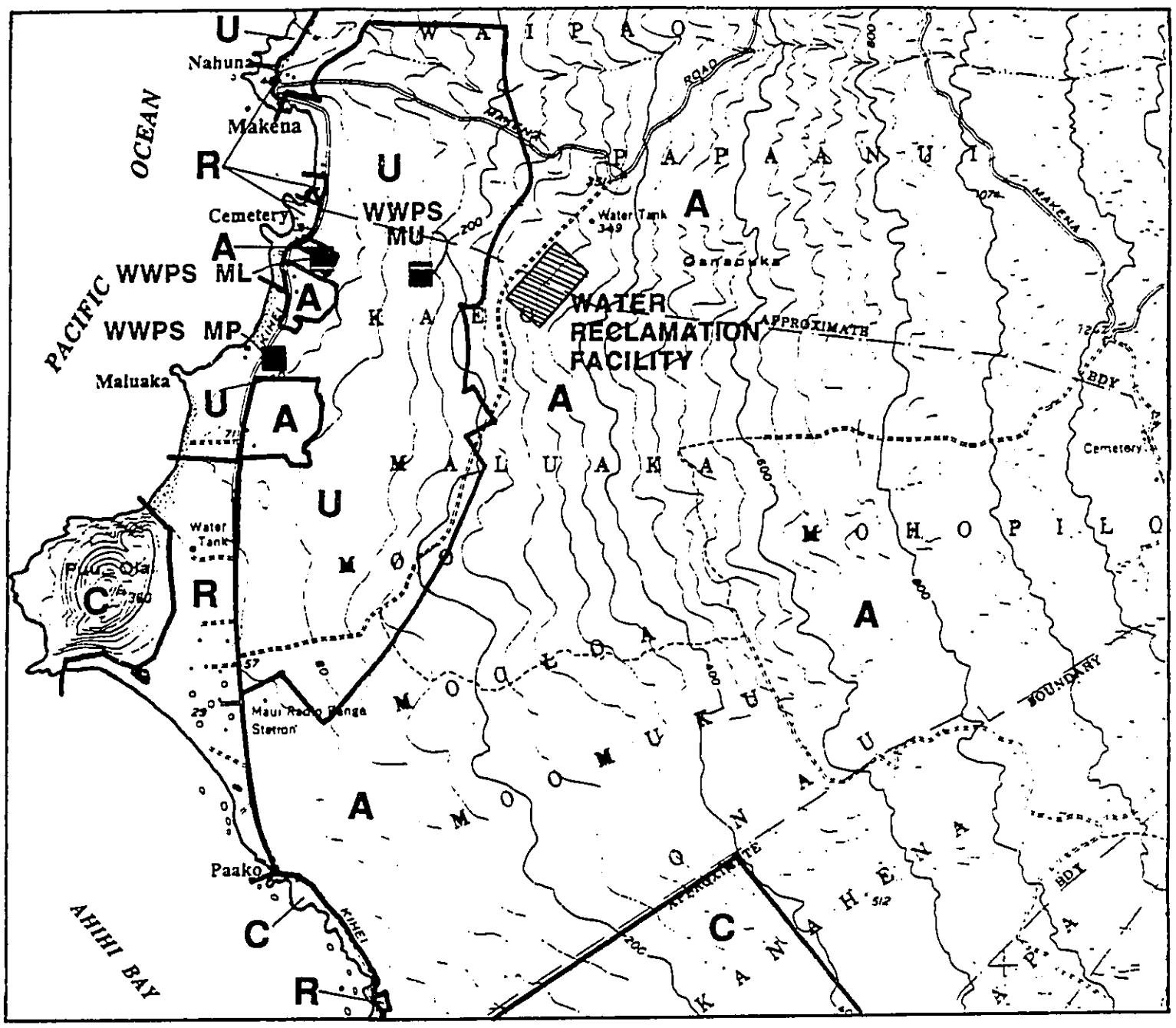
6.2 STATE FUNCTIONAL PLANS

The twelve State Functional Plans were adopted by the State legislature in April 1984. The Hawaii State Functional Plan (Chapter 226) provides a management program to control and utilize Hawaii's natural resources, to improve current conditions, and attend to various societal needs. These plans were formulated to specify in greater detail the policies, guidelines and priorities set forth in the Hawaii State Plan. The following is a description of the proposed project as it relates to the policies of the Functional Plan for Water Resources.

State Water Resources Development Functional Plan
To conserve potable water resources, treated effluent will be used for irrigation of golf courses which cover over 433 acres. The golf course areas will be able to accommodate all reclaimed water generated from increment I and II of the Makena Resort Development.

6.3 STATE LAND USE LAWS

The project's wastewater reclamation system's facility is located within the State Land Use Agriculture district (**Figure 6-1**). According to State Land Use Law (HRS Chapter 205), a wastewater reclamation facility is not a permitted use in this district. Project approval of a Special Use Permit (SUP) by the Planning Commission is required. Other proposed facilities, i.e., the



LEGEND

A	Agricultural
C	Conservation
R	Rural
U	Urban

FIGURE 6-1
STATE LAND USE
Makena Resort
Wastewater Reclamation System

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three pump stations, are located on land designated as Urban by the State Land Use classification system. Wastewater facilities are allowed within the Urban district.

6.4 COUNTY ZONING

The Maui County Zoning Ordinance designates the proposed project sites as Golf Course and Open Space, Residential and Hotel (**Figure 6-2**). A wastewater reclamation system is a permitted use within these land use designations. A County Special Use Permit is required for the proposed pump station ML to be located on land zoned R-2 (residential).

6.5 GENERAL PLAN

For Maui County, the General Plan and the Community Plans are planning documents that guide government action and decision-making. The General Plan is a narrative document that sets forth strategies to shape the County's physical, social and economic environments.

The proposed project facilitates implementation of adopted County policies relative to the development of the Makena area, in particular that of the adopted Kihei-Makena Community Plan. The proposed project supports the following goals and objectives of the County General Plan (1990):

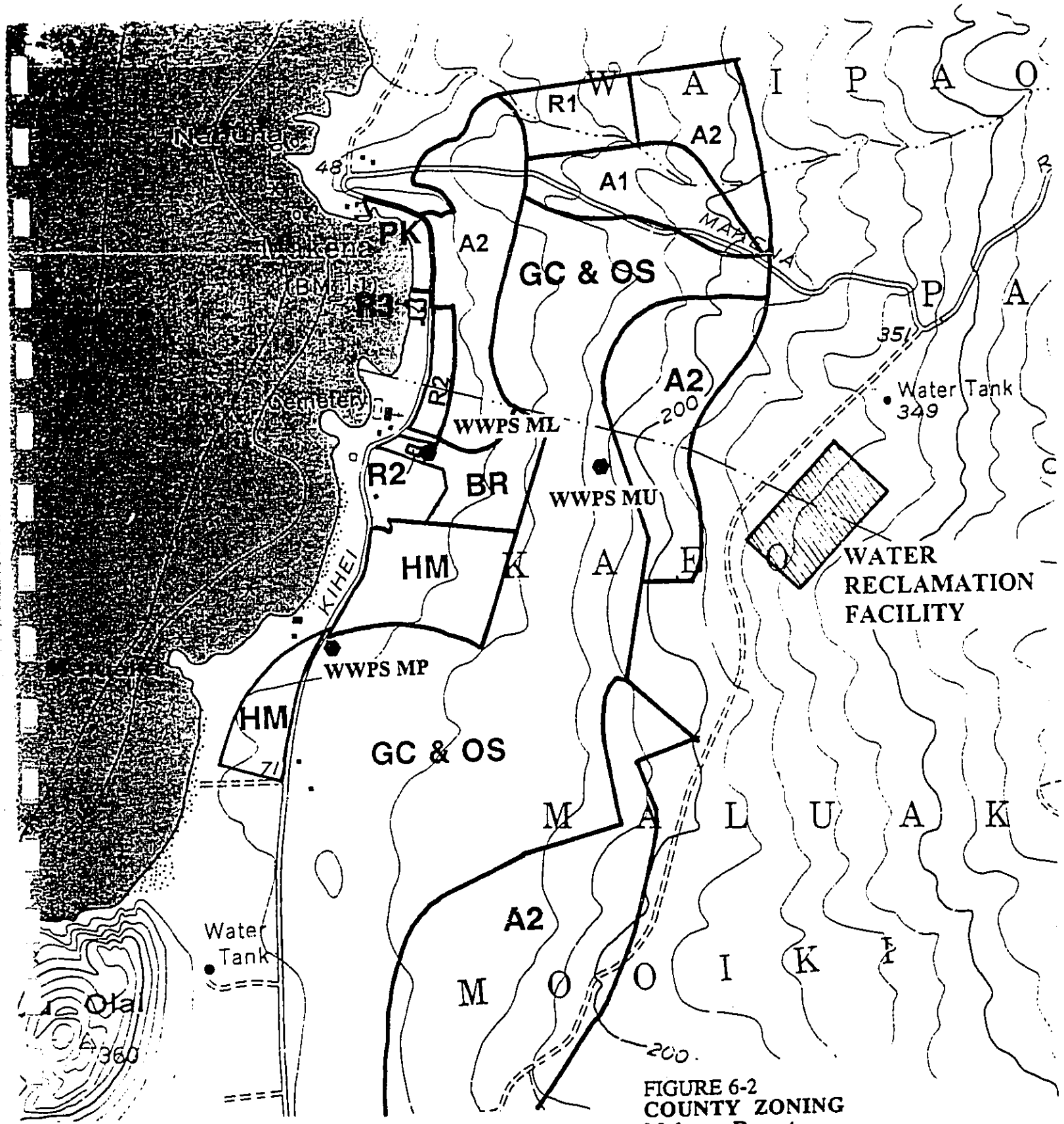
- Protect Maui County's natural environment and the health and safety of the public by providing a safe, efficient and environmentally sound system for disposal and reuse of liquid and solid waste.
- Establish programs for the development of waste disposal systems which anticipate planned growth.
- Develop comprehensive and publicly acceptable methods of recycling solid and liquid waste.

6.6 KIHEI-MAKENA COMMUNITY PLAN

The Proposed Kihei-Makena Community Plan (October 1993) provides specific recommendations to address the goals, objectives and policies contained in the General Plan, while recognizing the values and unique attributes of Kihei-Makena in order to enhance the region's overall living environment.

The proposed wastewater reclamation system is consistent with the following goals, objectives and policies as contained in Part III, Policy Recommendations, Implementing Actions and Standards:

- Coordinate improvements to sewer transmission lines and wastewater reclamation facilities to meet the needs of future population growth.
- Provide efficient, safe and environmentally sound systems for the reuse, recycling, and disposal of liquid and solid wastes.



LEGEND:

R1	Residential
R2	Residential
A1	Apartment
A2	Apartment
HM	Hotel Medium
GC & OS	Golf Course and Open Space
PK	Park
BR	Resort Commercial
STP	Sewage Treatment Plant

FIGURE 6-2
COUNTY ZONING
Makena Resort
Wastewater Reclamation System

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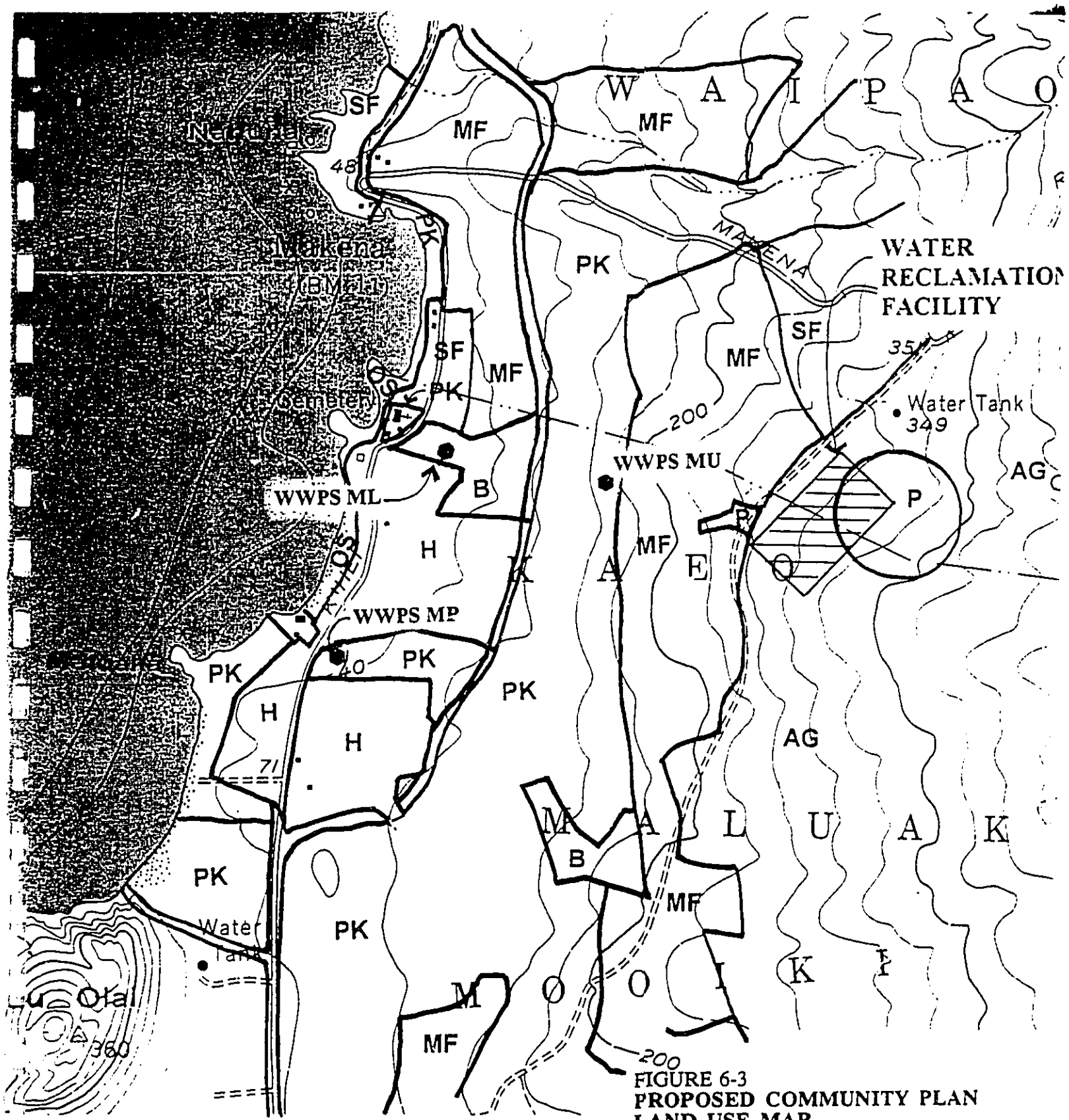
Community Plan land use designations for the proposed wastewater system sites are Residential, Business/Commercial, Golf Course and Hotel (**Figure 6-3**).

The County of Maui, through its regulatory and coordinating functions, will be supporting the foregoing goals and policies by its review of the Special Management Area Permit (SMAP), State Special Use Permit (SUP), County Special Use Permit (CSUP), and Conditional Permit (CP) required for the proposed MWRF and related components.

6.7 COASTAL ZONE MANAGEMENT LAW, 1975

As part of the Hawaii Coastal Zone Management program the County of Maui Planning Department designates and administers the Special Management Area Permit(SMAP) along the coast of Maui. The wastewater pumping facilities for the MWRF are located within the SMA Boundary as defined by the County of Maui (**Figure 6-4**). Three pump stations are required for the major collection system to transport wastewater to the proposed reclamation facility site.

The proposed project is well out of the shoreline setback area. Therefore, a Shoreline Setback Variance (SSV) is not necessary for the proposed development.



LEGEND

AG	Agriculture
R	Rural
SF	Single Family Residential
MF	Multi-Family Residential
B	Business/Commercial
H	Hotel
P	Public/Quasi-Public
PK	Park
PK	Park (Golf Course)
OS	Open Space

FIGURE 6-3
PROPOSED COMMUNITY PLAN
LAND USE MAP
Makena Resort
Wastewater Reclamation System

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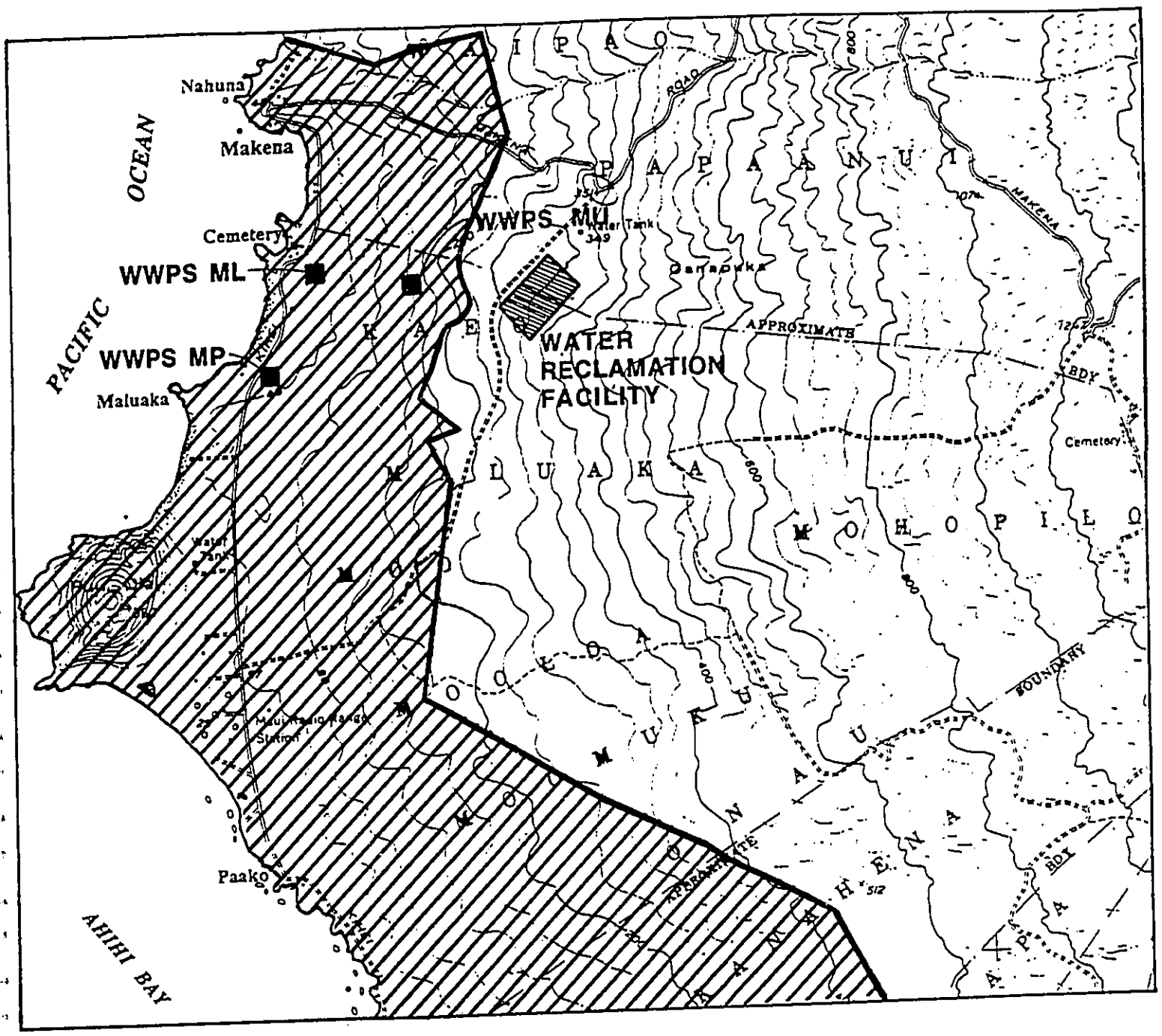

LEGEND

Special Management Area (SMA)

FIGURE 6-4
SPECIAL MANAGEMENT AREA (SMA)
Makena Resort
Wastewater Reclamation System

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SECTION 7
Alternatives to Proposed Action

7.1 NO ACTION

Taking no action is not considered to be a feasible alternative as it would prevent the resort from adequately servicing projected resident and visitor growth. The "no action" alternative consists of not sewering the area and the use of individual wastewater systems (IWSs). IWSs are on-site wastewater treatment and disposal systems, the most common being cesspools and septic systems. Cesspools have the potential to: 1) inconvenience the user, 2) pose a public health hazard, 3) contaminate drinking water sources, and 4) pollute coastal and surface waters if not properly designed, installed, or maintained. Septic systems can result in similar problems, but in general, they provide a much higher level of safety than cesspools.

Comparisons of the life cycle costs of IWSs versus other collection and treatment options indicates that IWSs would never be the least expensive choice. Therefore, the "no action" alternative is more costly, both from an environmental standpoint as well as a fiscal one.

7.2 ALTERNATIVE LOCATIONS

Alternative locations for the proposed wastewater pump stations and treatment facility were evaluated. Cost and non-cost considerations were used in the evaluations. The cost evaluations were based on the following: facility requirements, infrastructure requirements, and operation and maintenance costs. Non-cost considerations included: the potential value of the site if developed, proximity to public areas, and site conditions.

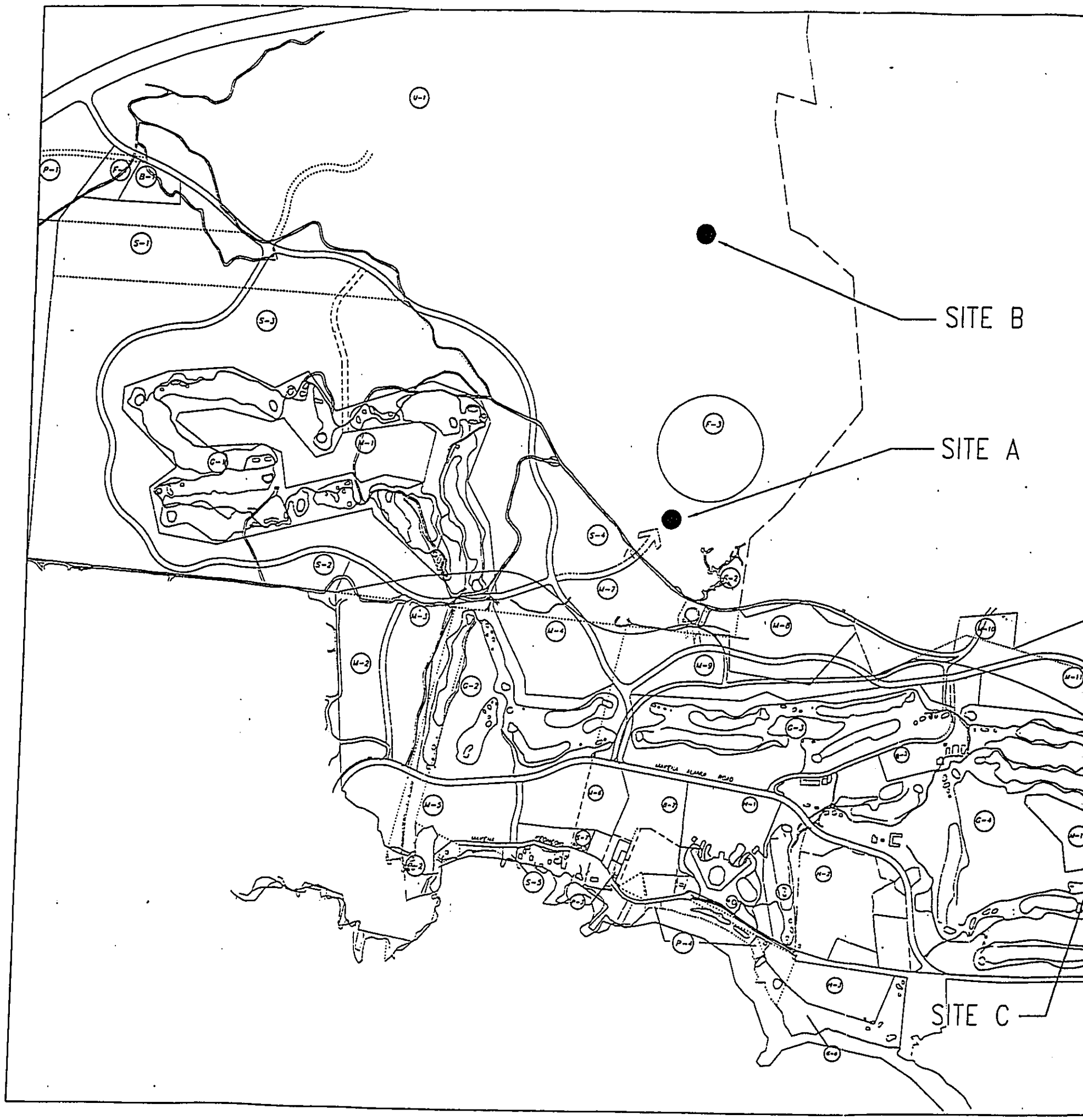
7.2.1 Alternative WWPS Locations

Topography, hydraulic conditions, and existing and proposed land use were assessed in siting of the WWPS's. Based on the components of the Makena Resort Increment 1 developments, it appears that a minimum of three pump stations are required to transport wastewater to the proposed treatment facility site. The two lower pump stations, ML and MP, are in natural low points to maximize the area that can be served by gravity sewers. The proposed WWPS locations minimize adverse impacts on aesthetics as well as existing and future land use.

7.2.2 Alternative MWRF Locations

Six alternative locations for the proposed MWRF were evaluated (**Figure 7-1**). A brief summary of the results of the evaluation is presented below:

- Rating of the alternative sites from least to most expensive is as follows: C, A, D, E, F, and B. In general, costs increase progressively with infrastructure requirements. Site B was eliminated from further consideration as its estimated costs are significantly higher than those of the other five alternatives.


SITE B
SITE A
SITE C

LAND USE	PARCEL	AREA
HOTEL		
	H-1	28.830
	H-2	37.388
	H-3	9.187
	SUBTOTAL	65.375
BUSINESS		
	B-1	3.668
	B-2	8.641
	B-3	8.900
	SUBTOTAL	27.209
MULTI-FAMILY		
	M-1	22.470
	M-2	21.095
	M-3	15.181
	M-4	18.583
	M-5	22.376
	M-6	13.445
	M-7	21.468
	M-8	13.116
	M-9	17.618
	M-10	20.880
	M-11	13.878
	M-12	19.066
	SUBTOTAL	220.973
SINGLE FAMILY		
	S-1	83.714
	S-2	7.70
	S-3	128.602
	S-4	15.184
	S-5	0.470
	S-6	106.631
	S-7	4.174
	SUBTOTAL	346.475
	SUBTOTAL	665.084
TOTAL = 1868.971 ACRES		

LAND USE	PARCEL	AREA
GOLF COURSE		
	G-1	97.787
	G-2	49.816
	G-3	51.229
	G-4	147.698
	G-5	56.714
	G-6	10.624
	G-7	0.297
	SUBTOTAL	413.318
PARK		
	P-1	24.811
	P-2	1.723
	P-3	0.462
	P-4	0.730
	P-5	2.174
	SUBTOTAL	29.895
PUBLIC/ QUASI PUBLIC FACILITY		
	F-1	4.034
	F-2	1.354
	F-3	20.000
	SUBTOTAL	25.388
FUTURE EXPANSION		
	FOR LOT-3	822.314
EXCLUSIONS		
	LOT 3-A-1-B	1.000
	LOT 3-A-1-C	5.000
	LOT 3-A-1-D	0.671
	SUBTOTAL	6.671
MAJOR HIGHWAY ROADS	EXTENSION	45.494
		36.909
	SUBTOTAL	82.403
	SUBTOTAL	1194.216

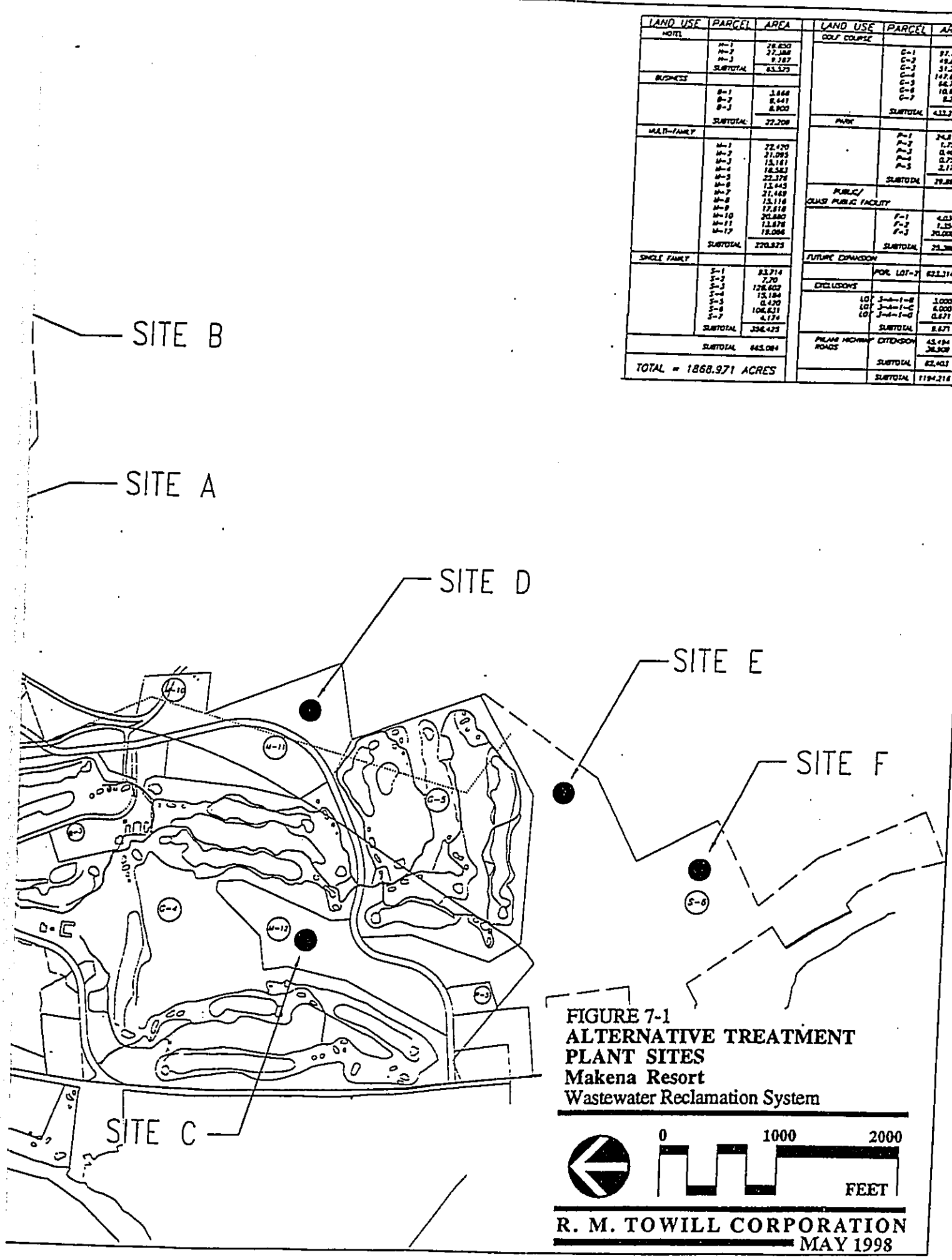


FIGURE 7-1
ALTERNATIVE TREATMENT PLANT SITES
Makena Resort
Wastewater Reclamation System

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- All of the remaining sites (A, C, D, E, and F) are feasible plant locations. In general, favorable cost considerations are offset by non-cost considerations.

- Site A is the preferred site because the lost value of land would be minimal and the infrastructure requirements are moderate. Its primary disadvantage is that it is adjacent to multi-family home parcels.

- Site C is the least costly. However its primary disadvantage is that the site is immediately usable and suitable for development.

- Site D is similar to Site A but with higher infrastructure costs. Also archaeological considerations may preclude use of a lagoon type treatment plant at this location.

- Sites E and F are attractive from the standpoint of the remoteness of these sites, however, the same results in increased capital and operation and maintenance costs.

7.3 ALTERNATIVE TREATMENT SYSTEMS

The two categories of treatment plants capable of meeting the treatment requirements of the Makena Resort Development are lagoon based and mechanical based systems.

A lagoon based system is recommended. The main advantages of this system are reduced operation and maintenance costs, simple operation, and minimal to no sludge handling requirements. A mechanical plant should be considered only if land requirements are a primary consideration.

The reasons for recommendation of a lagoon based system are:

- Minimal solids handling requirements. Solids disposal would consist of a "rubbish can" amount of screenings and grit.

- Ease of operation. The aerated lagoons would be much easier to operate compared to a mechanical system with separate liquid and solids streams and associated equipment.

- Lower O&M costs. Fewer operators are required due to less intensive daily maintenance, and type of equipment.

- Less risk of odors. With little solids handling the risk of odors is dramatically reduced.

The primary disadvantage of a lagoon based system is the large land area required, i.e., about 13 acres as opposed to roughly 7 acres for a mechanical plant.

7.4 CONNECTING TO A PUBLIC SYSTEM

At present, there are no publicly owned treatment works in operation in the area. The Maui Prince Hotel is served by a privately owned, individual wastewater system. The existing Makena Wastewater treatment system does not have the capacity to connect to other public facilities.

SECTION 8
Relationship between Local Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

The land proposed for development is presently not being used. Implementation of the proposed project will increase job opportunities as well as improve the public facilities in the area to provide for long-term community gains.

Except for the golf courses, parks and open space buffer areas, which could be more easily altered, the development will foreclose the option to develop these lands for other purposes for a long-term period. If the project is implemented as proposed, using the recommended mitigation measures to alleviate impacts from this action, significant risks to the health and safety of the people and the environment are not anticipated.

SECTION 9
Irreversible and Irretrievable Commitment of Resources

Construction of the proposed project will commit the necessary construction materials, energy, human, and fiscal resources. Commitment of these resources will provide benefits to the residents of the region and to the County. Additionally, the economy will be augmented through direct employment and its multiplier effects, and increased County and State tax revenues.

Existing vegetation will be removed by this proposed project and the visual character of the area will be altered. The proposed project will replace the vegetation with earthen structures, concrete structures, and landscaping to enhance its anticipated uses.

Commitment of land for a long period of time will foreclose the use of this land for other purposes. Construction of the wastewater treatment plant will commit land for this purpose which is essentially irreversible.

SECTION 10
Necessary Permits and Approvals

10.1 STATE

Department of Health
- NPDES NOI for Construction Activity

10.2 COUNTY

County Planning Commission
- Special Management Area Permit (SMAP)
- State Special Use Permit (SSUP)
- Conditional Permit (CP)
- County Special Use Permit (CSUP)

Department of Public Works
- Grading Permit
- Building Permit
- Subdivision
- Work to perform in County Right of Way

SECTION 11
Organizations and Agencies Consulted During EA Preparation Period

County of Maui
- County Planning Commission
- County Council
- Department of Parks and Recreation
- Department of Public Works
- Department of Water Supply
- Planning Department

State of Hawaii
- Department of Accounting and General Services
- Department of Health
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Land and Natural Resources, Commission on Water Resource Management
- Department of Transportation
- Office of Environmental Quality Control (OEQC)

Federal Agencies
- U.S. Department of the Interior, Fish and Wildlife Services
- U.S. Department of the Interior, Geological Survey, Water Resources Division
- U.S. Department of Agriculture, Natural Resources Conservation Service
- National Ocean and Atmospheric Administration
- U.S. Army Corps of Engineers, Pacific Ocean Division

Private Parties
- Keauhou O Honuaula, Inc.
- Makena Community Association

SECTION 12
Determination

No significant long-term impacts are expected from implementation of the Makena Resort Wastewater Reclamation System project. Short-term impacts will occur as a result of construction activities. These impacts include increases in noise and air pollution. However, the impacts will be temporary in nature and are expected to be mitigated as described in previous sections. The project will provide long-term benefits to residents of the region and to the County of Maui through increased job opportunities and tax revenues.

Design and construction plans will be prepared in accordance with State of Hawaii and County of Maui rules and regulations. The proposed action was evaluated in accordance with the significance criteria delineated in Section 11-200-12 of the Hawaii Administrative Rules Title 11, Department of Health, Environmental Impact Statement Rules. They are as follows:

1. **Criteria**: *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.*
   Finding: Neither the MWRF site nor pump stations and transmission corridors were found to contain any natural or cultural resources such that the action proposed may lead to an irrevocable loss or destruction of resources of this kind.

2. **Criteria**: *Curtails the range of beneficial uses of the environment.*
   Finding: The proposed sites for the MWRS are contained within the area intended for planned Makena Resort development. Most of the proposed development area has been disturbed by past ranching activity or subsequent grading and construction related to Makena Resort. The proposed project would not curtail any other beneficial uses of the environment.

3. **Criteria**: *Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343 and 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.*
   Finding: The project is consistent with the State's long-term environmental policies and guidelines that are expressed in Chapter 343 and 344, HRS.

4. **Criteria**: *Substantially affects the economic or social welfare of the community or State.*
   Finding: The proposed project is expected to have a positive impact on the economic and social welfare of the community by facilitating the planned development of the Makena Resort complex through expansion of the wastewater treatment and reclamation facility. Short-term impacts would be the

CORRECTION

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

SECTION 12
Determination

No significant long-term impacts are expected from implementation of the Makena Resort Wastewater Reclamation System project. Short-term impacts will occur as a result of construction activities. These impacts include increases in noise and air pollution. However, the impacts will be temporary in nature and are expected to be mitigated as described in previous sections. The project will provide long-term benefits to residents of the region and to the County of Maui through increased job opportunities and tax revenues.

Design and construction plans will be prepared in accordance with State of Hawaii and County of Maui rules and regulations. The proposed action was evaluated in accordance with the significance criteria delineated in Section 11-200-12 of the Hawaii Administrative Rules Title 11, Department of Health, Environmental Impact Statement Rules. They are as follows:

1. **Criteria**: *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.*
   Finding: Neither the MWRF site nor pump stations and transmission corridors were found to contain any natural or cultural resources such that the action proposed may lead to an irrevocable loss or destruction of resources of this kind.

2. **Criteria**: *Curtails the range of beneficial uses of the environment.*
   Finding: The proposed sites for the MWRS are contained within the area intended for planned Makena Resort development. Most of the proposed development area has been disturbed by past ranching activity or subsequent grading and construction related to Makena Resort. The proposed project would not curtail any other beneficial uses of the environment.

3. **Criteria**: *Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343 and 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.*
   Finding: The project is consistent with the State's long-term environmental policies and guidelines that are expressed in Chapter 343 and 344, HRS.

4. **Criteria**: *Substantially affects the economic or social welfare of the community or State.*
   Finding: The proposed project is expected to have a positive impact on the economic and social welfare of the community by facilitating the planned development of the Makena Resort complex through expansion of the wastewater treatment and reclamation facility. Short-term impacts would be the

availability of construction jobs to build the proposed facility. Longer-term impacts would be in additional jobs created for the operations and maintenance of the facility.

5. **Criteria**: *Substantially affects public health.*
Finding: The proposed project is not expected to have a substantial impact on public health. Through careful and environmentally sensitive engineering design in accordance with State and County regulations, the long term impact on public health will be negligible.

6. **Criteria**: *Involves substantial secondary impacts, such as population changes or effects on public facilities.*
Finding: Secondary impacts will be the eventual addition of resort-related accommodations within Makena Resort which are expected to result in an increase in the number of jobs, subsequent consumer spending and tax revenues to the County and the State. The expected increase will be that of short-term visitors/tourists and in an increase in residential population since workers will probably commute from other areas of the island of Maui. Thus, effects on public facilities are not expected to be substantial.

Since no construction or infringement on the beaches or nearshore zone is planned, the potential environmental impact of the proposed wastewater reclamation system on the coastal zone and its beach systems would probably be from the disruption of natural drainage patterns. During periods of moderate to heavy rainfall, such conditions would result in the potential introduction of silts and clays (washed down from the developed area) at the shoreline. Minimizing the amount of new impermeable surface areas as well as continued responsible grounds maintenance and monitoring will help curtail any secondary adverse impacts on the coastal zone.

7. **Criteria**: *Involves a substantial degradation of environmental quality.*
Finding: Adverse impacts on ambient air and noise quality will be short-term and construction related due to activities such as excavation, trenching and heavy equipment operation. Long-term impacts are not expected to have a significant impact on the environmental quality of the resort setting, because the proposed facility is being designed to be aesthetically consistent with the environment and landscaping of the resort grounds. The size and scale of each of the pump sites as well as the wastewater reclamation facility are being planned in such a manner that the final facility will not intrude upon the natural, aesthetically pleasant environment of the immediate golf course and associated resort environment. Odor and noise impact concerns are also being addressed in the engineering design stage of the proposed MWRF. Because these preventative and mitigative measures are being incorporated in the early planning and design phases, impacts on the environmental quality will not be significant.

8. **Criteria**: *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.*
Finding: The proposed wastewater treatment and reclamation facility and pump stations are being described and evaluated as a comprehensive system that is to service the Makena Resort development in the long term. Proper operations and maintenance of the wastewater management system in accordance with State and County guidelines, and an ongoing off-shore water quality monitoring program are pro-active measures that are being taken to ensure that the developed resort will not cumulatively have a significantly adverse impact on the environment.

9. **Criteria**: *Substantially affects a rare, threatened, or endangered species, or its habitat.*
Finding: No rare, threatened, or endangered terrestrial floral species, faunal or avifaunal resources are known to exist with the exception of the aeo in the project area. Marine species that may exist in the coastal waters are the endangered humpback whale and the green sea turtle. Precautionary measures will be taken to ensure that these endangered species can be part of the special conditions for the project design and construction.

10. **Criteria**: *Detrimentally affects air or water quality or ambient noise levels.*
Finding: Although there will be temporary effects due to construction activities involving heavy equipment, the proposed action is not expected to significantly affect air quality in the Makena area. In order to mitigate the impacts during construction, the contractor will be required to follow State and County regulations regarding dust control and notify the surrounding neighborhood of the construction schedule.

Long term impacts upon air quality will be minimized as odor control measures will be implemented, including operational control and installation of odor control equipment to collect and treat foul air from the pump stations and treatment plant. The operation of the facility and construction activities will comply with the Clean Air Act.

To mitigate short-term noise impacts associated with construction, specific start and curfew times will be established for the period of construction. Additionally, the contractor will be required to follow State and County regulations regarding noise control.

Mitigative measures to be taken to minimize long-term operational noise impacts include enclosure of noise-generating machinery, in acoustically treated structures to maintain noise levels within allowable limits.

11. **Criteria**: *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach,*

erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal water.
Finding: The proposed pump stations and treatment plant are not situated in areas prone to flooding (FIRM, March 1989). Pump stations MP and ML are not located within a tsunami inundation zone. Due to the elevations of the proposed facilities and the lack of any rivers or streams in the near vicinity, any possible flood threats would be minimal. If any flood threats do exist, it would be possible to eliminate these threats through appropriate grading and other design measures. The project sites are not designated as a geologically hazardous or sensitive areas.

12. **Criteria**: *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.*
Finding: Views from the proposed project site will remain unchanged and views of Haleakala and the ocean will be retained. Visual impact was one of the major criteria that was considered in the final selection of the locations of the MWRF and pump stations. Utilization of below grade package pump stations will also help minimize visual impacts. Effective architectural and landscaping design planned for the facilities will further help the sites to blend in with the natural surroundings.
13. **Criteria**: *Requires substantial energy consumption.*
Finding: The proposed project will not require substantial energy consumption. Energy conservation measures will be incorporated whenever and wherever possible and feasible.

REFERENCES

Department of Land and Natural Resources, Division of Water Resource Management, 1995.

Environmental Study Impact Corporation. 1982. Makena road, Revised Environmental Impact Statement. Honolulu and Maui, Hawaii.

GTE Hawaiian Telephone. 1995-1996. GTE Hawaiian Tel Telephone Book, Maui, Molokai, Lanai.

"Kihei-Makena Community Plan, County of Maui, July 1985". Aotani and Associates, Inc., October 1981.

"Makena Road, Revised Environmental Assessment". Environmental Impact Study Corp., Honolulu, Maui, Hawaii, 1982.

"Marine Environmental Monitoring Program, Makena Golf Courses, Makena, Maui, Water Chemistry - Report I-95". Marine Research Consultants, Honolulu, Hawaii, 1995.

"Marine Water Quality Monitoring Program, Makena Golf Courses, Makena, Maui, Water Chemistry - Report 1-96". Marine Research Consultants, Honolulu, Hawaii, 1996.

"Maui County Community Plan Update Program Socio-Economic Forecast Report Volume I". Community Resources, Inc., January 1994.

R. M. Towill Corporation. 1995. *Preliminary Engineering Report, Site Selection and Facility Type Selection*. Honolulu, Hawaii.

"Seibu Makena Master Plan, Environmental Assessment" and "Environmental Impact Statement". Neighbor Island Consultants, Hilo, Hawaii 1975.

Soil Survey of Islands of Maui, Molokai, and Lanai, State of Hawaii, United States Department of Agriculture, Soil Conservation Service, In Cooperation with the University of Hawaii Agricultural Experiment Station, August 1972.

Stearns, Harold T. 1942. "Geologic and Topographic Map Island of Maui."

The State of Hawaii Data Book 1993-94: A Statistical Abstract, Department of Planning and Economic Development. State of Hawaii 1994.

"Post Field Summary of Archaeological Inventory survey of Proposed Makena Water Reclamation Facility and Associated Infrastructures, for the Makena Resort Corp., Makena, Makawao, Maui," Cultural Resource Management - Aki Sinoto Consulting, March 1997.

APPENDIX A
Preliminary Drainage Study

R. M. TOWILL CORPORATION

420 Waiakamilo Rd. #411 Honolulu, HI 96817-4941 (808) 842-1133 Fax (808) 842-1937

27 August 1997

Mr. Roy Figueiroa
Assistant General Manager
Makena Resort Corp.
5415 Makena Alanui
Kihei, Maui, Hawaii 96753

Dear Mr. Figueiroa:

Subject: Preliminary Drainage and Erosion Control Plan for the Proposed Makena Wastewater Reclamation System, Makena Resort Development, Makawao, Maui

In accordance with Maui County Code Section 20.08.080, a drainage and erosion control plan will be submitted to the Maui County Public Works Department for review and comment. These plans will be incorporated as part of the construction set for the subject project.

As defined in Section 20.08.270 of the Maui County Code, control of erosion from general clearing and grading operations as well as the cut and fill slopes shall be implemented to prevent damage by sedimentation to streams, floodplains, watercourses, natural areas and property of others.

Control of erosion for the Makena Wastewater Reclamation System shall be approached as follows:

Permanent: This control shall be considered and set forth in the original professional design of the project to provide erosion control following completion of construction.

On-site drainage shall be handled through grading and swales in such a way so as to control erosion and to return waters to the natural drainage course free of sedimentation or other pollution.

Temporary: This control is to be exercised by the clearing and grading contractor during the construction phase and prior to completion of the permanent erosion control facilities.

Exposure: The area of land to be opened may not exceed fifteen acres, except that the director may increase this maximum to a size larger that fifteen acres if the adopted conservation standards can be maintained, or the director may reduce the maximum to a size below fifteen acres if he feels that the conservation standards will not be met. Additional area shall be opened for grading or grubbing until measures to prevent dust or erosion problems in the area already graded or grubbed have been satisfactorily completed.

The largest construction site for the Makena Wastewater Reclamation System is the Water Reclamation Facility which is approximately 13 acres.

Dust Control: All work areas within and without the actual grading area shall be maintained free from dust which will cause a nuisance or hazard to others.

To provide dust control during construction, dust netting shall be erected along the limits of construction and grading. Open surface areas may be watered down as necessary.

Vegetation: Whenever feasible, natural vegetation , especially grasses, should be retained. If it is necessary to be removed, trees, timber, plants, shrubbery and other woody vegetation, after being uprooted, displaced or dislodged from the ground by excavation, clearing or grubbing, shall not be stored or deposited along the banks of any stream, river or natural watercourse. The director may require the removal and disposal of such vegetation from the site within a reasonable time but not to exceed three months.

Vegetation control will be addressed through the combined efforts of the grading and landscape plans. Landscaping plans are being prepared as part of the construction set.

These control measures will be documented and presented in the grading and drainage sheets as part of the Makena Wastewater Reclamation System plans.

Sincerely,

Leighton W. K. Lum, PhD. PE
Chief Environmental Engineer

LL:mn

APPENDIX B
Archaeological Assessment

Aki Sinoto Consulting - Cultural Resource Management
2333 Kapiolani Blvd. No. 2704, Honolulu, Hawaii 96826 Tel (808)941-9538 Fax (808)942-1096

March 7, 1997

Mr. Roy Figueiroa
Makena Resort Corp
5415 Makena Alanui
Kihei, Maui, Hawai'i 96753

Dear Roy:

Subject: Post-field Summary of Archaeological Inventory Survey of Proposed Makena Water Reclamation Facility and Associated Infrastructures, for the Makena Resort Corp, Makena, Makawao, Maui

A surface survey of the proposed wastewater reclamation facility, portions of the force main transmission corridor, and pump locations (Pump Stations MP, ML, and MU) was undertaken on Monday, 9 January 1997 by Jeffrey Pantaleo and myself.

The 15 acre area, slated for the wastewater reclamation facility, is located across the haul road from the existing water tank. Major portions of the area have been previously disturbed by bulldozing and chain clearing for ranching activities. Consequently, much of the area is clear of rocks and generally flat. The topography consists of gentle slopes with 2 or 3 shallow drainages. Debris piles and dozer berms were observed intermittently throughout the area. Secondary growths of *kiawe* (*Prosopis pallida*) and lantana (*Lantana camara*) occupy most of the area with isolated stands of *wiliwiliw* (*Erythrina sandwicensis*). Large concentrations of Golden crown-beard (*Verbesina enceliodes*) with its yellow flowers also indicate areas that have been previously cleared. In the peripheral areas, large stands of *wiliwili* attest to the undisturbed state of ridges. No surface cultural remains of significance were located in the project area. A ranching wall composed of stacked rock defines the southwestern boundary of the area and modern corrals and pens, made of lumber, are located adjacent to the haul road near the central portion of the northwestern boundary. No further archaeological procedures appear warranted prior to construction of the wastewater treatment facility. Monitoring during construction is recommended.

Major sections of the force main and transmission lines traverse previously developed portions of the Maui Prince Hotel grounds, roadways, or golf course. The remaining segments traverse areas at the golf course boundaries, in between fairways, and undeveloped *mauka* parcels. Here again, no further work is indicated prior to construction since the transmission corridor will traverse areas that have been previously disturbed, such as construction access or existing maintenance roads. An inventory survey currently

pending completion will identify any sensitive areas in the *mauka* parcels. Thus the corridor can be adjusted to avoid remains or appropriate mitigation measures can be undertaken when the final corridor alignment is determined.

The area surrounding the hotel pump station (MP) locality has been previously developed both for hotel and golf course. The area was included in previously completed archaeological studies including data recovery. No further archaeological procedures are recommended for this locality. Any inadvertent discoveries of potential cultural significance shall be promptly reported to the State Historic Preservation Division of the Department of Land and Natural Resources (SHPD/DLNR) after work in the immediate vicinity has been halted.

The lower elevation pump station (ML) is located just inland of the public comfort station and parking area associated with the North Cul-de-Sac. The area is currently unused and consists of typical open land with *kiawe*, lantana, and other dry shrubs and grasses. This area was also included in several of the previous archaeological surveys. No surface archaeological remains occur within the boundaries of the 7500 square foot pump station locality. Again, no further archaeological procedures are warranted. However, the same provision regarding inadvertent discoveries must be made.

The upper elevation pump station (MU) is located in a currently unmodified area northwest of the 17th Tee of the North Course. This area, like the others, has been included in several archaeological studies. No significant remains occur within the boundaries of this pump station locality. No further archaeological procedures are warranted. The inadvertent discovery provision, however, is still applicable here as well.

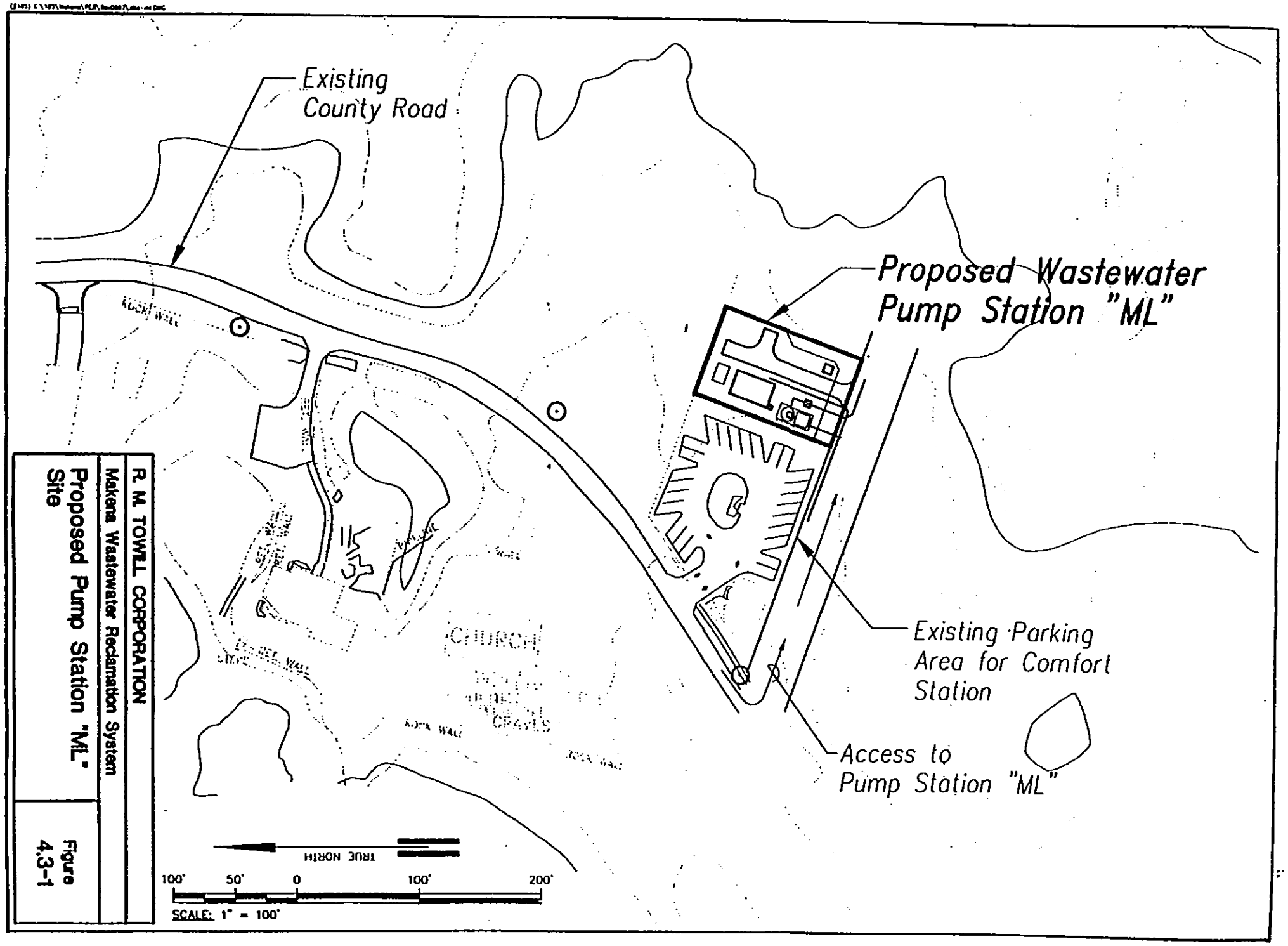
The areas evaluated during this field work are all devoid of any significant cultural remains. Any remains may have been previously destroyed by ground disturbing activities associated with ranching or more recent development activities for the hotel and/or golf course. These circumstances, in addition to the fact that several previous studies have incorporated these areas, deem further pre-construction archaeological procedures unwarranted. Monitoring during construction is recommended only for the 15 acre Water Reclamation Facility.

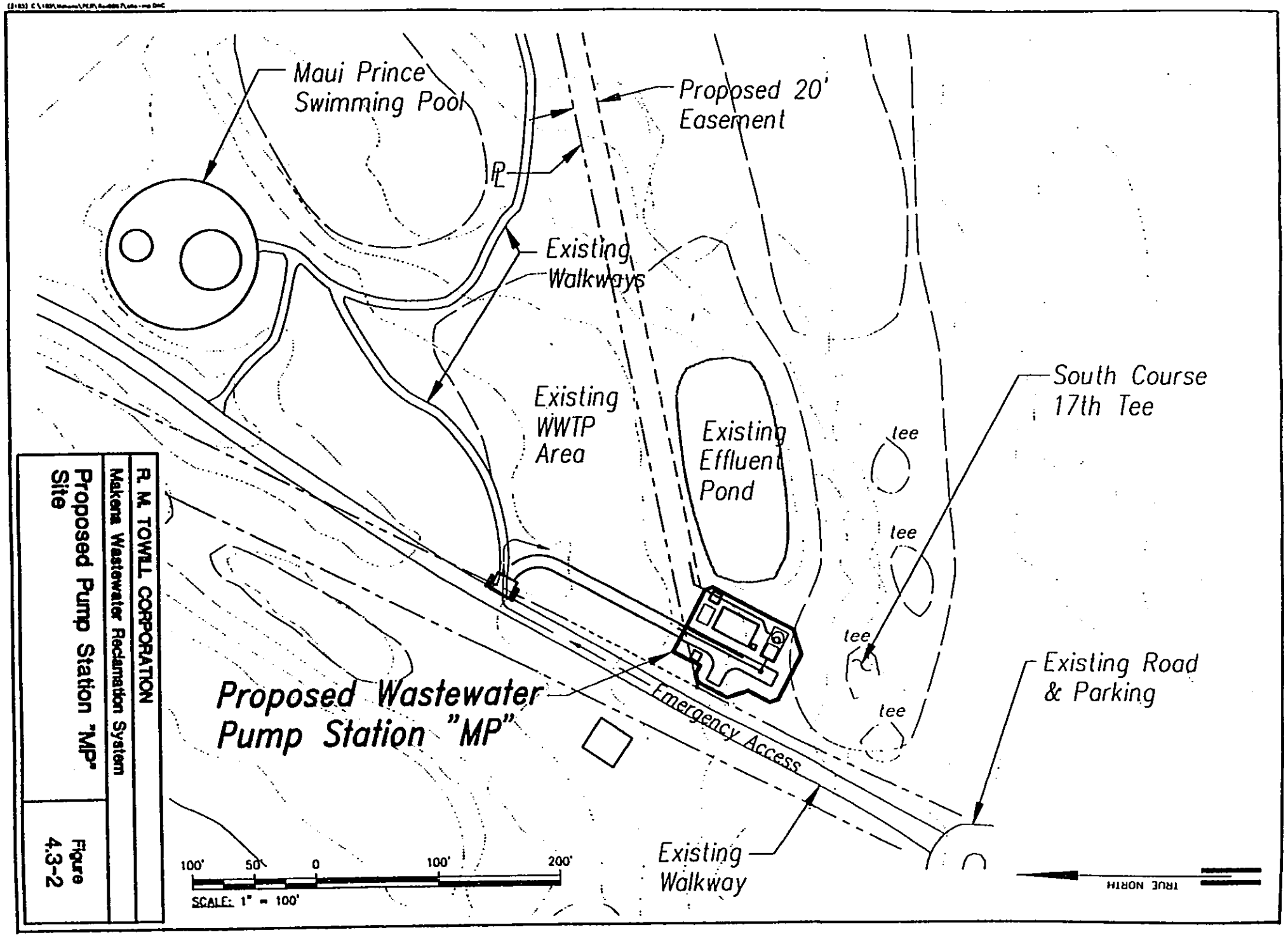
An inventory survey report is currently pending. This report will be abbreviated since much of the introductory background material has been previous covered in other reports. Should you have any questions or comments, please contact me, in Honolulu, at the number listed above.

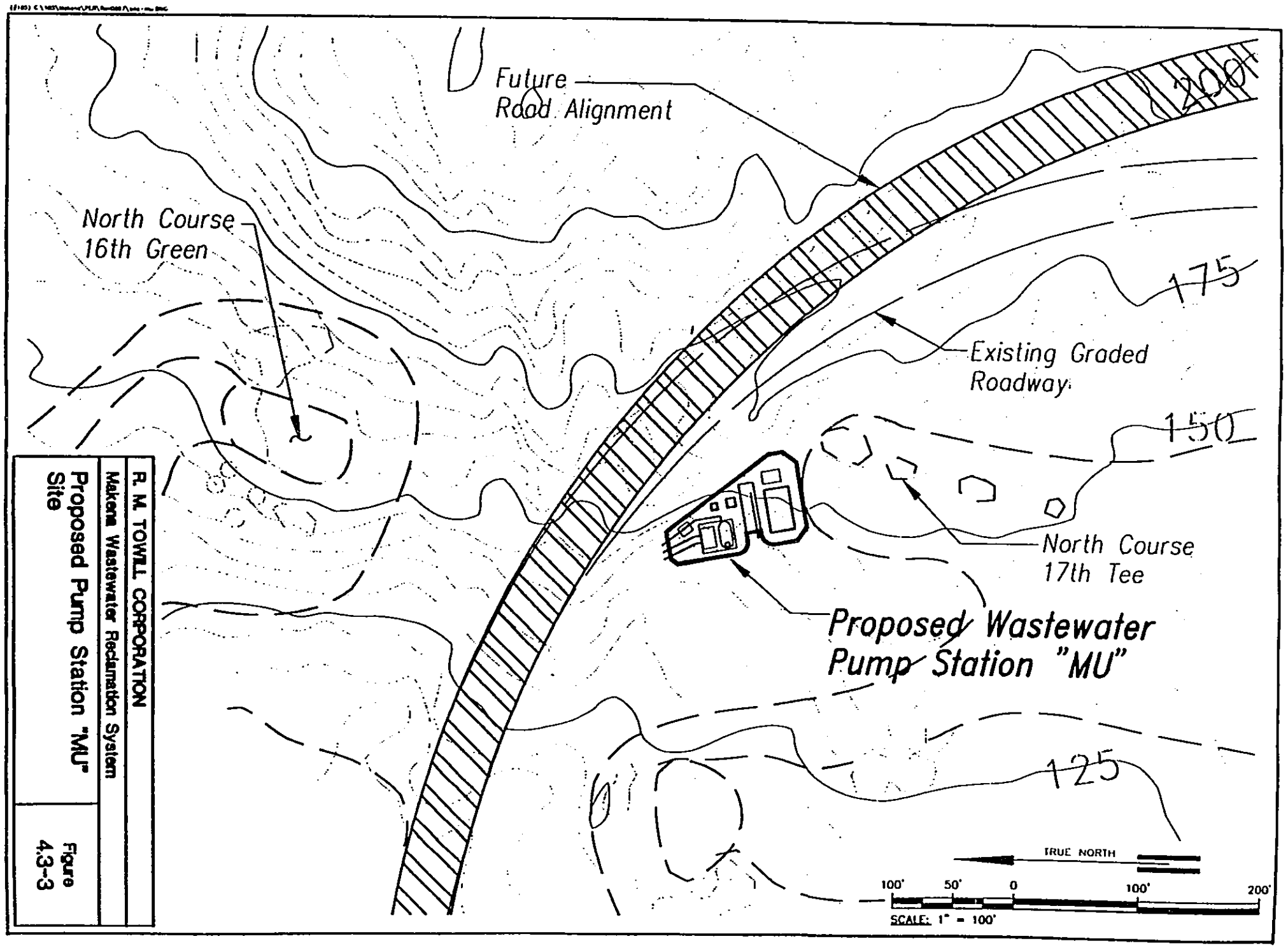
Sincerely,

Aki Sinoto
Consulting Archaeologist

attachment: maps (courtesy R.M. Towill Corp.)


Existing
County Road
Proposed Wastewater
Pump Station "ML"
Existing Parking
Area for Comfort
Station
Access to
Pump Station "ML"
CHURCH
TRUE NORTH
100' 50' 0 100' 200'
SCALE: 1" = 100'
R. M. TOWILL CORPORATION
Makena Wastewater Reclamation System
Proposed Pump Station "ML" Site
Figure 4.3-1


Maui Prince
Swimming Pool
Proposed 20'
Easement
PL
Existing
Walkways
Existing
WWTP
Area
Existing
Effluent
Pond
South Course
17th Tee
tee
tee
tee
tee
Proposed Wastewater
Pump Station "MP"
Emergency Access
Existing Road
& Parking
Existing
Walkway
100' 50' 0 100' 200'
SCALE: 1" = 100'
TRUE NORTH
R. M. TOWILL CORPORATION
Makena Wastewater Reclamation System
Proposed Pump Station "MP" Site
Figure 4.3-2

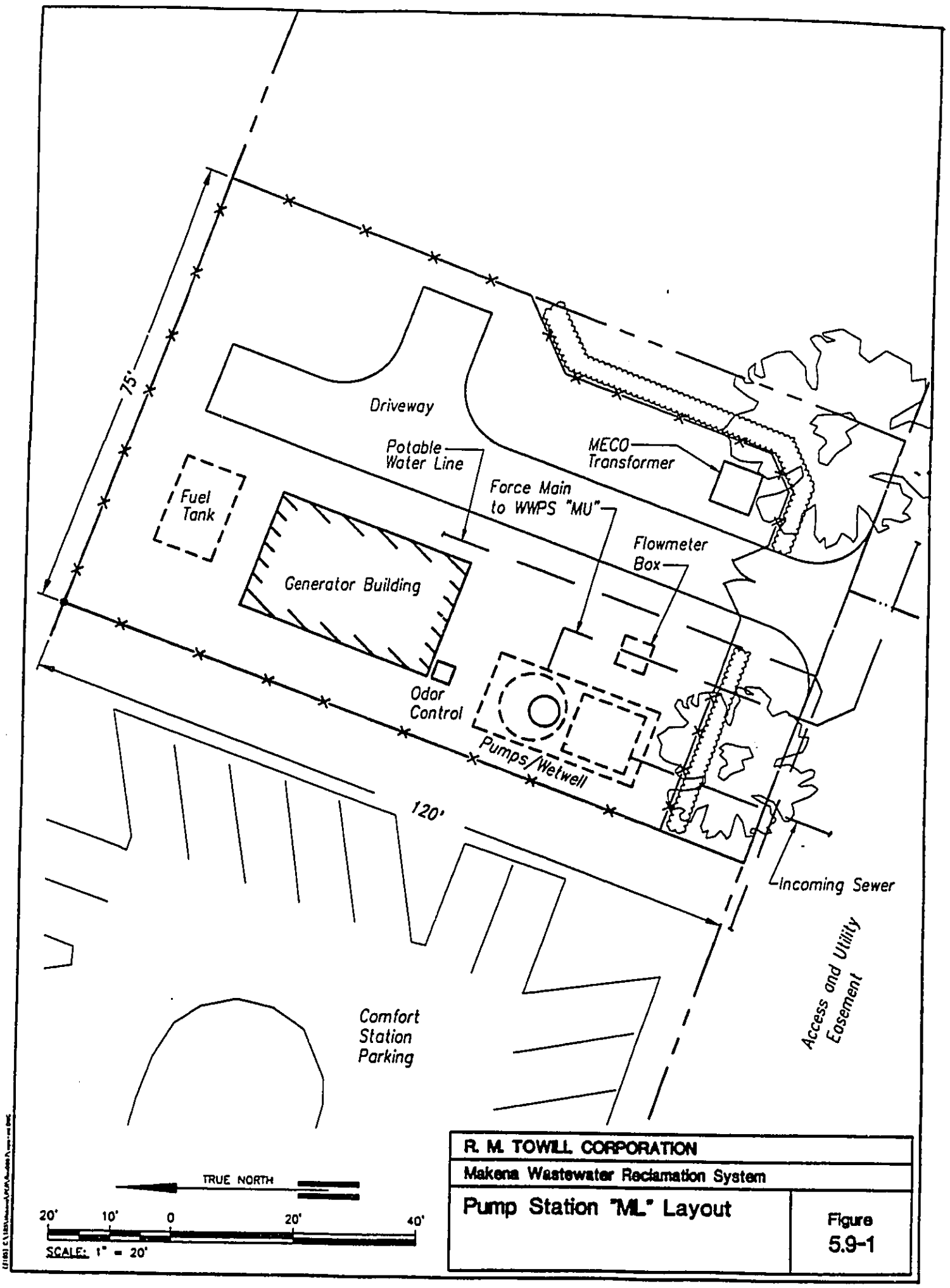


R. M. TOWILL CORPORATION

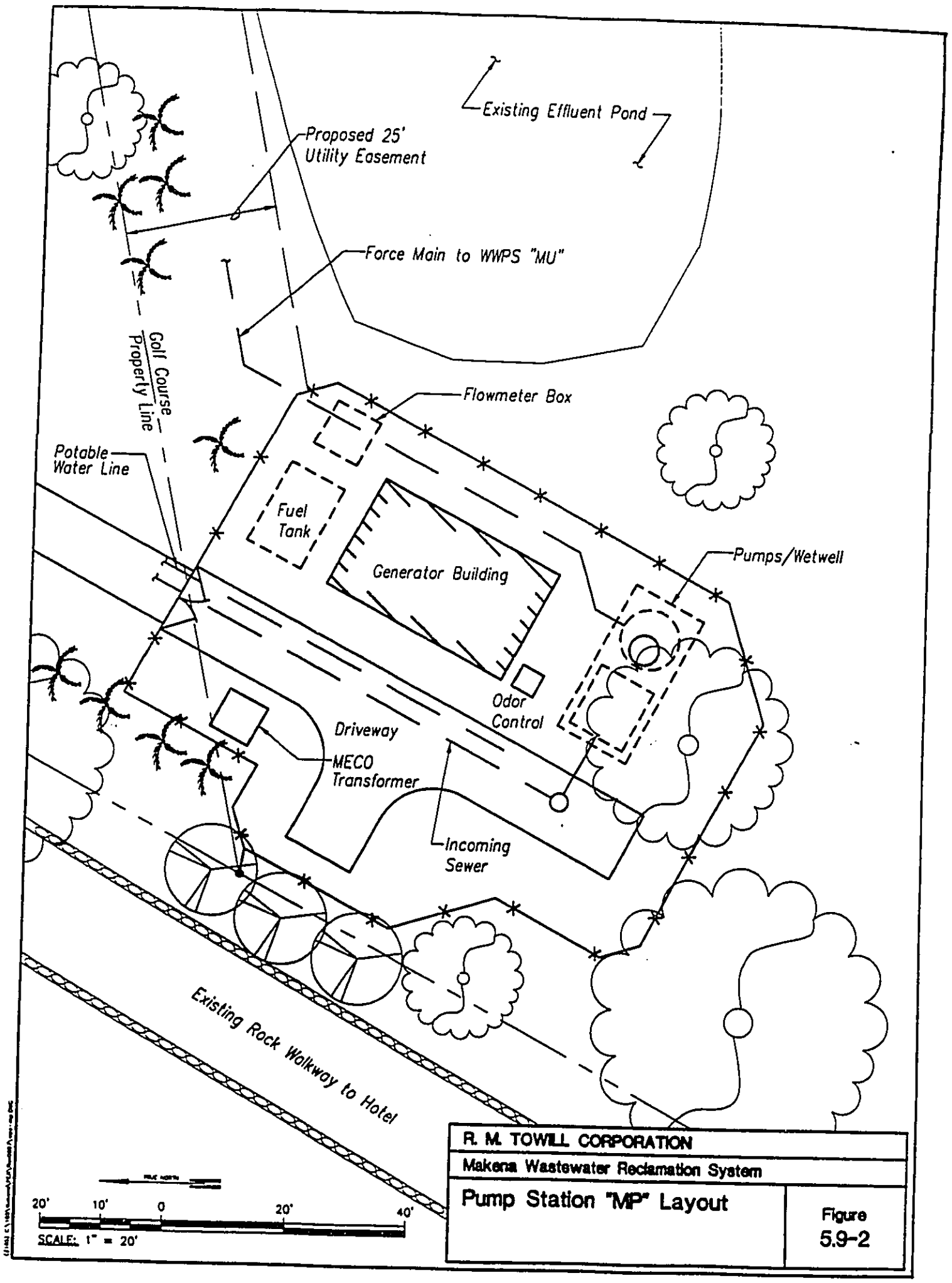
Makena Wastewater Reclamation System

Proposed Pump Station "MU" Site

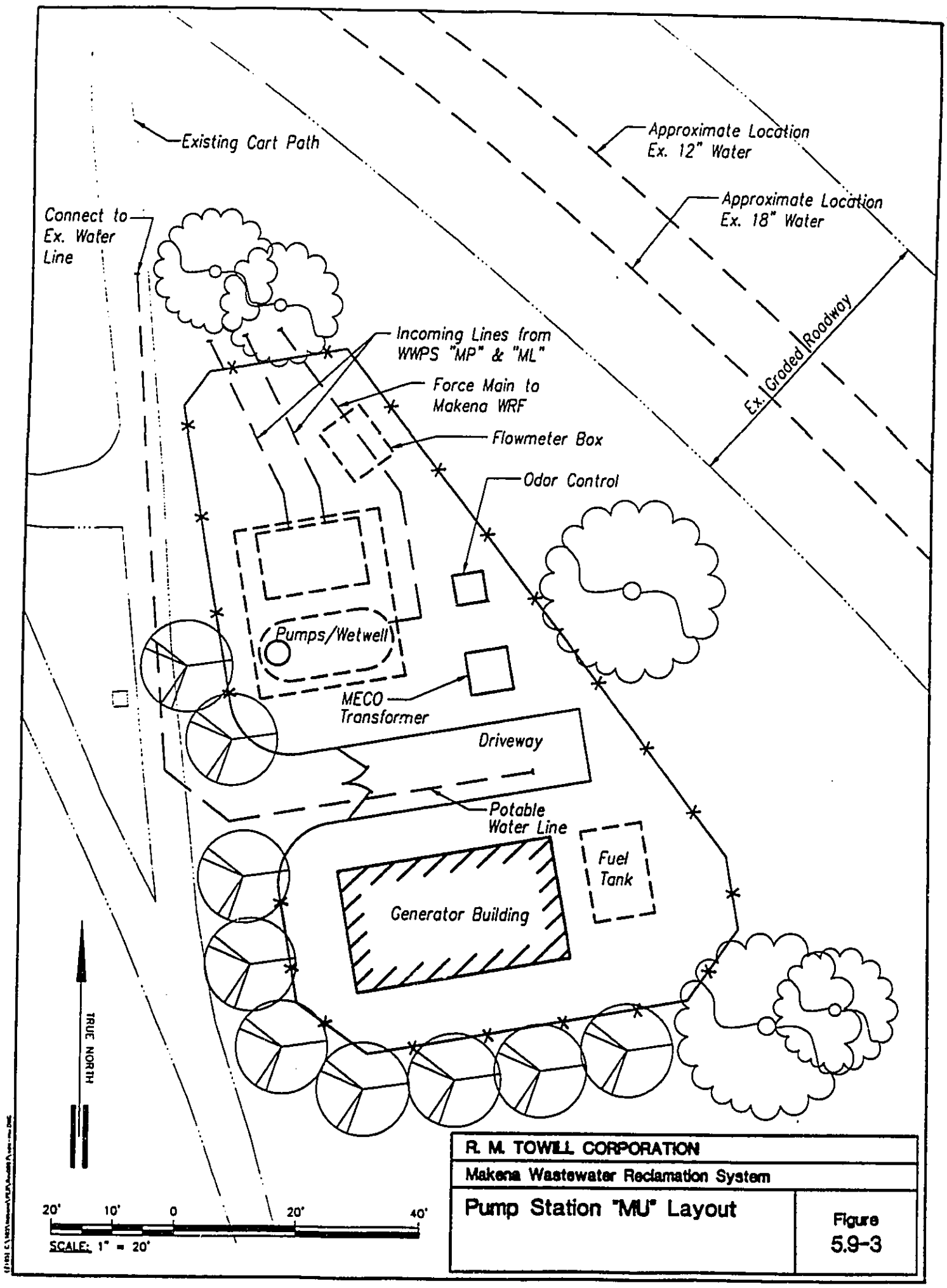
Figure 4.3-3



R. M. TOWILL CORPORATION	
Makena Wastewater Reclamation System	
Pump Station "ML" Layout	Figure 5.9-1



R. M. TOWILL CORPORATION	
Makena Wastewater Reclamation System	
Pump Station "MP" Layout	Figure 5.9-2



R. M. TOWILL CORPORATION	
Makena Wastewater Reclamation System	
Pump Station "MU" Layout	Figure 5.9-3

APPENDIX C
Agencies' and Other Parties' Comments in the Process of Preparing the EA

United States Department of the Interior

FISH AND WILDLIFE SERVICE

PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply Refer To: KAJ

APR 14 1998

Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Rd., Suite 411
Honolulu, HI 96817-4941

Re: Draft Environmental Assessment (DEA) for Makena Resort, Wastewater Reclamation System, Makena, Maui, Hawaii

Dear Ms. Sakoda:

The U.S. Fish and Wildlife Service (Service) has reviewed the October 1997 DEA on the proposed wastewater reclamation system at the Makena Resort. The applicant is the Makena Resort Corporation. The proposed project involves the construction of a wastewater management system to support the Makena Resort. The system would include three wastewater pump stations, a gravity collection system, and interconnecting force mains leading to a treatment facility. The Service offers the following comments for your consideration.

General Comments

The Service believes that impacts to the federally endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) have not been adequately addressed in the DEA. Generally, stilts are attracted to any available open water, puddle size or larger, provided its shallow enough to walk in, at least around its outer reaches. Stilts normally feed on insects that may occur at the settling ponds. We recommend discouraging the stilts from the ponds because of the possible exposure to contaminants and also the potential take from predators like mongoose or feral cats. One way to discourage stilts from the settling ponds is to have the ponds covered. However, this is not a reasonable option as the purpose of the ponds is to allow bacterial breakdown of solid wastes. The Service recommends that stilts be discouraged from using the settling ponds by constructing them with steeply-sloped side walls and a deep base foundation.

It is unclear whether construction activities will occur after sunset, which would require lighting. Both circumstantial observations and experimental evidence show that artificial lighting on or near beaches tends to deter sea turtles from emerging out of the sea to nest, and hawksbill sea turtles (*Eretmochelys imbricata*) are known to occur and nest in the project vicinity.

In addition, the federally endangered dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*) occurs on Maui and nests in Haleakala Crater. Young dark-rumped petrels are inexperienced and have a natural attraction to bright lights. When flying at night they can be temporarily blinded by bright lights and fly into unseen objects such as utility wires, trees, buildings, and automobiles. The Service recommends that all artificial lighting at the project sites be shielded and oriented toward the ground and away from the beach in order to help protect these sensitive species.

Specific Comments

Page 5-3: The possible presence of the endemic Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area of the proposed project is noted. This species was federally listed as endangered on October 13, 1970. Also, federally endangered dark-rumped petrels travel through the proposed project area. The Service recommends that the applicant be required to evaluate project-related impacts to these species and proposed mitigation measures to avoid or minimize any anticipated impacts.

Page 5-4: The federally endangered hawksbill sea turtle is occurs in nearby waters and is known to nest along the beaches of south Maui in the vicinity of the proposed project site. The Service recommends that the applicant be required to evaluate project-related impacts to these species and proposed mitigation measures to avoid or minimize any anticipated impacts.

Summary Comments/ Service Recommendations

The Service believes that appropriate mitigation for potential impacts to the species listed in this letter has not been proposed in the DEA. We recommend that the measures provided above to protect these species be incorporated into the project. Provided that this is done, the Service would concur with a Finding of No Significant Impact (FONSI) for the proposed project.

The Service appreciates the opportunity to comment on the proposed Makena Resort, Wastewater Reclamation System. If you have any questions regarding these comments, please contact Fish and Wildlife Biologist Karen "Kitti" Jensen at 808/ 541-3441.

Sincerely,

for Brooks Harper
Field Supervisor
Ecological Services

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
Telephone: 808 842 1133
Fax: 808 842 1937
eMail: rmtowill@h-one.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

Mr. Brooks Harper
Ecological Services
Fish and Wildlife Service
United States Department of the Interior
P.O. Box 50088
Honolulu, Hawaii 96850

Dear Mr. Harper:

Subject: Your Letter of April 14, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We provide the following comments to your concerns:

General Comments
The proposed settling ponds will be designed with steeply-sloped side walls and a deep base foundation so that the federally endangered Hawaiian stilt (*Himantopus Mexicanus knudseni*) could not be attracted to them. Also, the contractor will schedule work activity between the hours of 8:30 a.m. and 3:00 p.m. to prevent use of an artificial lighting at the project site; therefore, any impact from construction related lighting to the surrounding ecosystem, including the federally endangered dark-rumped petrel, is not anticipated.

Potential impacts from overhead permanent lighting at the project site will be mitigated by shielding the light and orienting it toward the ground and away from the beach. There will be no night lighting at the proposed pump stations. Furthermore, the reclamation facility is situated more than a mile away from the shoreline. No adverse impacts on marine life are anticipated to result from artificial lighting at the project site.

Specific Comments Regarding Hawaiian hoary bat (*Lasiurus cinereus semotus*)
We acknowledge that the Hawaiian hoary bat is not only endemic but also listed as a federal endangered species.

Specific Comments Regarding dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*)
The contractor will schedule work activity between the hours of 8:30 a.m. and 3:00 p.m. to prevent use of an artificial lighting at the project site; therefore, any impact from construction related lighting to the surrounding ecosystem, including the federally endangered dark-rumped petrel, is not anticipated. In addition, potential impacts from permanent lighting at the project site will be mitigated by shielding the light and orienting it toward ground.

Specific Comments on the federally endangered hawksbill sea turtle
Although the federally endangered hawksbill sea turtle is known to nest along the beaches of south Maui in the vicinity of the proposed project site, the site is relatively steep and located mauka of the asphalt-paved roadway Kihei Road, the area's major north and south corridor. In addition, there will be no lighting at the proposed pump stations. The reclamation facility is situated more than a mile away from the shoreline. Permanent lighting at the project site will be mitigated by shielding the light and orienting it toward ground and away from beach. Therefore, the proposed project is not likely to interfere with their habitats.

Your comments and recommendation will be addressed in the Final EA, also, it will be included in the long-term plan for the proposed project. If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

February 26, 1998

Ms. Colette Sakoda
R.M. Towill Corporation
480 Waiakamilo Rd., #411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Subject: Draft Environmental Assessment
Makena Resort
Wastewater Reclamation System
Makena, Maui, Hawaii

The staff of the U.S. Geological Survey, Water Resources Division, Hawaii District, has reviewed the Draft Environmental Assessment, and we have no comments to offer at this time.

Thank you for allowing us to review the report. We are returning it for your future use.

Sincerely,

William Meyer
District Chief

Enc.

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
Telephone: 808 842 1133
Fax: 808 842 1937
eMail: rmtowill@h-one.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

Mr. William Meyer
District Chief
Water Resources Division
U.S. Geological Survey
United States Department of the Interior
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

Dear Mr. Meyer:

Subject: Your Letter of February 26, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that you have no comments to offer.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P O Box 50004
Honolulu, HI
96850

USDA

Our People...Our Islands...In Harmony

March 16, 1998

DIR
NRS
RTT
REC'D MAR 18 1998 RMTC

Ms Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Subject: Draft Environmental Assessment (DEA) - Makena Resort, Wastewater Reclamation System, Makena, Maui, Hawaii

We have reviewed the above mentioned document and have no comments to offer at this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

420 Waiakamilo Road
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R. M. TOWILL CORPORATION
SINCE 1930

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Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

Mr. Kenneth M. Kaneshiro
State Conservationist
United States Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Your Letter of March 16, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that you have no comments to offer.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

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

REPLY TO ATTENTION OF

March 17, 1998

Civil Works Branch

RECD MAR 18 1998 RMTC

Ms. Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Makena Resort Wastewater Reclamation System Project, Makena, Maui (Tax Map Keys 2-1-5: 86, 108, 120; 2-1-8: 108; and, 2-1-7: 68). The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit will not be required for the project. Please contact our Regulatory Section at 438-9258 for further information and refer to file number 980000064.

b. The flood hazard information provided on page 5-3 of the DEA is correct.

Sincerely,

Paul Mizue, P.E.
Chief, Civil Works Branch

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
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Fax 808 842 1937
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May 15, 1998

Mr. Paul Mizue
Chief
Civil Works Branch
U.S. Army Engineer District, Honolulu
Department of the Army
Fort Shafter, Hawaii 96858-5440

Dear Mr. Mizue:

Subject: Your Letter of March 17, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We have contacted the Army Corps Regulatory Section regarding DA permit requirements, and confirmed that the DA permit will not be required for this project.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

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

REPLY TO ATTENTION OF

March 17, 1998

Civil Works Branch

RECD MAR 18 1998 RLTC

Ms. Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Makena Resort Wastewater Reclamation System Project, Makena, Maui (Tax Map Keys 2-1-5: 86, 108, 120; 2-1-8: 108; and, 2-1-7: 68). The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit will not be required for the project. Please contact our Regulatory Section at 438-9258 for further information and refer to file number 980000064.

b. The flood hazard information provided on page 5-3 of the DEA is correct.

Sincerely,

Paul Mizue, P.E.
Chief, Civil Works Branch

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May 15, 1998

Mr. Paul Mizue
Chief
Civil Works Branch
U.S. Army Engineer District, Honolulu
Department of the Army
Fort Shafter, Hawaii 96858-5440

Dear Mr. Mizue:

Subject: Your Letter of March 17, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We have contacted the Army Corps Regulatory Section regarding DA permit requirements, and confirmed that the DA permit will not be required for this project.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

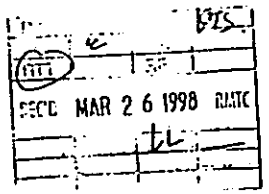
BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

March 25, 1998



Mr. David Blane, Director
Planning Department
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Dear Mr. Blane:

Subject: Draft Environmental Assessment for Makena Resort Wastewater Reclamation System, Maui

Thank you for the opportunity to review the subject document. We have the following comments and questions.

1. The proposed wastewater system is part of the larger Makena Resort development. According to the EIS rules (11-200-7), the environmental effects of the entire development must be assessed.

   In this case, an environmental impact statement was prepared for the entire development in 1975. However, according to the EIS rules (11-200-26 to 29), applicants shall prepare supplemental environmental impact statements whenever the proposed action for which a statement was accepted has been modified to the extent that new or different environmental impacts are anticipated. A supplemental statement shall be warranted when the scope of an action has been substantially increased, when the intensity of environmental impacts will be increased, when the mitigating measures originally planned are not to be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts not previously dealt with.

   Please review the above EIS regulations, the current Makena Resort development plan and the 1975 EIS to determine whether a supplement EIS is required.

2. Please describe whether the proposed development in Increment I and II of the Makena Resort is consistent with the Kihei-Makena Community Plan.

3. Please consult with the State Historic Preservation Division regarding any potential impacts to archaeological resources.

4. Please consult with nearby individuals and groups who may be affected by the project.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Gary Gill
Director

c: R.M. Towill Corp.

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Honolulu, Hawaii 96817-4941
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May 15, 1998

Mr. Gary Gill
Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Your Letter of March 25, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We provide the following comments to your concerns:

1. This Draft EA was prepared specifically to describe the impacts and mitigation measures for the Wastewater Reclamation System in accordance with Chapter 343, HRS, as amended. The Seibu Makena Master Plan Environmental Impact Statement accepted by the County of Maui Planning Commission in 1975, as part of the Kihei General Plan Amendment, contains information describing and evaluating the impacts of the overall Makena resort development. The project will not substantially affect size, scope, intensity, use, or location of the entire development described in the aforementioned EIS.

   The overall development scope of the project has substantially been reduced from a total of 5,969 units to 3,600 units. Therefore, the magnitude of the impacts will be smaller than previously addressed in the 1975 EIS. There are no new circumstances or evidence brought to light that differ or will result in increased environmental impacts not

previously dealt with. The mitigating measures originally proposed will continue to be enforced. Therefore, based on the requirements of the EIS rules (Sections 11-200-26 to 29 of HAR), it is determined that a supplemental EIS will not be necessary.

2. The proposed development in both Increments I and II of the Makena Resort is accommodated in the 1993 Kihei-Makena Community Plan Update which has been adopted by Maui Planning Commission.

3. The State Historic Preservation Division (SHPD), Department of Land and Natural Resources has been consulted during the preparation of the Draft EA. According to the letter from SHPD of March 12, 1998, the SHPD has found the proposed construction project to have "no effect" on known historic sites In addition, archaeological monitoring plans for both the proposed facilities and associated infrastructure developments will be prepared in accordance with SHPD guidelines and submitted for their review and approval.

4. The Draft EA has been sent to nearby private associations and all public libraries on Maui to consult with a wide range of individuals and groups in the area. The following private groups and public libraries have been contacted: Keauhou O Honuaula, Inc.; Makena Community Association; Wailuku Public Library; Hana Public and School Library; Kahului Public Library; Kihei Public Library; Lahaina Public Library; and Makawao Public Library.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

BENJAMIN J. CAYETANO
GOVERNOR

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

MAR 19 1998

(P)1159.8

MAR 23 1998

Ms. Colette Sakoda, Project Manager
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Subject: Draft Environmental Assessment for
Makena Resort, Wastewater Reclamation System
Makena, Maui, Hawaii

Thank you for the opportunity to review the subject draft environmental assessment transmitted by your letter dated February 18, 1998. We have no comments to offer.

If there are any questions, please have your staff contact Mr. Ronald Ching of the Planning Branch at 586-0490.

Sincerely,

GORDON MATSUOKA
Public Works Administrator

RC:jy
c: County of Maui - Planning Dept.
Makena Resort Corp. - R. Figueiroa

420 Waiakamilo Road
Suite 411
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R. M. TOWILL CORPORATION
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May 15, 1998

Mr. Gordon Matsuoka
Public Works Administrator
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka:

Subject: Your Letter of March 19, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that you have no comments to offer.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda
cc: Makena Resort Corp. - R. Figueiroa

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

APR 30 1998

LAWRENCE MIKE
DIRECTOR OF HEALTH

IN REPLY, PLEASE REFER TO

April 22, 1998 98-035/epo

Ms. Colette Sakoda
R. M. Towill Corporation
480 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

Subject: Draft Environmental Assessment
Makena Resort, Wastewater Reclamation System
Makena, Maui
TMK: 2-1-05: 108

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

Wastewater

The proposed wastewater reclamation system includes a gravity collection system, three wastewater pump stations and force mains, a water reclamation facility, and an effluent disposal system.

Our wastewater reclamation concerns have been addressed in the engineer's report. We have no objections to this draft environmental assessment, however, we would appreciate a chance to review the final assessment for compliance with our rules.

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems," and we reserve the right to review the detailed wastewater plans for conformance to applicable rules.

Should you have any questions on this matter, please contact the Planning/Design Section of the Wastewater Branch at (808) 586-4294.

Noise Concerns

1. Through facility design, sound levels emanating from the operation of the wastewater pump station must comply with the provisions of Chapter 11-46, Hawaii Administrative Rules, "Community Noise Control."

2. Construction activities must comply with the provisions of Chapter 11-46, Hawaii Administrative Rules, "Community Noise Control."

   a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the maximum permissible sound levels of the regulations as stated in Section 11-46-6(a).

   b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).

Should there be any questions on this matter, please contact Jerry Haruno, Environmental Health Program Manager, Noise, Radiation & Indoor Air Quality Branch at 586-4701.

Sincerely,

BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

c: WWB
NR&IAQB

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
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eMail rmtowill@lava.net

R. M. TOWILL CORPORATION
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Construction Management

May 15, 1998

Dr. Bruce S. Anderson
Deputy Director
Environmental Branch
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

Subject: Your Letter of April 22, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that the DOH has no objections to this draft EA. In addition, wastewater plans for the proposed project have been reviewed by your office. Please find enclosed copies of a comment letter from DOH and correspondence letter from R.M. Towill Corporation.

With respect to your concerns on noise levels, operator and contractor will comply with the provisions of Chapter 11-46, Hawaii Administrative Rules, "Community Noise Control." A detailed description of noise control measures will be included in contract specifications.

Your comments will be reflected in the Final EA for the proposed project. If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

BENJAMIN J CAYETANO
GOVERNOR OF HAWAII

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

LAWRENCE MIKE
DIRECTOR OF HEALTH

In reply, please refer to
EMO-WB

January 23, 1998

960080
makena2.ltr

Leighton W. K. Lum, Ph.D., P.E.
Chief, Environmental Engineer
Planning, Engineering and Environmental Services
R.M. Towill Corporation
420 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Dr. Lum:

Subject: Prefinal Submittal of Construction Plans
Makena Wastewater Reclamation System
Kihei, Maui, Hawaii

The Wastewater Branch staff reviewed and evaluated the above-mentioned documents on their conformance to Chapter 11-62, Hawaii Administrative Rules and the Guidelines for the Treatment and Use of Reclaimed Water dated November 22, 1993. The following are the Department's comments which must be addressed before approval can be granted:

1. Clarification regarding "aerated lagoons". What is the intended operation of the lagoons? Will this be an extended aeration and completely mixed system similar to the Lihue-Puhi facility? What type of diffusers will be used? A number of existing aerated lagoon facilities within the State are experiencing algae problems. Please provide calculations of the aeration requirements, blower sizing, and estimated sludge production.

2. The plans do not show the piping and pump station requirements conforming with the reuse guidelines. Please confirm if these requirements are stipulated in the specifications. We recommend to include the following in the construction notes: "All new buried transmission piping in the reclaimed water system, including service lines, valves, and other appurtenances shall both be colored purple, suggested color Pantone 522 or equal, and embossed or be integrally stamped/marked "CAUTION" RECLAIMED WATER-DO NOT DRINK," or be installed with a purple identification tape, or a purple polyethylene wrap, suggested color index 77742 violet #16, Pantone 512 or equal.

3. It appears from the design data that the UV dose is 120 Hw-s/sq.cm. The guidelines require a minimum UV dose of 140 Hw-s/sq.cm at maximum week flow and 100 Hw-s/sq.cm at peak flow (maximum day). We also recommend a continuous monitoring of UV dose. This is consistent with the current requirement for continuous chlorine residual requirement. Information regarding UV reactor design as enumerated in page K-6 of the guidelines should be provided.

4. Design data. The data should include a section on the Chemical Addition System. Information such as type of chemicals, dosages, metering pumps & blending system should be provided. What is the set point NTU for automatically starting coagulant addition upstream of the filter?

   The effluent coliform requirement of the Hawaii Reuse Guidelines is fecal coliform not total coliform.

5. Sedimentation tanks. Maximum surface overflow rates should comply with the City and County of Honolulu design standards. For extended aeration process less than 1.0 mgd in size, the maximum overflow rates allowable at design average flow is 200 gpd/sq.ft and 600 gpd/sq.ft for design maximum flow. Design data should indicate overflow rates for average & peak flows.

6. Some of the information in the approved engineering report was unavailable. We request that the following be submitted to us: a) necessary calculations for the significant treatment processes giving their size, capacity loading rates and/or contact times; b) process mass balance showing the inter-relationships of units; and c) emergency back-up and restoration protocol if daily samples of fecal coliform exceeds the R-1 requirements. It should also state where the critical alarms will be received, how the location is moritored by personnel, and who will be notified.

7. Numerous reference are made to technical specifications in the construction plans. We request that you furnish the Department with a copy of the specifications.

   Although not required, it would be easy to review the controls, alarms, and instrumentation if P&IDs (Process & Instrumentation Diagrams) are part of the design documents.

8. Dwg. N705. Instrumentation loop schedule showed turbidimeter at the secondary clarifier effluent. We recommend that the turbidimeter also be located at the filtered effluent. If

2 NTU limit is exceeded, the entire flow needs to be diverted.

9. We would appreciate "half-sized" or 11" X 17" drawings in the next submittal. This aids in our storage.

Should you have any questions, please feel free to contact the Wastewater Branch at 586-4294.

Sincerely,

DENNIS TULANG, P.E.
Chief, Wastewater Branch

TS:erm

R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu HI 96817-4941 (808) 842-1133 Fax (808) 842-1937

March 20, 1998

Mr. Dennis Tulang
Chief
Wastewater Branch
Environmental Management Division
Department of Health
919 Ala Moana Boulevard, 3rd floor
Honolulu, Hawaii 96814

Dear Mr. Tulang,

PROJECT: Makena Wastewater Reclamation System
Kihei, Maui, Hawaii

SUBJECT: Review Comments on Prefinal Construction Plans

The following are our responses to the Department of Health review comments dated 23 January 1998:

1. Process description. The proposed treatment plant can be considered a modified extended aeration facility. The aeration lagoons will operate as completely mixed reactors. Aeration will be provided by fine bubble diffusers suspended from floating air laterals. The diffusers will be sleeve type, EPDM rubber membrane units. Algae growth in the lagoons is not a concern as the process utilizes a mixed liquor concentration of 1,500 to 3,000 mg/l to block sunlight and effectively eliminate algae growth. The Design Calculations for the proposed facility are attached.

2. Piping identification. The mode of identification for the reclaimed water lines will be added to the specifications and construction notes.

3. UV disinfection system. The sizing calculations for the UV system can be found in the attached Design Calculations. A UV intensity sensor and a UV transmission monitor will be provided. The SCADA system will provide continuous monitoring of UV dose.

4. Design data. Information on the chemical addition system will be added to the design data. Coagulants will be added when the turbidity of the secondary effluent exceeds 5 NTU. The secondary effluent will be diverted to the infiltration basin when it's turbidity exceeds 20 NTU. The effluent coliform requirement on the design data sheet will be changed from total to fecal coliform.

5. Sedimentation tanks. Sizing of the secondary clarifiers was based on the design procedure outlined in WEF Manual of Practice No. 8. Hydraulic surges should not be a major problem as the relatively large aeration lagoons (60+ hours HRT at average flows) will provide significant upstream flow equalization and dampening, thereby negating the need for very low overflow

rates at average flow. The overflow rate at average flow has been added to the design data sheet.

6. Information to supplement engineering report. The attached Design Calculations contain the requested mass balances and process design calculations. If fecal coliform values exceed the allowable limit, the standby UV bank will be turned on and the UV system thoroughly checked. Probable causes of Department of Health fecal coliform violations include lamp failure, jacket fouling, biogrowth in the channel and improper sample handling. A detailed description of the emergency back-up and restoration protocol will be included in the Management Reuse Plan.

7. Specifications. The technical specifications and instrumentation schematics will be included in our next submittal (tentatively scheduled for April 1998).

8. Filtered effluent turbidity meter. A filtered effluent turbidity meter will be added.

9. Half-size drawings. We will use half-size drawings for future plan submittals.

Please feel free to call me at 842-1133 if you have any questions or need additional information.

Very truly yours,

LEIGHTON W.K. LUM, Ph.D., P.E.
Chief Environmental Engineer
Planning, Engineering and Environmental Services

cc: Roy Figueiroa (Makena Resort Corp.)

(d:\makena\corr\doh980123)

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

RECD MAR 19 1998 RMTC

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

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
GILBERT COLOMA-AGARAN

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

March 12, 1998

Ms. Colette Sakoda
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4914

LOG NO: 21166
DOC NO: 9803BD07

Dear Ms. Sakoda:

SUBJECT: **Chapter 6E-42 Historic Preservation Review of a Draft EA for the Makena Resort Reclamation Facility**
Papa'anui Abupua'a, Makawao District, Island of Maui
TMK 2-1-08: Portion of 108

This letter is a Historic Preservation review of a draft Environmental Assessment for the Makena Resort Reclamation Facility located in Papa'anui Ahupua'a. Our review is based on reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field check was conducted of the subject property.

Based on the results of an inventory survey presented in a post-field summary letter to Makena Resort Corporation (Sinoto 1997), it appears that the majority of the area has been previously cleared by bulldozers, leaving a historic cattle wall on the southwestern boundary of the project area, and modern wooden cattle pens and corrals on the northwestern boundary. We therefore find the proposed construction project to have "no effect" on known historic sites.

However, archaeological monitoring of grubbing has been recommended by this office within the 15 acre Water Reclamation Facility area (SHPD DOC NO: 9712BD50), due to the possibility of unrecorded sites being located within dense stands of *wiliwili* which precluded intensive survey of intact portions of the rough lava landscape. This recommendation is based on observations from similar settings elsewhere in Makena which have been found to contain the remains of pre-Contact farming and scattered housing. Thus, before construction can begin within the project area, a monitoring plan (scope) should be submitted to our Division for approval. This plan should outline what sort of historic sites are to be expected in different portions of the property, note how these sites will be documented, and present measures which will ensure that adequate time is allotted to the recording of these remains. In addition, we request that these monitoring recommendations be added to the State Historic Preservation Requirements listed on the construction plans submitted to any contractors.

If you have any questions please contact Boyd Dixon at 243-5169.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

cc Ralph Nagamine, Maui County Department of Public Works (fax: 243-7972)
David Blane, Maui County Department of Planning (fax. 243-7634)

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R. M. TOWILL CORPORATION
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May 15, 1998

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: Your Letter of March 12, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that the SHPD has found the proposed construction project to have "no effect" on known historic sites. However, we note in Paragraph three (3) of your letter that you cite the possibility of unrecorded sites being located within the dense stands of *wiliwili* at the 15-acre Wastewater Reclamation Facility area. Our archaeological consultant's letter (dated on June 18, 1997) clearly states that the dense stands of *wiliwili* occur in the adjoining areas and are not part of the project area.

An archaeological monitoring plan covering both the proposed facilities and associated infrastructure developments will be submitted for your review and approval. Also, monitoring recommendations, upon approval of the SHPD, will be added to the State Historic Preservation Requirements listed on the construction plans submitted to project contractors

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda
cc: Makena Resort Corp. - R. Figueiroa

COPY

June 18, 1997

Dr. Boyd Dixon, Maui Staff Archaeologist
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Annex - 130 Mahalani Street
Wailuku, Maui, Hawai'i 96793

Dear Dr. Dixon:

Subject: Archaeological Summary of Proposed Makena Waste Water Reclamation Facility and Associated Infrastructures for the Makena Resort Corp, Makena, Makawao, Maui (TMK 2-1-5:108, 120; -7:68; -8:108)

An archaeological surface survey of the proposed waste water reclamation facility, portions of the force main transmission corridor, and pump locations (Pump Stations MP, ML, and MU) was undertaken on Monday, 9 January 1997 by Jeffrey Pantaleo and myself. The results of this procedure was previously reported in a letter dated March 7, 1997 addressed to Mr. Roy Figueiroa. Further discussions with Dr. Sara Collins of the State Historic Preservation Division on O'ahu following submission of that letter have determined that since major portions of the subject project occur in existing developed areas that have been included in previously completed inventory and data recovery projects and the most recent surface survey resulted in negative findings, a letter providing an archaeological summary of the project area would fulfill the regulatory requirements. The purpose of this letter is to provide the summary data.

The 15 acre area, slated for the wastewater reclamation facility (TMK 2-1-8:108), is located across the haul road from the existing water tank. Major portions of the area have been previously disturbed by bulldozing and chain clearing for ranching activities. Consequently, much of the area is clear of rocks and generally flat. The topography consists of gentle slopes with 2 or 3 shallow drainages. Debris piles and dozer berms were observed intermittently throughout the area. Secondary growths of *kiawe* (*Prosopis pallida*) and lantana (*Lantana camara*) occupy most of the area with isolated stands of *wiliwiliw* (*Erythrina sandwicensis*). Large concentrations of Golden crown-beard (*Verbesina encelioides*) with its yellow flowers also indicate areas that have been previously cleared. In the peripheral areas beyond the project boundaries, large stands of *wiliwili* attest to the undisturbed state of ridges. No surface cultural remains of significance were located in the project area. A ranching wall composed of stacked rock defines the southwestern boundary of the area and modern corrals and pens, made of lumber, are located adjacent to the haul

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road near the central portion of the northwestern boundary. No further archaeological procedures appear warranted prior to construction of the wastewater treatment facility. Monitoring during construction-related, earth-moving activities is recommended. The scope of such procedures would be contingent on a monitoring plan to be prepared for SHPD approval.

Major sections of the force main and transmission lines traverse previously developed portions of the Maui Prince Hotel grounds, roadways, or golf course. The remaining segments traverse areas at the golf course boundaries, in between fairways, and undeveloped *mauka* parcels. Here again, no further work is indicated prior to construction since the transmission corridor will traverse areas that have been previously disturbed, such as construction access or existing maintenance roads. Survey and excavations were previously completed for the existing water tank (Athens and Cordy 1988). An inventory survey currently pending completion (McIntosh, Pantaleo, and Sinoto, pending) will identify any sensitive areas in pertinent portions of the *mauka* parcels. Thus, the corridor can be adjusted to avoid remains or appropriate mitigation measures can be undertaken when the final corridor alignment is determined.

The area surrounding the hotel (MP) pump station locality (TMK 2-1-5:120) has been previously developed both for hotel and golf course. The area was included in previously completed archaeological studies including data recovery (Clark 1974; Cordy 1978; Rogers-Jourdane 1979). No further archaeological procedures are recommended for this locality. Any inadvertent discoveries of potential cultural significance shall be promptly reported to the State Historic Preservation Division of the Department of Land and Natural Resources (SHPD/DLNR) after work in the immediate vicinity has been halted.

The lower elevation (ML) pump station (TMK 2-1-7:68) is located just inland of the public comfort station and parking area associated with the North Cul-de-Sac. The area is currently unused and consists of typical open land with *kiawe*, lantana, and other dry shrubs and grasses. This area was also included in several of the previous archaeological surveys (Denision 1979; Rogers-Jourdane 1979). No surface archaeological remains occur within

COPY

the boundaries of the 7500 square foot pump station locality. Again, no further archaeological procedures are warranted. However, the same provision regarding inadvertent discoveries must be made.

The upper elevation (MU) pump station (TMK 2-1-5:108) is located in a currently unmodified area northwest of the 17th Tee of the North Course. This area, like the others, has been included in several archaeological studies (Clark 1974; Sinoto 1981). No significant remains occur within the boundaries of this pump station locality. No further archaeological procedures are warranted. The inadvertent discovery provision, however, is still applicable here as well.

The areas evaluated during this field work are all devoid of any significant cultural remains. Any surface remains may have been previously destroyed by ground disturbing activities associated with ranching or more recent development activities for the hotel and/or golf course. These circumstances, in addition to the fact that several previous studies have incorporated these areas, deem further pre-construction archaeological procedures unwarranted. Monitoring during construction is recommended only for the 15 acre waste water reclamation facility.

Should you have any questions or comments, please contact me, in Honolulu, at the number listed above.

Sincerely,

Aki Sinoto
Consulting Archaeologist

attachment: list of references cited

fxc: Mr. Roy Figueiroa, Makena Resort Corp

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MAR 19 1998

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

MAR 18 1998

MICHAEL D. WILSON
CHAIRPERSON

ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RICHARD H. COX
HERBERT M. RICHARDS, JR.

EDWIN T. SAKODA
ACTING DEPUTY DIRECTOR

Ms. Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, HI 96817-4941

Dear Ms. Sakoda:

Makena Resort Wastewater Reclamation System
Draft Environmental Assessment

Thank you for the opportunity to review the subject document. We submitted comments to the Land Management Division of DLNR, but they apparently have not been incorporated into the captioned Draft EA. They are repeated below.

The Makena area relies upon potable service from the Iao Aquifer System, which has been overpumped until very recently. The Commission will designate the aquifer as a water management area if this situation recurs. If the aquifer is designated, all groundwater withdrawals to the purveyor would be subject to water use permits. The service and aquifer system area would be subject to a declaration of a water shortage or a water emergency.

The Commission strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. The project appears to be a conservation measure that can relieve demand upon an oversubscribed source (Iao Aquifer). We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

If there are any questions, please contact Charley Ice at 587-0251.

Sincerely,

EDWIN T. SAKODA
Acting Deputy Director

Cl:ss

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@h-one.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

Mr. Edwin T. Sakoda, Acting Deputy Director
Commission on Water Resource Management
State of Hawaii,
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Sakoda:

Subject: Your Letter of March 18, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

The proposed project enables the Makena Resort to reuse treated water for irrigation purposes, which would relieve demand upon the Iao Aquifer System. We acknowledge that all groundwater withdrawals to the purveyor would be subject to the State water use permits and requirements if the aquifer is designated as a water management area. Also, the County of Maui, Department of Water Supply will be including the proposed reclamation system in their Water Use and Development Plan Update.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

BENJAMIN J. CAYETANO
GOVERNOR

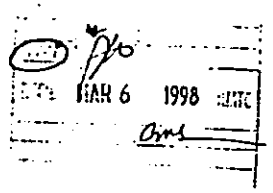
KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MAHAAI
GLENN M. OKIMOTO

IN REPLY REFER TO
STP 8.8459

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

March 4, 1998



Mr. William Spencer
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Attention: Ms. Colette Sakoda

Dear Mr. Spencer:

Subject: Makena Resort Wastewater Reclamation System
Draft Environmental Assessment
TMK: 2-1-05: 86, 108 & 120
2-1-007: 68
2-1-08: 108

Thank you for your transmittal of February 18, 1998.

While our transportation facilities will not be impacted by the subject project, the applicant should be reminded that we are still awaiting a Traffic Impact Analysis Report (TIAR) which reflects the entire Makena Resort Master Plan, including other major developments in the area.

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

420 Waiakamilo Road
Suite 411
Honolulu, Hawaii 96817-4941
Telephone: 808 842 1133
Fax: 808 842 1937
eMail: rmtowill@h-one.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

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

Dear Mr. Hayashida:

Subject: Your Letter of March 4, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that the State DOT has found the proposed construction project to have "no impact" on the State transportation Facilities. A Traffic Impact Analysis Report (TIAR) is currently being prepared and will be submitted for your review.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

DEPARTMENT OF
PARKS AND RECREATION
COUNTY OF MAUI

1580-C KAAHUMANU AVENUE WAILUKU, HAWAII 96793

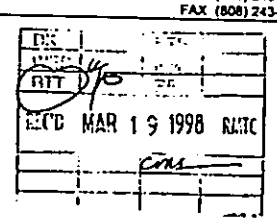
LINDA LINGLE
Mayor

HENRY OLIVA
Director

ALLEN SHISHIDO
Deputy Director

(808) 243-7230
FAX (808) 243-7934

March 16, 1998



Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

SUBJECT: **Makena Resort, Wastewater Reclamation System**
Draft EA

Dear Ms. Sakoda:

We have no objection to the expansion of the Wastewater Reclamation System and feel that future upgrades shall include the effluent treatment of existing beach comfort stations in the area. The existing sewer disposal is by individual sanitation treatment that from time to time is subject to repairs caused by beach action, seepage, or percolation problems.

The proposed Maui Prince and Makena Lower Waste Water Pump Station sites should have construction access roads which will mitigate any impacts to parking and access to Malu Aka Park. Use dust screens as a visual barrier and dust control during construction. Try to include permanent landscaping that serves to screen the facility from view at both pump station sites. Such landscaping will also mitigate any loud machinery sounds.

Lastly, provide additional information how the nearby park facilities, beaches, parking, and beachgoers will be protected from contamination in the event of a break or overflow condition at the waste water pump station sites. Thank you for the opportunity to comment. Should you have any questions feel free to call me at 243-7626.

Sincerely,

HENRY OLIVA
Director

HO:PTM:gu

c: David Blane, Director-Planning Department
Project Files

420 Waiakamilo Road
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Honolulu, Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtow@lava.net

R. M. TOWILL CORPORATION
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Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

Mr. Henry Oliva, Director
Department of Parks and Recreation
County of Maui
1580-C Kaahumanu Avenue
Wailuku, Hawaii 96793

Dear Mr. Oliva:

Subject: Your Letter of March 16, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that you have no objections to the proposed project. The following has been prepared to address your concerns:

1. With respect to your requests to include the treatment of existing beach comfort stations, the proposed wastewater treatment system will have enough capacity to handle additional wastewater generated from these comfort stations.

   There are two existing comfort stations near the proposed pump stations ML and MP, which can be connected to the proposed system. These two comfort stations are located close enough to the pump stations, and the proposed collection system will be deep enough to accommodate sewer connections from these comfort stations.

2. Construction operations will temporarily increase traffic in the area. All pump stations will be provided with construction access roads and parking to mitigate impacts on the existing uses near the project sites. If necessary, traffic control measures will be provided to mitigate the effects of increased traffic. Also, during the actual construction, mitigation measures will be taken to reduce fugitive dust and ensure noise control. The project will include extensive landscaping which will mitigate impacts on the area's aesthetics and visual quality.

For more information, please refer to Sections 3.2.1 & 3 and 5.1.10 & 13.

3. Any wastewater discharge to the surrounding area from the Makena Resort Wastewater Reclamation facilities is considered a spill. Depending on its volume and location, the spill may have to be reported to the State Department of Health. A number of features have been incorporated into the design of the facilities to reduce the risk of wastewater spills. These include:

- Standby Pumps: All pumping facilities are equipped with a standby pump equaling capacity to the largest of the main pumping units.
- Emergency Generators: The pump stations and treatment plant are equipped with diesel powered generators to provide standby electric power to pump peak flows. Operation of the generators is automatic upon commercial power failure.
- SCADA System: A computer based control system will provide 24 hour monitoring of the wastewater facilities.
- O & M Manuals: The O & M manuals will outline procedures to be implemented during emergency conditions and potential spill situations. The objective of these procedures will be to minimize impacts to the public and the environment.

Your comments will be reflected in the Final EA for the proposed project. If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

LINDA LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

Telephone: (808) 243-7845
Fax: (808) 243-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

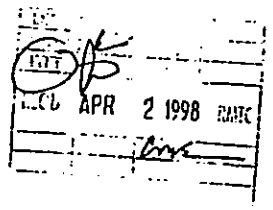
EASSIE MILLER, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

Solid Waste Division

March 30, 1998



Ms. Colette Sakoda
R. M. Towill Corporation
480 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Ms. Sakoda:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
MAKENA RESORT - WASTEWATER RECLAMATION SYSTEM
TMK (2) 2-1-005:086, 108, 120; 2-1-008:108; 2-1-007:068

We reviewed the subject submittal and have the following comments.

1. Section 3.2.3., Page 3-5, states sludge will be hauled for disposal. The EA should name the disposal site and indicate what tests will be performed on sludge prior to disposal.

2. A detailed drainage report and an erosion control Best Management Practices (BMP) plan shall be submitted with the construction plans for review and approval prior to issuance of grading or building permits. The drainage report shall include hydrologic and hydraulic calculations and the schemes for disposal of runoff waters. It must comply with the provisions of the "Rules for Design of Storm Drainage Facilities in the County of Maui" and must provide verification that the grading and runoff water generated by the project will not have an adverse effect on adjacent and downstream properties. The BMP plan shall show the location and details of structural and non-structural measures to control erosion and sedimentation to the maximum extent practicable.

3. Off-street parking, loading spaces, and landscaping shall be provided per Maui County Code Chapter 19.36.

If you have any questions, please call David Goode at 243-7845.

Sincerely,

for CHARLES JENCKS
Director of Public Works
and Waste Management

DG:co/mt
S:\LUCA\CZM\WRS.

LINDA LINGLE
Mayor
CHARLES JENCKS
Director
DAVID GOODE
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration
EASSIE MILLER, P.E.
Wastewater Reclamation Division
LLOYD P.C.W. LEE, P.E.
Engineering Division
Solid Waste Division
BRIAN HASHIRO, P.E.
Highways Division

March 31, 1998

Ms. Colette Sakoda
R.M. Towill Corporation
480 Waiakamilo Road, #411
Honolulu, HI 96817-4941

RECEIVED
APR 3 1998

Dear Ms. Sakoda:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
MAKENA RESORT - WASTEWATER RECLAMATION SYSTEM
TMK (2) 2-1-005:086, 108, 120; 2-1-008:108; 2-1-007:068

After additional review of the subject submittal, we provide the following additional comment.

1. Though not specifically discussed in any of the reports, it is our understanding that the entire wastewater system (pipes, pump stations, treatment plan, and effluent reuse system) will not be owned, operated, and maintained by the County of Maui.

If you have any questions, please contact Sam Bautista at 243-7427.

Sincerely,

CHARLES JENCKS
Director of Public Works
and Waste Management

SB:sb
33198-2.ltr

420 Waiakamilo Road
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Honolulu, Hawaii 96817-4941
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eMail rmtowill@h-ace.com

R. M. TOWILL CORPORATION
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Construction Management

May 15, 1998

Mr. Charles Jencks, Director
Department of Public Works and Wastewater Management
County of Maui
200 South High Street
Wailuku, Hawaii 96793

Dear Mr. Jencks:

Subject: Your Letter of March 30 and 31, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We provide the following comments to your concerns:

1. The sludge removed from the facility will be hauled to either a county landfill or a composting facility. Sludge disposal shall be in accordance with the County Landfill Guidelines or as directed by the operators of the composting facility. Sludge testing will be performed in accordance with the requirements of the disposal site.

   Each lagoon can hold approximately 85 dry tons of solids. Storage times in the sludge lagoons will range from about eight (8) years under initial flow conditions to one (1) year at full plant capacity.

2. An appropriate drainage report and erosion control plan as well as the construction plans will be submitted to your office for review and approval prior to issuance of grading or building permit. We will also be furnishing a BMP plan when NPDES permits are applied for.

3. Adequate loading spaces and landscaping will be provided at all pump stations and reclamation facility. Off-street parking will be provided within the reclamation facility site. As for the pump stations, there will be adequate space within the each site to accommodate service vehicle parking Therefore, no

impacts on the surrounding parking conditions are anticipated to result from the project.

4. The Makena Wastewater Reclamation System will be a privately owned facility. The system will be operated and maintained by the Makena Resort Corporation or its designee.

Your comments will be reflected in the Final EA for the proposed project. If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109
Telephone (808) 243-7816 • Fax (808) 243-7833

March 3, 1998

Ms. Colett Sakoda
R.M. Towill Corporation
480 Waikamilo Rd, #411
Honolulu, Hawaii 96817-4941

Re: Draft Environmental Assessment for Makena Resort, Wastewater Reclamation System

Dear Ms. Sakoda,

Thank you for the opportunity to review this Draft Environmental Assessment. The Department of Water Supply has already commented on this Draft EA as a part a combined Special Management Area Permit, Conditional Permit, and Special Use Permit application to the Maui Planning Commission. Please find enclosed a copy of our comments to the Maui Planning Department.

If you need more information, please contact our Water Resources and Planning Division anytime at (808) 243-7199.

Sincerely,

David Craddick
Director

wef C:\MYDOCU~1\WILL\SPLAN\MGRESPON~1\MAKENWR2.WPD

attachment:
Comments to Maui Planning Department, dated February 18, 1998

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109
Telephone (808) 243-7816 • Fax (808) 243-7833

February 18, 1998

Mr. David Blane, Director
County of Maui
Planning Department
250 South High Street
Wailuku, Maui, Hawaii 96793

Re: I.D.: SU2 970011, CP 970006, SM1 970023
TMK: 2-1-008:por 108
Project Name: Makena Resort Reclamation Facility

Dear Mr. Blane,

Thank you for the opportunity to review this application. The Department of Water Supply has the following comments.

Consumption
The proposed facility will use approximately 15,000 gpd of potable water. However, the use of reclaimed water for landscape irrigation and other non-potable uses should offset potable water use. Domestic, fire, and irrigation calculations will be reviewed in detail during the development process.

Source
This project is served by the Central Maui System. The major source of water for this system is the Iao Aquifer. Rolling annual average groundwater withdrawals from the Iao Aquifer as of February 1, 1998 were 19.24 MGD. The regulatory sustainable yield of this aquifer is 20 MGD. On August 13, 1997, the State Commission on Water Resource Management (CWRM) elected not to designate Iao Aquifer as a State Groundwater Management Area. However, if rolling annual average withdrawals exceed 20 mgd, CWRM will designate Iao Aquifer. The Department is implementing a plan to mitigate withdrawals. No moratorium is currently in effect. Nevertheless, the applicants should be made aware that the timing of this project may be affected with possible delays until new sources can be brought on line. No guarantee of water is granted or implied as a result of these comments or the approval of the requested permits. Water availability will be reviewed at the time of application for meter or meter reservation.

System
The applicants should ensure that there is no possibility of cross-connections between the proposed reclaimed distribution system and any brackish or potable water systems. The applicants should

contact our engineering division at 243-7835 as soon as possible to discuss required back-flow prevention and other measures.

Water Quality

In order to protect groundwater and surface water resources, DWS recommends that the applicant utilize Best Management Practices (BMPs) designed to minimize infiltration and runoff from all irrigation operations. We have attached sample BMPs for golf course operations.

Conservation

To further conserve water resources, the applicant should refer to the attached documents and consider these measures:

Eliminate Single-Pass Cooling: Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. These units pass water once-through for cooling, and then dispose of the water into the drain. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.

Utilize Low-Flow Fixtures and Devices: Maui County Code Subsection 16.20A.680 requires the use of low flow water fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs.

Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.

Use Climate-adapted Plants: The project site is located in "Maui County Planting Plan" - Plant Zones 3 and 5. Please refer to the "Maui County Planting Plan", and to the attached. We encourage the applicants to consider using climate-adapted and salt-tolerant native plants. Native plants adapted to the area, conserve water and further protect the watershed from degradation due to invasive alien species.

Prevent Over-Watering By Automated Systems: Provide rain-sensors on all automated irrigation controllers. Check and reset controllers at least once a month to reflect the monthly changes in evapotranspiration rates at the site. As an alternative, provide the more automated, soil-moisture sensors on controllers.

If you need more information, please contact our Water Resources and Planning Division anytime at (808) 243-7199.

Sincerely,

David Craddick
Director

wef [illegible]

attachments:
"Some of Maui's Native and Polynesian Plants"
"Hawaiian Alien Plant Studies - Pest Plants of Native Hawaiian Ecosystems"
Ordinance 2108 - An ordinance amending Chapter 16.20 of the Maui County Code, pertaining to the plumbing code"
"XERISCAPE - Water Conservation through Creative Landscaping"
"A Checklist for Water Conservation Ideas for Cooling"
Selected BMPs from "Hawaii's Coastal Nonpoint Pollution Control Program Management Plan"

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R. M. TOWILL CORPORATION
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Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

May 15, 1998

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

Dear Mr. Craddick:

Subject: Your Letter of March 3, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

We acknowledge that the use of reclaimed water for landscape irrigation and other non-potable uses should offset potable water use. The detailed domestic, fire, and irrigation calculations will be provided prior to issuance of building permit. Also, we acknowledge the possible effects on the water supply in the event that the State Commission on Water Resources Management (CWRM) should designate the Iao Aquifer as a State Groundwater Management Area.

The project will ensure that there will be no possibility of cross-connections between the proposed reclaimed distribution system and any brackish or potable water systems The project will comply with the DWS guidelines and requirements, including requirements for back-flow prevention. BMP plans will be provided when NPDES permits are applied for. Also, we will consider adapting the conservation measures suggested in your letter.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

ISAAC DAVIS HALL
ATTORNEY AT LAW
2087 WELLS STREET
WAILUKU, MAUI, HAWAII 96793
(808) 244-9017
FAX (808) 244-6775

OF COUNSEL
G. RICHARD GESCH

MAR 24 1998

March 23, 1998

Via Facsimile and U.S. Mail
808-842-1937

Ms. Colette Sakoda
R.M. Towill Corporation
420 Waiakamilo Rd., Suite 411
Honolulu HI 96813-4941

Re: Draft Environmental Assessment for Makena Resort, Wastewater Reclamation System, Makena, Maui, Hawaii

Dear Colette Sakoda:

This letter is written on behalf of Hui Alanui o Makena and Keauhou o Honua'ula, Inc. We have the following comments on the Draft Environmental Assessment ("DEA") for Makena Resort, Wastewater Reclamation System:

1. Settlement Agreement Obligations

Hui Alanui o Makena and the Makena Resort entered into a Settlement Agreement years ago. One term of this Settlement Agreement is that representatives of the Resort are to meet with the Board of Directors of Keauhou o Honua'ula, Inc. on a quarterly basis to discuss all proposed development plans for the Resort. These quarterly meetings have not taken place. Neither has the Makena Resort sent to Keauhou any updated development plans on a quarterly basis. Since the pace of developments appears to be quickening, we believe that it is important, at least from this time forward, that these quarterly meetings and disclosures take place.

2. Proceeding by Way of Multiple Environmental Assessments

We do not believe that it is appropriate to proceed with new proposed developments via a succession of Environmental Assessments as opposed to an Environmental Impact Statement or a Supplemental Environmental Impact Statement. This is especially true for infrastructural improvements such as the proposed wastewater reclamation system. Our state's environmental regulations explicitly recognize that infrastructural improvements tend to induce secondary impacts which should be addressed. This is the case here as well.

The wastewater reclamation system is designed to accommodate anticipated flows for the full build-out of the Makena Resort. The development which this system will facilitate is not described adequately anywhere in the DEA. The areas covered by increments I and II are shown in Figure 2-2; however what is included within these increments and the timing of these projects are not described adequately. Table 3-1 shows how wastewater flows were calculated based upon proposed businesses, hotels, multi-family units and single family units which together comprise 1,950 dwelling units.

The design average flow capacity of the existing system is 123,000 gallons per day. The design average wastewater flow for the improved system is 689,000 gallons per day, an increase of over five times. The impacts of this development as a whole cannot be segregated from the infrastructural improvements for that development. KSOA v. County of Maui, 86 Haw. 66, 947 P.2d 378 (1997).

3. Property Owned by Keauhou o Honua'ula, Inc.

Keauhou o Honua'ula, Inc. owns property which adjoins what is described as Increment I of the proposed build-out of the Makena Resort. A future wastewater pump station is proposed to be located nearby. Keauhou o Honua'ula, Inc. has serious concerns about the location of the pump station. The environmental impacts of this particular pump station have nowhere been addressed in this DEA.

4. Particular Impacts of Concern

a. Archaeological Concerns

The archaeological assessment included in Appendix B is inadequate. Hui Alanui o Makena and Keauhou o Honua'ula, Inc. are vitally concerned with archaeological resources. These should have been discussed in advance in the quarterly meetings.

b. Water Quality

The water quality analyses are inadequate. Pumping wastewater into the ground near the ocean will have potentially adverse impacts on the water quality of near shore ocean waters. The four reports issued by Marine Resource Consultants should have been shared with Keauhou o Honua'ula, Inc.

c. Noise

Keauhou o Honua'ula, Inc. is concerned about the noise created by the pump station which is proposed in the future to be located near its land. This has not been adequately addressed in the DEA.

Based upon the foregoing, there is no basis for concluding that this project will not have any significant adverse impacts. Instead, if our environmental regulations are appropriately applied, a Supplemental EIS should be prepared.

Please contact me if you have any questions about any of the above. I look forward to hearing from you.

Sincerely yours,

Isaac Hall

IH/jp
cc: Keauhou o Honua'ula, Inc.
Hui Alanui o Makena
Roy Figueiroa
OEQC

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May 15, 1998
Mr. Issac Davis Hall
2087 Wells Street
Wailuku. Maui, Hawaii 96793

Dear Mr. Hall:

Subject: Your Letter of March 4, 1998 Regarding the Draft Environmental Assessment for the Makena Resort Wastewater Reclamation System, Makena, Maui

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Makena Resort Wastewater Reclamation System.

The following has been prepared to address your concerns:

1. Settlement Agreement Obligations
Please refer to the attached letter prepared by Mr. Roy Figueiroa of Makena Resort Corporation.

2. Proceeding by Way of Multiple Environmental Assessments
This Draft EA was prepared specifically to describe the impacts and mitigation measures for the Wastewater Reclamation System in accordance with Chapter 343, HRS, as amended. The Seibu Makena Master Plan Environmental Impact Statement accepted by the County of Maui Planning Commission in 1975, as part of the Kihei General Plan Amendment, contains information describing and evaluating the impacts of the overall Makena resort development. The project will not substantially affect size, scope, intensity, use, or location of the entire development described in the aforementioned EIS. Furthermore, the overall development scope of the project has substantially been reduced from a total of 5,969 units to 3,600 units. Therefore, the magnitude of the impacts will be smaller than previously addressed in the 1975 EIS.

3. Property Owned by Keauhou o Honua'ula, Inc.
The indicated location of the pump station is only temporarily set for the purpose of this study. The actual location and its effects will be determined and discussed when Increment II is proposed; however, at this point the plans for Increment II development are preliminary and location of the pump station is not fixed. We will be discussing the plans with you and your organization as they are developed.

4. Particular Impacts of Concern
   a. Archaeological Concerns
   The State Historic Preservation Division (SHPD), Department of Land and

Natural Resources has been consulted during the preparation of the Draft EA. According to the letter from SHPD of March 12, 1998, the SHPD has found the proposed construction project to have "no effect" on known historic sites. In addition, an archaeological monitoring plan covering both the proposed facilities and associated infrastructure developments will be prepared in accordance with SHPD guidelines.

b. Water Quality

The Makena Wastewater Reclamation System does not pump raw wastewater into the ground, nor is the effluent disposed of via injection wells. Highly treated, DOH approved effluent will be used to irrigate the golf courses. The application rate has been reviewed and complies with DOH's Guidelines for Treatment and Use of Reclamation Water. The application rate is designated to have remnant nutrients in the effluent absorbed by the irrigated vegetation.

c. Noise

Since the location of the pump station has not yet been determined, it is difficult to assess its impacts on the adjoining property; however, noise impacts on the area surrounding the reclamation system would generally be caused by the proposed emergency generator system and wastewater pumps. Mitigative measures for the emergency generator include the use of intake and exhaust silencers into the generator room consisting of duct work and sound attenuators, exhaust muffler and discharge silencer in series, and acoustical walls and ceiling panels for the generator room. Mitigative measures for the wastewater pumps include acoustical walls and ceiling panels. Furthermore, the pumps will be situated underground.

There are no new circumstances or evidence brought to light that differ or will result in increased environmental impacts not previously dealt with. The mitigating measures originally proposed will continue to be enforced. Therefore, based on the requirements of the EIS rules (Sections 11-200-26 to 29 of HAR), it is determined that a supplemental EIS will not be necessary.

If you have any questions, please contact me at (808) 842-1133.

Sincerely,

Colette Sakoda

cc: Makena Resort Corp. - R. Figueiroa

MAKENA RESORT CORP.

APR 15 1998

April 13, 1998

Isaac D. Hall, Esq.
2087 Wells Street
Wailuku, Maui, Hawaii 96793

Re: Draft Environmental Assessment for Makena Resort
Wastewater Reclamation System

Dear Mr. Hall:

The following is in response to comments contained in paragraph 1 of a letter from you to Ms. Colette Sakoda, dated March 23, 1998, with regard to the above-referenced matter. Pursuant to the Settlement Agreement between Seibu Hawaii, Inc., now known as Makena Resort Corp., and Hui Alanui O'Makena in July 1987, Makena Resort Corp. agreed to meet on a quarterly basis with the Board of Directors of Keauhou O Honuaula, Inc. (the "Corporation") with regard to the planning of future development at the Makena Resort. From time to time, meetings have been held by representatives of the Makena Resort with representatives of the Corporation. If you are aware, the meetings have been held on an irregular basis with no formal schedule adhered to by the parties. During our last meeting on August 21, 1997, we indicated to representatives of the Corporation that we had plans to proceed with the development of a private wastewater reclamation plant in the Makena region. We indicated that we would be more than happy to discuss said plans, however, no such request for a follow up meeting was expressed by the representatives of the Corporation. Notwithstanding, in the spirit of cooperation, we did ask our consultant, R.M. Towill Corporation, to include Keauhou O Honuaula, Inc. on a list of interested parties with regard to notice of the filing of the draft environment assessment.

If you would like more further detailed information with regard to the proposed wastewater reclamation system being developed, please contact the undersigned such that we may schedule a convenient time to meet to discuss the same.

Very truly yours,

MAKENA RESORT CORP.

Roy Figueiroa
Assistant General Manager

ETM:RF:ca

c: Colette Sakoda
Keauhou O Honuaula, Inc.
Hui Alanui O Makena
Eric Machara

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