

**Miki Basin Industrial Park  
Environmental Assessment**

**Exhibit H**

**Wastewater Master Plan**

**PŪLAMA LĀNA`I MIKI BASIN  
200 ACRE INDUSTRIAL PARK**

Lana`i, Hawai`i

**WASTEWATER MASTER PLAN**

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  - 2. City and County of Honolulu, Department of Wastewater Management, Design Standards of the Department of Wastewater Management Volume 1, July 1993

**I. INTRODUCTION**

The Wastewater Master Plan for Pūlama Lāna`i Miki Basin 200-Acre Industrial Park provides the basic information for the design of the wastewater treatment system for the Miki Basin 200-Acre Industrial Park, herein referred to as the "Industrial Park", based on zoning requirements. The purpose of the master plan is to identify the projected wastewater flows from the development.

The Miki Basin 200 Acre Industrial Park consists of approximately 200 acres of agricultural zoned lands. Pūlama Lāna`i is in the process of rezoning the area for light and heavy industrial lands. The project area is located directly south of Lāna`i Airport within the Palawai Irrigation Grid (see **Exhibit 1: Location Map**). The majority of the proposed Industrial Park is currently undeveloped with the exception of the Maui Electric Company (MECO) Miki Basin substation and a portion of the 20-acre approved subdivision which is currently used by Pūlama Lāna`i. Pūlama Lāna`i is in the process of finalizing condominium documents for the 20-acre industrial condominium subdivision. A timeline for development of the 20-acre subdivision has not been established.

**II. EXECUTIVE SUMMARY**

There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of Miki Basin. The construction of onsite Individual Wastewater Systems (IWS), decentralized Wastewater Treatment Plants (WWTP) and collection systems will be required to support development activity.

Since development plans for the Industrial Park are not yet available, proposed wastewater flows for buildout of the Industrial Park is based on the proposed land use and an estimated developable area for each parcel. The developable area of each parcel estimates that up to 70 percent of the total parcel area will generate wastewater flows; the remaining 30 percent will consist of areas with no wastewater flows such as roads and parking areas. The proposed average wastewater flow for full buildout of the Industrial Park is 365,904 gpd.

**III. EXISTING WASTEWATER SYSTEM**

There is currently no existing County or privately owned or operated wastewater treatment system in the vicinity of Miki Basin. Wastewater is currently treated via onsite individual wastewater systems (IWS).

**IV. LAND USE**

Pūlama Lāna`i is in the process of rezoning approximately 200 acres of land from agriculture to light and heavy industrial as shown in **Exhibit 2: Proposed Land Use**:

Light Industrial	100 ac
Heavy Industrial	100 ac
<b>Total</b>	<b>200 ac</b>

This conceptual plan is intended to provide a basis for the design of the wastewater system and may not reflect the final development densities. Since development plans for the Industrial Park are not yet available, proposed wastewater flows for buildout of the Industrial Park is based on the proposed land use and an estimated developable area for each parcel. The developable area of each parcel estimates that up to 70 percent of the total parcel area will generate wastewater flows; the remaining 30 percent will consist of areas with no wastewater flows such as roads and parking areas.

**V. WASTEWATER FLOW STANDARDS**

As outlined in the County of Maui's Wastewater Flow Standards and the Design Standards of the Department of Wastewater Management, the following criteria are used in determining the minimum requirements for the wastewater system.

1. **Design Flows**
  - a. For planning purposes, flows are based on estimated occupancy as determined by the standards.

- b. The unit flows for the various land uses are as follows:

Land Use	Unit	Average Flows (Gal/Unit/Day)
Factory	Employee	30
Industrial Shop	Employee	25
Laundry (coin operated)	Machine	300
Office	Employee	20
Storage, w/offices	Employee	15
Storage w/ offices and showers	Employee	30

Store Customer bathroom usage	Use	5
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The following standards were used to compute the minimum number of units required per land use type:

Office Employees	1 per 200 square feet of floor area
Retail Warehouse Employees	1 per 350 square feet of floor area
Storage/Industrial Employees	1 per 500 square feet of floor area

**VI. INDUSTRIAL PARK WASTEWATER FLOWS**

Since site layouts, land uses and unit densities for each parcel are not yet determined, wastewater flows were based on the minimum number of units required by land use type. Since the majority of onsite flows will be generated by employees, the industrial activity with the highest average flow for employees, factory, was used to estimate wastewater flows. Based on the proposed land use, the proposed average flow for full buildout of the Industrial Park is 365,904 gpd (see **Exhibit 3: Wastewater Flow Summation**).

**VII. PROPOSED WASTEWATER SYSTEM**

Since there is no existing wastewater treatment system in the vicinity of the Industrial Park, wastewater flows within the Industrial Park will be treated by onsite IWS systems and decentralized WWTPs. These systems are ideal for areas that are remote and have factors that can make tying into an existing wastewater system difficult or infeasible. Each development within the Industrial Park will be required to provide its own wastewater treatment system and associated wastewater collection system. The type of treatment system used will be determined by the size and type of development. Sizing of each system will be determined during the design phase of each development.

Onsite IWS systems and decentralized WWTPs are regulated by the Department of Health (DOH) under Chapter 62 of Title 11, Hawaii Administrative Rules (HAR). Under Subchapter 3 of the rules, IWS systems can be used as a temporary onsite means of wastewater disposal in lieu of a wastewater treatment works under the following conditions:

1. There is 10,000 square feet of land area for each individual wastewater system;
2. The total wastewater flow of the development does not exceed 15,000 gpd;
3. Area of the lot is not less than 10,000 square feet; and
4. The total wastewater flow into each individual wastewater system will not exceed one thousand gallons per day.

Multiple IWS systems may be used provided that the building is owned by one person. At DOH's discretion, multiple buildings may connect to one IWS system provided that the buildings are located on the same lot and generate wastewater of similar strength and character. IWS are required to consist of a septic tank and soil absorption system, sand filter, subsurface irrigation system or other treatment unit as approved by DOH. Cesspools are prohibited as adequate treatment is not provided.

Where developments do not meet the requirements for an IWS system, decentralized WWTPs are recommended. WWTPs can be sized to accommodate flows from multiple properties located in the same general area. Depending on the development timeline, construction of the WWTP can be phased such that the system can be adapted and expanded to accommodate additional flows at a later date. WWTPs should be located in the lowest region of the service area to allow for gravity flow into the WWTP and avoid the use of pump stations and force mains.

**VIII. COST CONSIDERATIONS**

Since site layouts are not yet available, budgetary costs for development of the Industrial Park could not be determined. General costs for the various improvements are as follows:

Sewer Pipe, PVC	
8-inch sewer pipe	\$200 per linear foot
10-inch sewer pipe	\$250 per linear foot
15-inch sewer pipe	\$325 per linear foot

Treatment Systems

IWS, Septic tank with absorption trenches	\$ 26,500 – 66,000 / 1,000 gallons
WWTP (1,000 to 10,000 gpd)	\$ 31,000 – 88,000 / 1,000 gallons
WWTP	\$ 68,000 - 125,200 / 1,000 gallons

# EXHIBITS

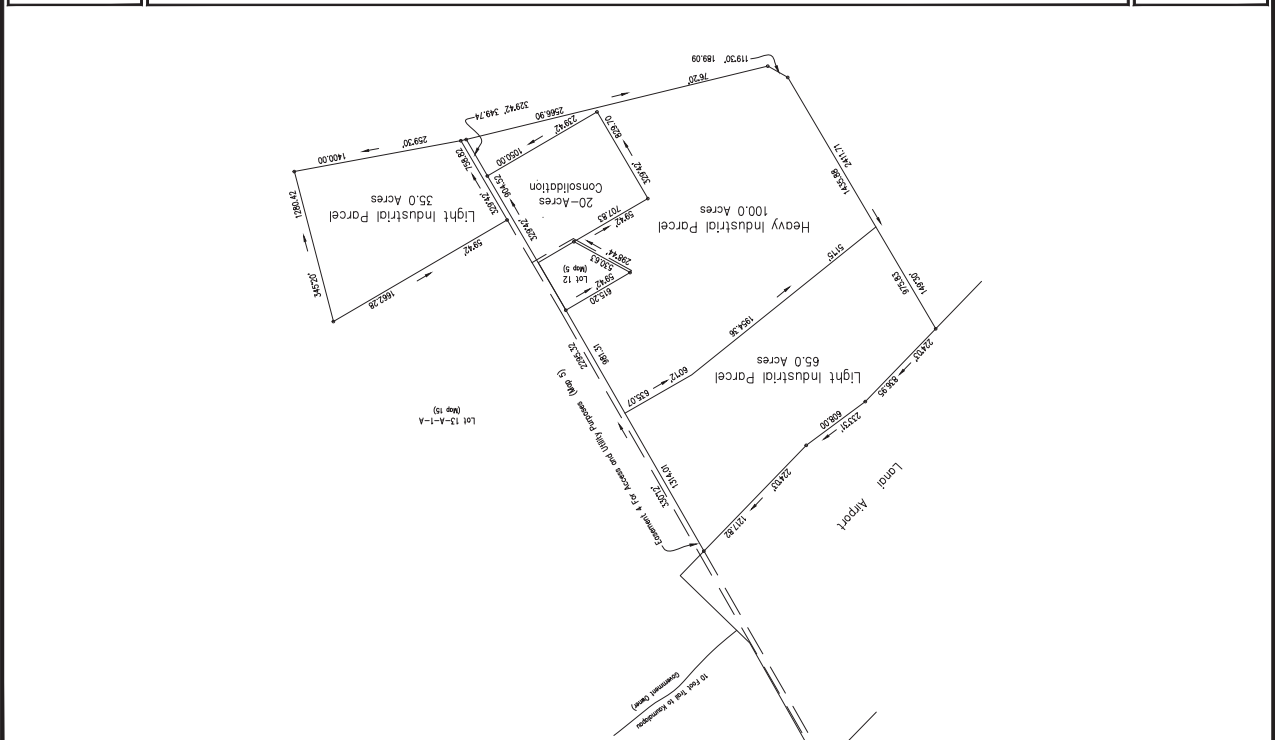
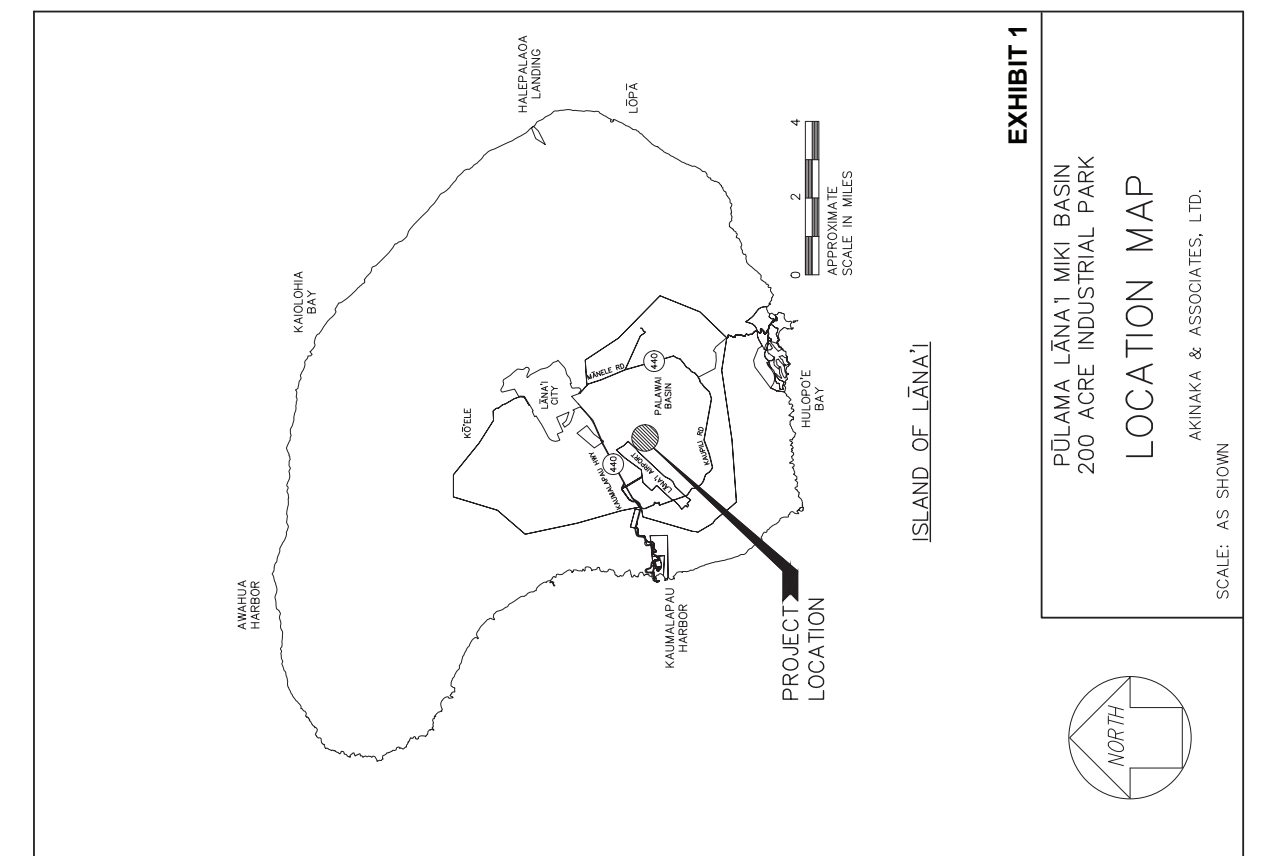
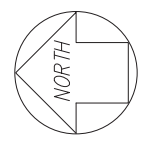


FIG. 0.355FM 1801 PŪLAMA LĀNA'I WATER& WASTEWATER MASTER PLAN\200 PLANNING\270 EXHIBITS\02 200 ACRES\EXHIBIT-PROPOSED LAND USE.DWG



**EXHIBIT 1**  
**PŪLAMA LĀNA'I MIKI BASIN**  
**200 ACRE INDUSTRIAL PARK**  
**LOCATION MAP**  
 AKINAKA & ASSOCIATES, LTD.  
 SCALE: AS SHOWN



0.355FM 1801 PŪLAMA LĀNA'I WATER& WASTEWATER MASTER PLAN\200 PLANNING\270 EXHIBITS\02 200 ACRES\EXHIBIT-LOCATION MAP.DWG

12/12/2018

<sup>1</sup> Based on estimated building development of 70% of total area

EXHIBIT 3: WASTEWATER FLOW SUMMATION PULAMA LĀNA'I MIKI BASIN 200 ACRE INDUSTRIAL PARK									
Point No	Description	Land Use	Area (ac)	Building Area <sup>1</sup> (ac)	Area (sf)	Estimated Required Employees (1 per 500 SF)	Avg Daily Flow Per Capita (gpd)	Avg Daily Flow (GPD)	
A-1/A-2/A-3	Light Industrial	Light Industrial	65	45.5	1,981,980	3,964	30	118,919	
A-4/A-5	Heavy Industrial	Heavy Industrial	100	70	3,049,200	6,098	30	182,952	
B-1	Light Industrial	Light Industrial	35	24.5	1,067,220	2,134	30	64,033	
							Total	365,904	