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WW.PD 03-032

March 14, 2003

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

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI) for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities, Ewa, Hawaii
TMK: 1-9-1-013-007 & 9-1-069-004

The City and County of Honolulu, Department of Design and Construction has reviewed the comments received during the 30-day public comment period, which began on November 23, 2002. The agency has determined that the project will not have significant environmental effects or impacts and has issued a Finding of No Significant Impact (FONSI). Please publish this notice in the April 8th OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, four copies of the Final EA, and the project summary on disk. Please call Dr. Peter Melnyk at (808) 521-4711 if you have any questions.

Very truly yours,

TIMOTHY E. STEINBERGER, P.E.
Acting Director

Enclosures

cc: ENV

FINAL ENVIRONMENTAL ASSESSMENT
FINDING OF NO SIGNIFICANT IMPACT
(FONSI)

2003-04-08-OA-FEA

HONOULIULI WASTEWATER TREATMENT PLANT
NEW SOLIDS HANDLING FACILITIES

EWA, OAHU, HAWAII

TMK: 9-1-013-007 & 9-1-069-004

Proposing Agency:

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF DESIGN AND CONSTRUCTION

This environmental document prepared pursuant to Chapter 343, HRS

Responsible Official: _____ 19 MARCH 2003
Timothy E. Steinberger / Date
Acting Director

GMP HAWAII, INC
1100 Alakea Ave, Suite 1800
Honolulu, Hawaii 96813

APRIL 2003

PROJECT SUMMARY

Project Name:	Honouliuli Wastewater Treatment Plant New Solids Handling Facility
Applicant:	City and County of Honolulu Department of Design and Construction 650 South King Street Honolulu, Hawaii 96813
Agent:	GMP Hawaii, Inc. 1100 Alakea Street Suite 1800 Honolulu, Hawaii 96813 *Contact: Dr. Peter Melnyk, Senior Engineer* Phone: (808) 521-4711 Fax: (808) 538-3269
Property Owner:	City and County of Honolulu
Approving Agency:	City and County of Honolulu (Same as Applicant)
Tax Map Key:	9-1-013-007 & 9-1-069-004
Location:	91-1000 Geiger Road Ewa, Oahu, Hawaii
Property Acreage:	51.34 Acres
State Land Use District:	Urban
Existing County Zoning:	R-5 Residential
Development Plan Land Use Designation:	Ewa Development Plan, Public Facility
Special Designation:	None
Anticipated Determination:	Finding of No Significant Impact (FONSI)

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EXECUTIVE SUMMARY

INTRODUCTION

The Honouliuli WWTP has successfully used heat treatment for sludge stabilization since the facility went into service in 1984. Currently, the plant treats an average daily wastewater flow of 26.8 million gallons per day (mgd). The plant's future loading is estimated to be 42.0 mgd. The plant must expand the capacity of the sludge stabilization system unit operation to satisfy the increased demand through year 2020. The plant has the option to expand heat treatment or consider another stabilization technology.

ALTERNATIVE ANALYSIS

The *Draft* Environmental Assessment for Honouliuli WWTP New Solids Handling Facility reviews several alternatives for final sludge disposal. The Alternative Analysis includes: 1) Heat Treatment and Incineration; 2) Land Disposal; 3) Beneficial Use Through Anaerobic Digestion; 4) Composting Primary Sludge; and 5) No Action Alternative. The preferred alternative is Beneficial Use Through Anaerobic Digestion. The City and County of Honolulu has determined sludge treatment utilizing anaerobic digestion for sludge stabilization and a combination of beneficial use for dewatered sludge has become the preferred alternative. This decision has been attributed to the fact that after nearly twenty years of service the existing heat treatment system is near the end of its useful life, incineration practices have become more difficult to permit, high operations and maintenance costs, and options for disposal have changed significantly.

The City and County has the task of choosing the type of equipment employed for the anaerobic digestion. Currently, two possible types of equipment are available: conventional digesters and egg shaped digesters (ESD). The *Draft* Environmental Assessment describes both types of digester equipment, their operational costs and lifecycle costs, odor control mechanisms, and anticipated project impacts

In addition, digester gas, a by-product of anaerobic digestion, may be used as a resource (co-generation), which is anticipated to increase in importance in the future. The planned facility will include equipment to maximize the benefit of full utilization and recovery of heat and power from the digester gas which will support a portion of Honouliuli WWTP's power requirements.

EXISITING ENVIRONMENT

The *Draft* Environmental Assessment describes the operations of Honouliuli WWTP and its existing environment and surrounding areas. The criteria used to describe existing environment includes location, climate, existing land use and zoning, topography and geology, drainage, archaeological and historic resources, flora and fauna, utilities, socio-economic, air quality and noise quality.

PROJECT IMPACTS AND MITIGATION MEASURES

Project impacts are assessed for both short-term impacts caused by construction activities and long term impacts associated with the operation of the anaerobic digesters. The short

and long term impacts of either the conventional digester vs the ESD are anticipated to be the same unless otherwise indicated.

Short term impacts include increase in noise levels due to construction equipment and can be mitigated through maintenance of equipment and maintaining work schedule during daylight hours. Construction activities may also impact air quality, which may be mitigated through the Contractor's dust control plan, ie: using dust control methods such as dust screens and watering and suppression equipment. Long term impacts to noise levels are not anticipated due to each digester design (fully encased) and other equipment (ie: generator) are housed within concrete buildings. Impacts to air quality are not anticipated because of the strict regulations concerning air pollution control and the implementation and continued compliance with the current covered source permit. Any modifications that may involve the facility's air emission systems will be addressed in the modified covered source permit. The combination of the anaerobic digestion process, which is relatively odor free, and the design of several odor control upgrades will maintain air quality at the WWTP.

All proposed actions will be maintained with the existing footprint of Honouliuli WWTP and no land will be acquired to install the anaerobic digesters and support facilities. There are no known threatened, rare, or endangered species of flora and fauna inhabiting the project site. No known archaeological or historical features have been discovered on the property in past uses and it is not anticipated that the construction facilities will unearth significant historical features. However, the Contractor will be trained to recognize any features that may require further investigation by the State Historic Preservation Division.

Construction waste shall require the appropriate waste management plans receive approval from the Department of Environmental Services before removal from the project site to an approved disposal site. Public health and safety are not anticipated to be compromised because of the strict regulations and protocol of the Standard Occupational Safety and Health Administration (OSHA) applied at the WWTP.

Currently, a NPDES permit allocates the disposal of primary and secondary effluent from the WWTP to the Barbers Point Ocean Outfall. The proposed anaerobic digestion is expected to improve the BOD (biological oxygen demand) level in the effluent that is being discharged. This positive impact results from the reduction in flow and BOD concentration in the centrate that is recycled to the head of the plant. While this stream will contain higher concentration of suspended solids, the primary treatment process can efficiently remove this material.

Impacts to the socio-economic environment are positive due to the creation of jobs during the construction phase. Without the ability to accommodate the growth expected in leeward O'ahu, negative economic and social impacts would be anticipated due to the inability to handle the additional loadings at Honouliuli WWTP. The proposed facilities are in concert with planned development and existing land use.

Visual impacts for the ESD are anticipated as being negative due to their height of 92 ft. Mitigation measures for minimizing the visual impact may include landscaping with large palm or pine trees.

FINAL DECISION

A final decision for the EA, which type of digester to employ and the Finding of No Significant Impact may be determined once the public review of the *Draft* EA and consultation process has been concluded.

SECTION 1
INTRODUCTION

SECTION ONE

INTRODUCTION

1.1 PROJECT BACKGROUND

The Honouliuli Wastewater Treatment Plant (WWTP) is the City and County of Honolulu's second largest wastewater treatment facility and serves one of the fastest growing areas in the State of Hawaii. Honouliuli WWTP was placed into service in 1984 and has undergone numerous expansions due to growth generated within the service area.

The Honouliuli WWTP has successfully used heat treatment for sludge stabilization since the facility went into service in 1984. Currently, the plant treats an average daily wastewater flow of 26.8 million gallons per day (mgd). The plant's future loading is estimated to be 42.0 mgd. The plant must expand the capacity of the sludge stabilization system unit operation to satisfy the increased demand through year 2020. The plant has the option to expand heat treatment or consider another stabilization technology.

A 1995 study, *Solids Handling for the Honouliuli Wastewater Treatment Plant,* was prepared for the City's Department of Wastewater Management evaluating stabilization processes. The study considered three disposal options: 1) incineration; 2) land disposal; 3) beneficial use. These alternatives are reviewed further in this Environmental Assessment (EA), Section Two, *Alternative Anaylsis.*

In summary, incineration has become an undesirable option and anaerobic digestion a favorable alternative for stabilization due to its low energy consumption, benign environmental impacts and ability to facilitate beneficial use options.

Another study has been performed in November 2001, *Honouliuli Solids Stabilization Study,* that further explored sludge stabilization and recommended the utilization of the High-Rate Anaerobic sludge process. The findings of this 2001 Stabilization Study concluded that the design of the WWTP to meet anticipated growth should proceed on the basis of conventional anaerobic digestors with the investigation into cost and impacts of the egg shaped digesters (ESD). The most current study, *Honouliuli Wastewater Treatment Plant New Solids Handling Facilities* (November 2002), evaluates both anaerobic digestion systems and the existing facilities.

1.2 ENVIRONMENTAL ASSESSMENT

The proposed action of anaerobic digestion for Honouliuli WWTP will require the use of State or County land and/or funds, which triggers Chapter 343 under the State of Hawaii's Environmental Review Law. HRS 343 requires the preparation of an *environmental assessment* (EA) and/or *environmental impact statement* (EIS), which gives systematic consideration to the environmental, social and economic consequences of the proposed actions before permits are granted and construction, begins. The law also ensures the public the right to participate in

planning projects that may affect the community. The Office of Environmental Quality is responsible for insuring compliance with this law in the State of Hawaii.

Within this *Final* Environmental Assessment (EA), Section Two, *Alternative Analysis,* will discuss the alternatives of incineration, land filling, composting, and two alternative technologies of anaerobic digestion for future demands on sludge handling. Section Three, *Existing Environment*, describes the existing environment at the project site. Section Four, *Project Impacts and Mitigative Measures*, will assess the short-term and long-term impacts anticipated with the preferred alternative of the anaerobic digestion system. Section Five through Section Ten offer a summary of conclusions, lists necessary permits and approvals, and identifies agencies consulted in the preparation of this *Final* EA document. The *Final* EA incorporates the final decisions made based upon this assessment and includes the review comments received by the consultation process.

1.2.1 Purpose

The purpose of the project is to expand the capacity of sludge stabilization system unit operation to satisfy the growth expectations for leeward O'ahu through the year 2020.

1.2.2 Project Need

The project need is based on the fact that current plant loading is near its capacity and the existing equipment is over 20 years old with replacement extremely difficult if not impossible. In addition, incineration for sludge disposal is an undesirable option for future planning due to the tighter US Environmental Protection Agency air pollution regulations.

1.2.3 Proposed action

The City and County of Honolulu has determined to change the sludge treatment process utilizing anaerobic digestion for sludge stabilization and a combination of beneficial use and landfill for the dewatered sludge disposal.

1.3 PROJECT REQUIREMENTS

Final determination of the project requirements will be dependent on the type of anaerobic digesters chosen (i.e.: conventional versus the egg shape design). The implementation of the anaerobic digestion system to the Honouliuli WWTP is within the scope of this environmental review process. Expansion of existing facilities is excluded from any further assessment under this document because they are activities that are currently being performed within the facility. However, a description of the required upgrades and expansion of existing facilities is provided for clarification of the processes at the Honouliuli WWTP.

1.3.1 Expansion of Existing Facilities

The expansion of existing facilities that will be required due to the 2020's anticipated increase has been assessed in the November 2002 Engineering Report, *Honouliuli WWTP New Solids Handling Facilities*. The anticipated increase in plant flow will require that several components of the existing solids handling facilities be expanded. The ability of the existing gravity thickener tanks, blend tanks, and dewatering centrifuges and their appurtenance equipment to handle increased plant flow will be described in this section.

Gravity Thickeners

There are two (2) existing gravity thickeners (GTs) at the Honouliuli plant. The GTs are 40' diameter tanks with a side depth of 10'-0'. The thickener drives were originally installed when the plant was initially constructed almost twenty years old ago. The gravity-thickened sludge (GTS) from the GTs is pumped to the blend tanks.

Only one (1) GT is required to operate at the current flow, but at least two (2) will be required to handle the projected 2020 design flows of 42 MGD. For ultimate capacity of the 51 MGD, three (3) GTs will be required for operation.

In summary, one (1) additional GT will be required for the plant to operate the two (2) existing GTs because one GT is needed for backup. For ultimate capacity, two additional GTs will be needed to total four (4) with three required for operation and one for back up purposes.

There is adequate space on the property and no additional land acquisition would be required. Space is available adjacent to the south of the existing GT tanks for the construction of two (2) additional GT tanks and a new pump room required for their maintenance.

An alternative to construction of new GT is the conversion of the plant's existing decant tanks (DTs) to GTs has been proposed. The existing DTs will no longer be needed after the heat treatment system is taken out of service and replaced with the proposed anaerobic digestion system. The existing DTs are very similar to the GT tanks with two major differences, the side water depth and bottom slope. Conversion of the DT to meet GT standards can be met with minimal construction.

The thickener drive units and scraper mechanisms of the existing GTs should be replaced and will also be replaced on the converted DT's.

Blend Tanks

The existing blend tanks will be utiiized to blend the GTS and thickened waste activated sludge (TWAS), which is generated by the trickling filter solids contact wet steam process, prior to being pumped to the digesters. The concrete structures of the blend tanks have shown signs of deterioration due to exposure to hydrogen sulfide gases and off gases from the heat-treated sludge. The blend tank structures are being repaired under the Interim Modification Project.

The existing mixers at the blend tanks need to be assessed to determine their suitability for continued operation and shall be either refurbished or replaced as necessary.

Centrifuges

Honouliuli WWTP has three (3) sludge dewatering centrifuges. The centrifuges dewater thickened heat-treated sludge (THTS) from the decant tanks or from the blend tanks numbers 3 or 4. At the expected 2020-year flow, the average flow of digested sludge out of the digesters is expected to be 150 gpm with 2 to 2.5% solids. The existing centrifuges operate between 40 to 50 gpm with heat-treated sludge.

It is proposed that three (3) existing centrifuges be replaced with three (3) new centrifuges. Each centrifuge would be sized for a feed rate of 200 gpm. Under normal operating conditions, one centrifuge would be required to operate 16 hours per day. Ideally, with three (3) new centrifuges capable of 200 gpm, two (2) centrifuges would provide service with each operating at 8 hours per day (one shift), and the third centrifuge could be on hand for a standby unit so that continuous ability to dewater sludge is assured.

Appurtenant Equipment

Each GT has two progressing cavity pumps; each rated for up to 164 gpm. All pumps are in good condition and adequate size and may remain in service. However, replacement of the mechanical variable speed drives to a more dependable variable frequency drives (VFDs) is recommended. In addition, the DTs also have two progressing cavity pumps rated for up to 51 gpm and will have to be upgraded if DTs are converted to GTs as to accommodate the flow rates of up to 164 gpm. Replacement of the existing mechanical variable speed drives to VFDs is also recommended.

Dewatered sludge is transported from the centrifuge discharge chutes to trucks by screw conveyors. The existing screw conveyors (at a minimum) will need to be relocated when the new centrifuges are installed. It is recommended that the screw conveyors be replaced with new shaftless screw conveyors.

Polymer addition is a key component to successfully dewatering anaerobically digested sludge. The existing polymer system will be replaced with a new packaged polymer mixing and feeding system.

There is an existing scum concentrator located on the ground floor of the dewatering building. The scum concentrator is a major source of odors within the building. It is recommended that the scum concentrator be removed and that the scum from primary clarifiers be pumped to the blend tanks for mixing with the GTS and TWAS before being pumped to the digesters.

1.3.2 Modifications to Existing Facilities

Ventilation Modifications at Dewatering Building

It is planned that the dewatering building be provided with an upgraded mechanical ventilation system that will serve both the ground floor and second levels. Ventilation air from the building, the centrifuges and dewatered sludge screw conveyors will be treated with a multi-stage wet scrubber to destroy odors before being discharged.

Odor Control Equipment

The odor control system being considered for this project is a packaged two-stage wet scrubber. The system uses liquid adsorption to remove primarily ammonia and hydrogen sulfide (H_2S). In the first stage, ammonia is absorbed in an acid solution through contact in a packed tower. In the second stage, H_2S, mercaptans, dimethly sulfides and disulfides are absorbed in a base solution through contact in one or more packed towers. The base solution contains and oxidizer, sodium hypochlorite, to oxidize the sulfide compounds to sulfates. The dissolved salts (i.e., sodium and ammonia sulfates) generated in the scrubber solution are recycled to the plant headworks. The system's manufacturers claim minimum removal of 99% for each primary containment.

The system has three independent counter-current stages, each equipped with an independent sump and re-circulation pumps. The caustic scrubbing and ammonia solutions will be used in the first two stages to remove the majority of the hydrogen sulfide in the foul air. In addition, an acid and bleach solution will be used to remove the remaining hydrogen sulfides and any mercaptans, dimethyl sulfides and disulfides in the foul air stream. The removal efficiencies are expected to be 99+%.

1.4 LAND REQUIREMENTS

All proposed upgrades of existing facilities and the preferred alternative of either the conventional digesters or the egg shaped digesters will be located within the current property's footprint. No acquisition of adjacent land will be required.

1.5 UTILITY REQUIREMENTS

Utility requirements for the operation and maintenance of the proposed conventional digesters versus the ESD are based upon energy consumption, staffing and maintenance. The process for the sludge digestion for conventional digesters versus ESD does not have a significant difference in the power requirements.

The existing monthly power consumption from HECO (Hawaiian Electric Company Inc.) is 1,008,000 KWH (per month based on 2001). The replacement of the existing heat treatment

process with anaerobic digestion provides a double benefit in energy savings. First, the latter process is less energy intensive. Power demand is reduced to 57% of the existing process. Second, anaerobic digestion together with co-generation is a net energy producer. The combustion of biogas can produce 945kw of electricity. Five hundred (500) kw will be consumed by the solids stream for the gravity thickening operation to sludge dewatering. The remaining 445kw can be used to power the major load center operating the secondary treatment process.

Currently, Honouliuli WWTP uses 113,000 gallons per day (GPD) of potable water from the Board of Water Supply. The WWTP uses 2 million GPD of reclaimed water from the reclamation facility located adjacent to the WWTP. The proposed facility is will not increase the water supply demand at the facility.

1.6 PRELIMINARY CONSTRUCTION COST OF PROJECT

Preliminary constructions cost estimates have been prepared for each type of digester equipment. The anticipated construction cost for the conventional digesters is $27.9 million. The estimated construction cost for the egg shape digesters is $31.2 million.

1.7 TENTATIVE DEVELOPMENT SCHEDULE

The project schedule is dependant on the appropriation of funds, approval of the final EA, final decision for digester type, and obtaining necessary government permits and approvals. The City and County of Honolulu anticipate finalizing the design and permitting to be conclusive at the end of 2003 with construction beginning in early 2004.

1.8 AGENCY APPLICANT AND APPROVING AGENCY

A final EA must be approved by the government agency with permitting power over the project. For agency action of the EA, the proposing and approving agency is one and the same. (OEQC *Guidebook* 1997). The applicant and approving agency is City and County of Honolulu Department of Design and Construction.

SECTION 2
ALTERNATIVE ANALYSIS

SECTION TWO

ALTERNATIVE ANALYSIS

The best alternative for final disposal of dewatered sludge will determine the process by which sludge is stabilized. Currently, sludge is heat treated at Honouliuli WWTP. The disposal methods under review include incineration, land filling, composting and beneficial use. Sludge stabilization is necessary for all disposal methods and the objectives of the stabilization process are: 1) volume reduction; 2) produce a material that is easily dewatered; 3) produce a material that will not attract vectors; and, 4) reduce concentration of pathogens.

According to the Environmental Protection Agency (EPA) Part 503 Rule 109, Class A and B biosolids are classified on the levels of pathogens present in the biosolids that are used or disposed. If pathogens are below detectable levels, the biosolids meet the Class A designation. Biosolids are designated Class B if pathogens are detectable but have been reduced to levels that do not pose a threat to public health and the environment and as long as actions are taken to prevent exposure to the biosolids after their use or disposal.

Heat treatment or composting produce Class A biosolids. Since the product is pathogen free is can be distributed in the market place. Conversely Class B biosolids produced through anaerobic digestion, must be disposed in controlled conditions that prevent exposure to the public and the environment.

Solids reduction and dewaterability of the stabilized sludge are important in keeping treatment costs low. Solids reduction reduces the quantity of material that must be dewatered and ultimately disposed of. Production of a material that can easily be dewatered to an acceptable solids concentration reduces processing efforts and the volume of material that requires disposal. Stabilization must also result on a sludge that will not attract vectors when either landfillling, or beneficial use.

An alternatives analysis that considers both final disposal and sludge stabilization include the options: 1) Heat treatment and incineration; 2) Landfill disposal; 3) Beneficial use through anaerobic digestion; 4) Composting Primary Sludge; and, 5) No action.

The analysis will conclude that beneficial use through anaerobic digestion is the preferred alternative. There are also two additional considerations to be made in selecting the process of anaerobic stabilization: equipment type (conventional digesters versus egg shape digesters) and odor controls for each type of equipment.

Section 2.3.1 and Section 2.3.2 further describe the two types of digesters, convectional and egg shaped, and the type of odor controls applicable to each design. The two types of digesters will be further assessed for their environmental impacts and mitigation measures under each criteria outlined in Section 4, *Project Impacts and Mitigation Measures.*

2.1 HEAT TREATMENT AND INCINERATION

The Honouliuli WWTP had successfully used heat treatment for sludge stabilization since start-up in 1984. Heat treatment was an attractive option for stabilization in the late nineteen seventies and eighties. Heat-treated sludge is easily dewatered and produces a very dry cake without the need of polymers, and when incinerated the material burns without the need for supplemental fuel (GMP Inc., Final Report 1982)

Currently, the incinerator at the Honouliuli WWTP has been idle for several years and the dewatered sludge has been sent to the landfills, Kapaa Landfill (currently closed) and Waimanalo Gulch Landfill, for disposal. A Draft Environmental Assessment (1993) was conducted for a proposed sludge a new sludge incinerator that would improve plant capacity at the Honouliuli WWTP. The environmental review recommended that an Environmental Impact Statement (EIS) be performed due to several environmental concerns. The 1993 EA cited the following concerns:

- A need to further develop air quality models to assist in predicting the impacts created by stack emissions;
- Define the potential future market for sludge based products; and,
- Investigate the type of available incinerators available with reference to economic stability of the manufacturers and their ability to provide long-term maintenance.

Another Draft Environmental Assessment was performed in 1997 that proposed an incinerator upgrade, a fluidized bed that would have minimal impacts due to economical and operational advantages. Since these environmental reviews have been performed, City and County of Honolulu has elected not to continue with incineration as a disposal option.

The process of incinerating anaerobically stabilized sludge would not be endogenous (i.e., self sustaining) and therefore require supplemental fuel to incinerate. Also, the incinerator requires electrical power to operate various components, such as the combustion fans, air compressor, pumps, scrubbers, ash conditioner etc. None of these electrical loads are required at the WWTP if the sludge is processed of-site.

In conclusion, incineration of primary or digested sludge has become an undesirable option based on its high-energy consumption which requires supplemental fuel, economic feasibility, and shifts in public perception due to the health risks associated with air emissions.

2.2 LAND DISPOSAL

Operation of the municipal landfill is regulated by the Subtitle D program promulgated under the Resource Conservation and Recovery Act (RCRA). These regulations prohibit landfilling sewage sludge that does not pass the "Paint Filter Liquids Test". This test qualifies the amount of free liquid present within the material. The City and County of

Honolulu use this test to qualify all sewage sludge before disposal to the municipal landfill.

The Waimanalo Gulch Landfill is the only operating sanitary landfill on Oahu at this time. As this landfill is near capacity the City and County of Honolulu is in the process to extend its life span via vertical expansion and increasing its footprint by (May 2002). However, the expansion has not been confirmed, therefore, consideration should be given to its current capacity. Currently the City and County have been granted an expansion of 30 vertical feet (Department of Health September 2002).

Due to the constant concern over the limited availability of landfill space, and the extreme difficulty and expense of siting new landfill space on Oahu, the City and County of Honolulu continues to support the beneficial use of biosolids. Directed by Consent Decree 309 promulgated by the US Environmental Protection Agency (EPA) and the State of Hawaii Department of Health, the City and County of Honolulu is required to reuse 10 dry tons of municipal sludge per day. This consent decree began in December 1995 and is scheduled to end by December 31, 2005. Presently the WWTP is generating 10 dry tons per day of dewatered sludge, and this sludge is delivered to the United States' Navy Composting Operation, located at the Kalaeloa Community Development District (formerly Barber's Point Air Station). This contract with the Navy is an open-ended agreement, which can be terminated by either party with a 30-day notice.

Landfilling dewatered sludge is not a preferred alternative because the City and County is currently supporting the opportunities to reduce additional loading on the landfill.

2.3 BENEFICIAL USE THROUGH ANAEROBIC DIGESTION

Beneficial use of sludge, termed "biosolids", includes a variety of technologies that can use dewatered sludge and convert to a quality pasteurized product suitable as a soil conditioner or amendment. Currently, Honouliuli WWTP sends approximately 380 cubic yards per week of dewatered sludge to the composting facility operated by the US Navy where it is combined with greenwaste and composted for use. In addition, the options to send Honouliuli dewatered sludge to the proposed sludge dryer at Sand Island WWTP are being considered for the near future. The need for some or all of Honouliuli's biosolids in the future may be considered a substantial investment.

As mentioned above, the incinerator at Honouliuli WWTP has not been in use for several years. Without the use of incineration, the atypically dry and autogenous cake produced from the currently heat-treated sludge is no longer an advantage. The heat treatment process becomes a significant energy consumer since waste heat from the incinerator is used to generate steam for the heat treat process, fuel oil is needed to heat treat without the incinerator.

Therefore, when incineration is not considered as a viable alternative to meet future needs, anaerobic digestion becomes a better choice for stabilization due to its low energy consumption and ability to support beneficial use technologies.

Anaerobic digestion is one of the old and most commonly used unit operations of wastewater treatment. It is a biological process that involves the decomposition of organic material in the absence of oxygen. In a digester, a consortium of organisms work together to bring about the conversion of organic waste material to a variety of simpler end products that include: methane, carbon dioxide, and water. The conversion is thought to occur in three distinct steps: 1) hydrolysis; 2) Acetogenesis (acid formation); and, 3) methane formation; and, best accomplished at a temperature of around 95°F.

There are also two additional considerations to be made in selecting the process of anaerobic stabilization: equipment type and odor control. The 2001 *Solids Stabilization Study* recommended that the design for a high-rate mesophilic anaerobic sludge process review the design and feasibility of two types of anaerobic digestion equipment: 1) conventional anaerobic digesters; and, 2) egg shaped digesters. These two types are described below in Section 2.3.1 and 2.3.2.

Although anaerobic digestion does not generate the offensive and pervasive odors that result from the current heat treatment process, odor control is a necessary design factor. Anaerobic digestion does generate hydrogen sulfide and other malodorous sulfide compounds, and these must be controlled due to the probability that urban development will occur within the vicinity of the Honouliuli WWTP.

Two separate odor control modifications for Gravity Thickeners (GTs) and Blend Tanks (BT) have been proposed along with the introduction of anaerobic digestion process. One odor control scrubber will be located near the dewatering building and handle the ventilation air from sludge dewatering areas, the centrifuges, and the sludge screw conveyors. The other odor control scrubber will be located near the existing gravity thickeners to destroy odors from the sludge thickening and blending operations. Odor control mechanisms, such as covers, are described for each type of digester in Section 2.3.1 and 2.3.2.

Another benefit of anaerobic digestion is the opportunity for co-generation by the combustion of biogas. Biogas with one half the fuel value of natural gas can fuel an internal combustion engine. This engine drives a generator (mechanical energy) while heat from the cooling system and engine exhaust can be used to maintain the digester temperature at 95°F and operate an adsorption chiller to air condition administration and maintenance. Co-generation provides a secondary benefit in reducing the plant SO_2 emissions.

The conventional digester is equipped with a floating cover that stores gas with a water seal to prevent emissions. Gas generated by the ESD is sent to a gas holder located next to it. Both types of equipment use the biogas in the same means to generate energy (co-generation).

2.3.1 Conventional Digesters

The large majority of digesters operating in North America have been designed as regular cylindrical vessels with a diameter to height ratio of approximately 2.5. According to the basis of design for Honouliuli WWTP New Solids Handling Facilities, three digesters each measuring 90 feet (ft) in diameter and 35 ft total wall height and 12 ft. deep cone bottom are proposed. Each digester will be equipped with a steel floating gas holding cover. The cover will float in an outboard channel. The design of the conventional digester gas holding cover will use a water seal to prevent any gases from escaping to the atmosphere.

The conventional digester is constructed with reinforced concrete walls and floor. Coal tar epoxy or copolymer is applied to those surfaces exposed to moist biogass such as the interior upper walls, underside of the cover, and pretreated gas piping. Figure 2-1 illustrates the layout and design of each digesters tank and cover.

Each digester will also be equipped with four (4) externally mounted draft tube mixers with reversible impellers. Two of the externally mounted mixers are equipped with a hot water jacket to heat incoming sludge. Progressive cavity pumps with grinders installed on the suction side will pump thickened primary and secondary sludge from the existing blend tank to the digesters.

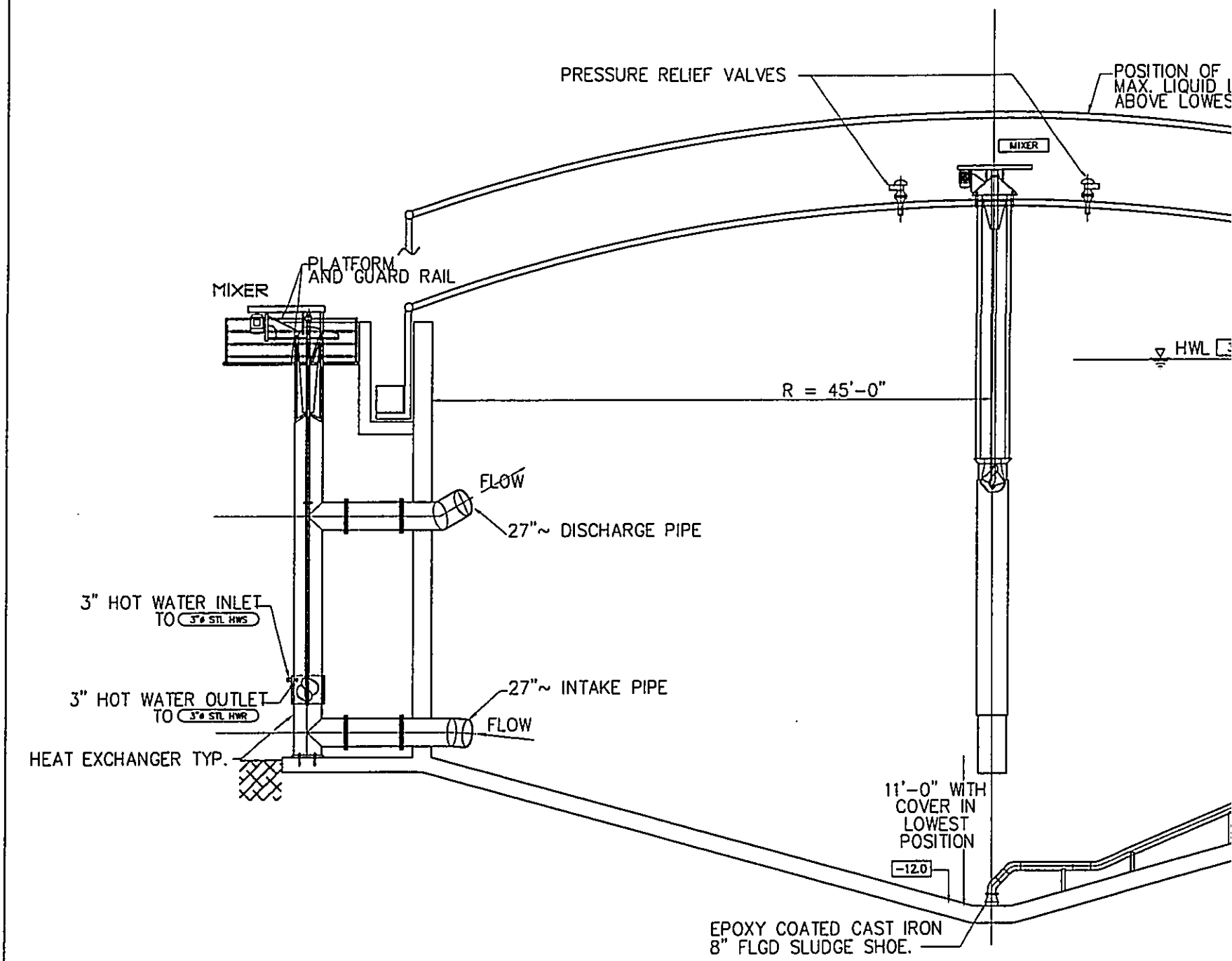
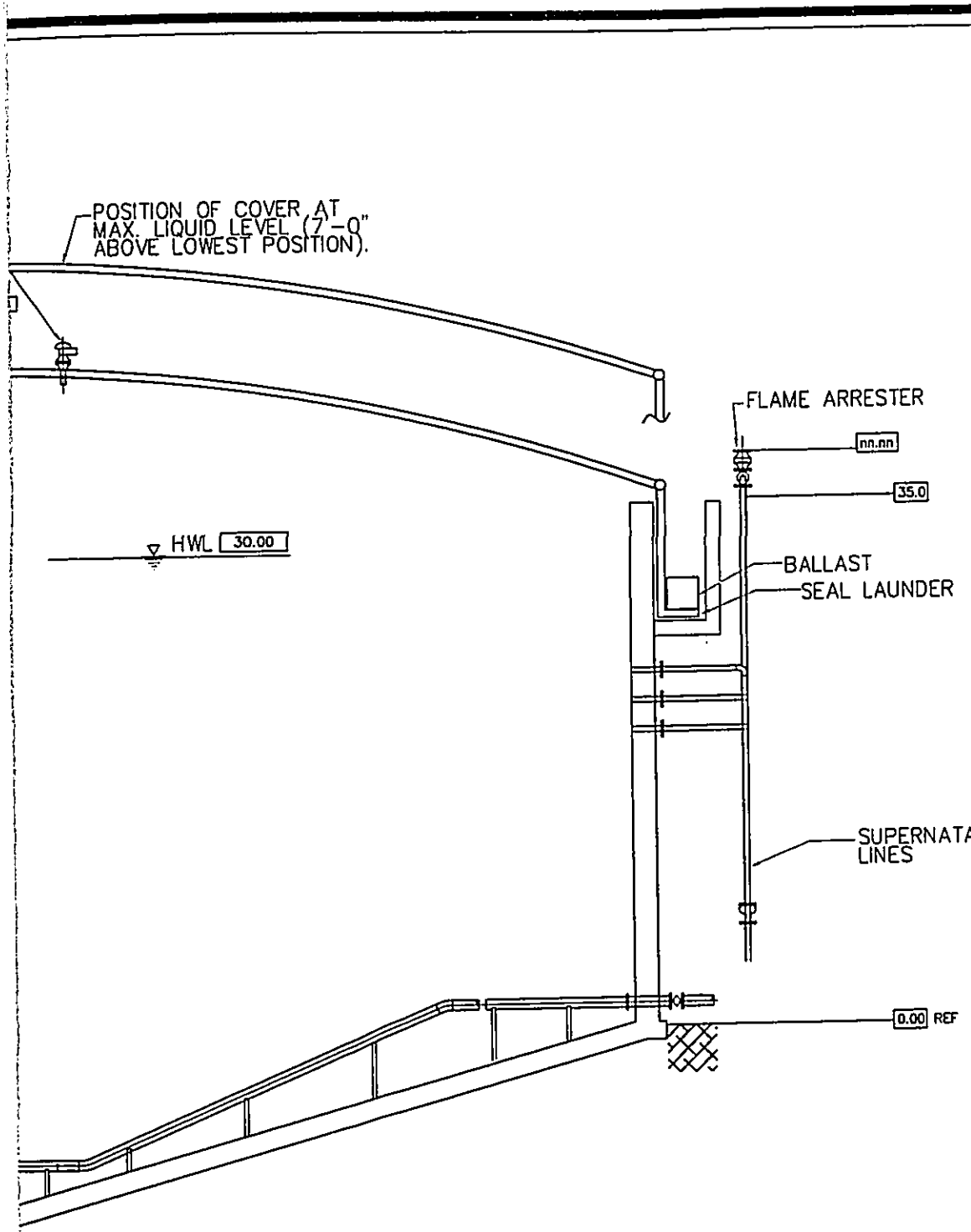


Figure 2-1 TYPICAL DIGESTER DESIGN

SCH5138D



GESTER DESIGN

Flow from any of the three digesters can be transferred to one another using transfer pumps, each with a grinder mounted on its suction. Sludge heating within the digesters is accomplished by passing through the mixers with hot water jackets.

Digested sludge would be pumped from the third digester to any of the three centrifuges progressive cavity pumps each with a grinder mounted on its suction.

Three new decanter type centrifuges are proposed to replace the existing smaller centrifuges. Each centrifuge is sized at 200 gpm. Dewatered sludge is transferred for disposal by means of two new conveyors to replace the aging existing ones.

Figure 2-2 illustrates the process flow schematic for the conventional digesters. Figure 2-3 illustrates the total plant flow schematic and Figure 2-4 illustrates the site plan.

2.3.2 Egg Shape Digesters

European practice has been to use Egg Shaped Digesters (ESD) with a diameter to height ratio of about 1.5. The only supplier of ESD in North America is CBI Walker. The proposal provided by CBI includes two digesters each measuring 92.38 ft high and a major diameter of 74.00 ft. The proposal also includes a sludge storage tank measuring 96.00 ft high with a diameter of 35.00 ft. A gas holding tank measuring 58 ft in diameter with a vertical height of 48 ft is required. The gas holding tank will have a capacity of 75,000 cubic feet sufficient for the requirements of the cogeneration facility.

The ESD is a steel fabricated structure with coal tar epoxy on interior surfaces exposed to biogas. Exterior surfaces are insulated with 2" of urethane foam. Surfaces above the ring wall are finished with an elastomer and below with a fire protective coating. The size and insulation of the ESD results in lower heat losses compared to the conventional digester.

Sludge will be introduced to the ESD as the described for conventional digesters. The ESD proposal includes mixing and transferring sludge between the two digesters and the sludge holding tank and the transfer of gas from the digesters to the gas holding tank. All process piping and pumps will be house in service gallery located underneath the two egg digesters and is part of the supply and install proposal. Figure 2-5 illustrates a typical ESD with a mixer.

Figure 2-6 illustrates the process flow schematic for the egg shaped digesters. Figure 2-7 illustrates the overall plant flow schematic and Figure 2-8 illustrates the site plan for the ESD design.

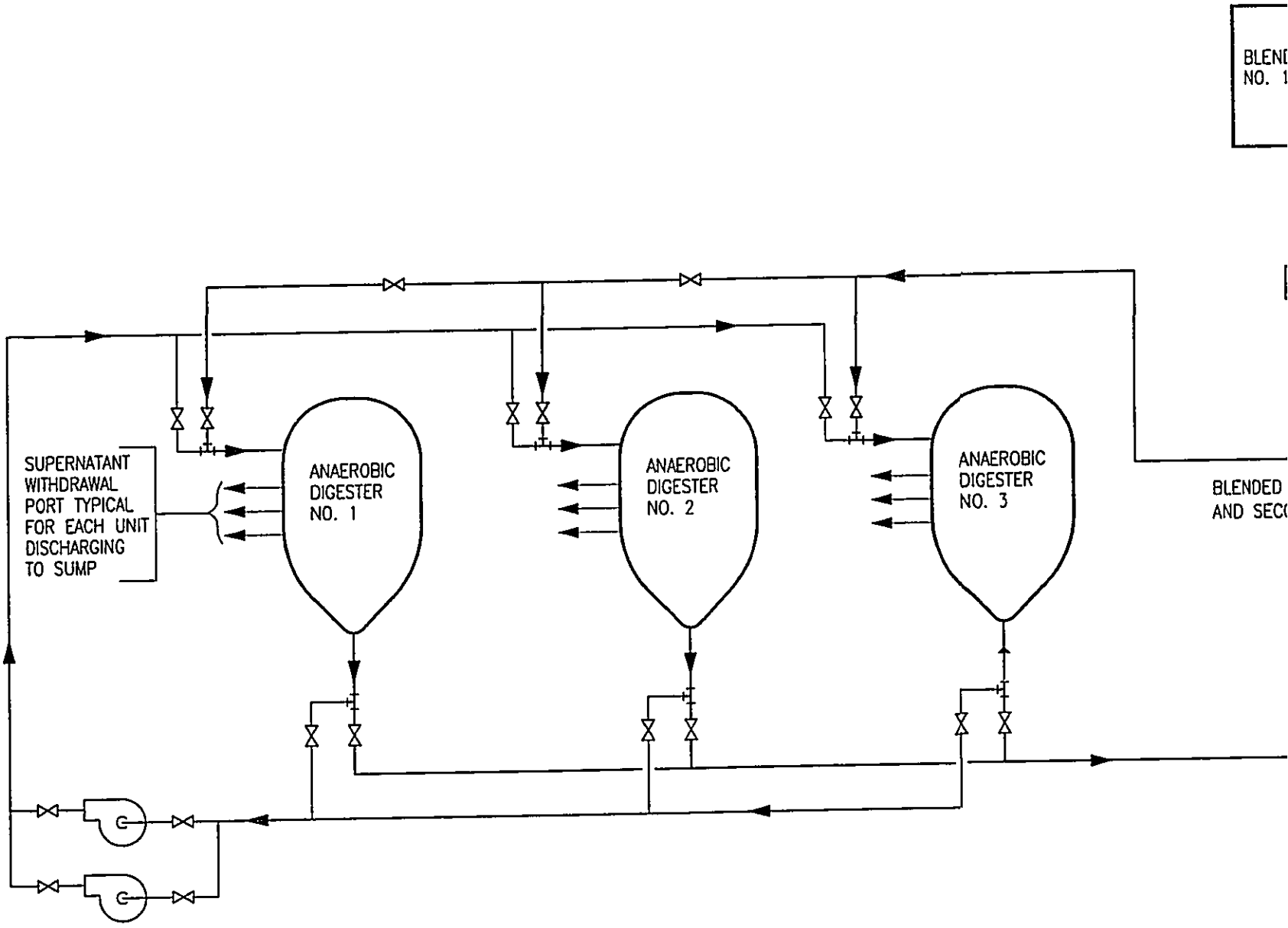
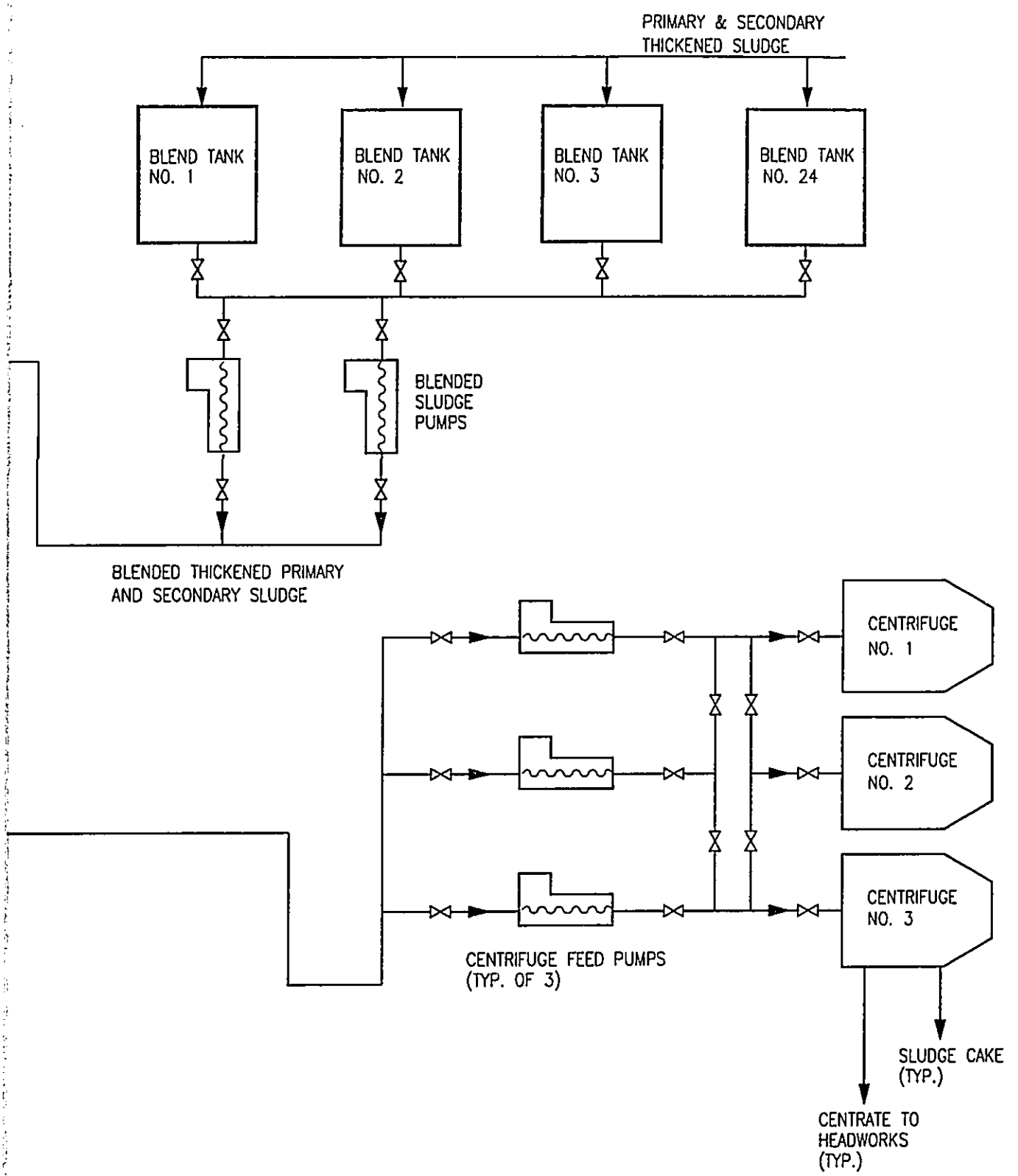


Figure 2-2 PROCESS SCHEMATIC FOR CONVENTIONAL D

SCH5138E



CONVENTIONAL DIGESTER OPTION

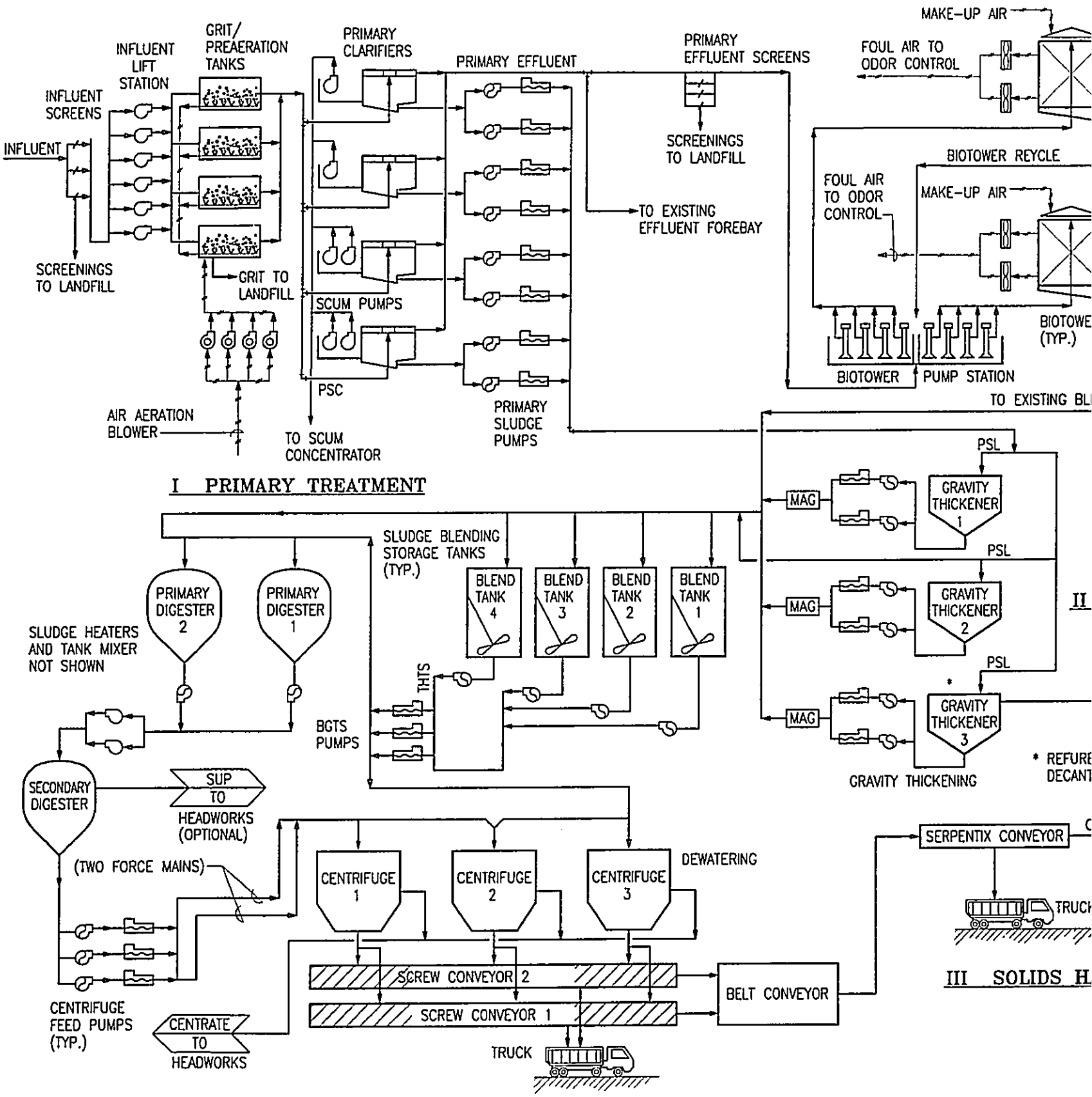
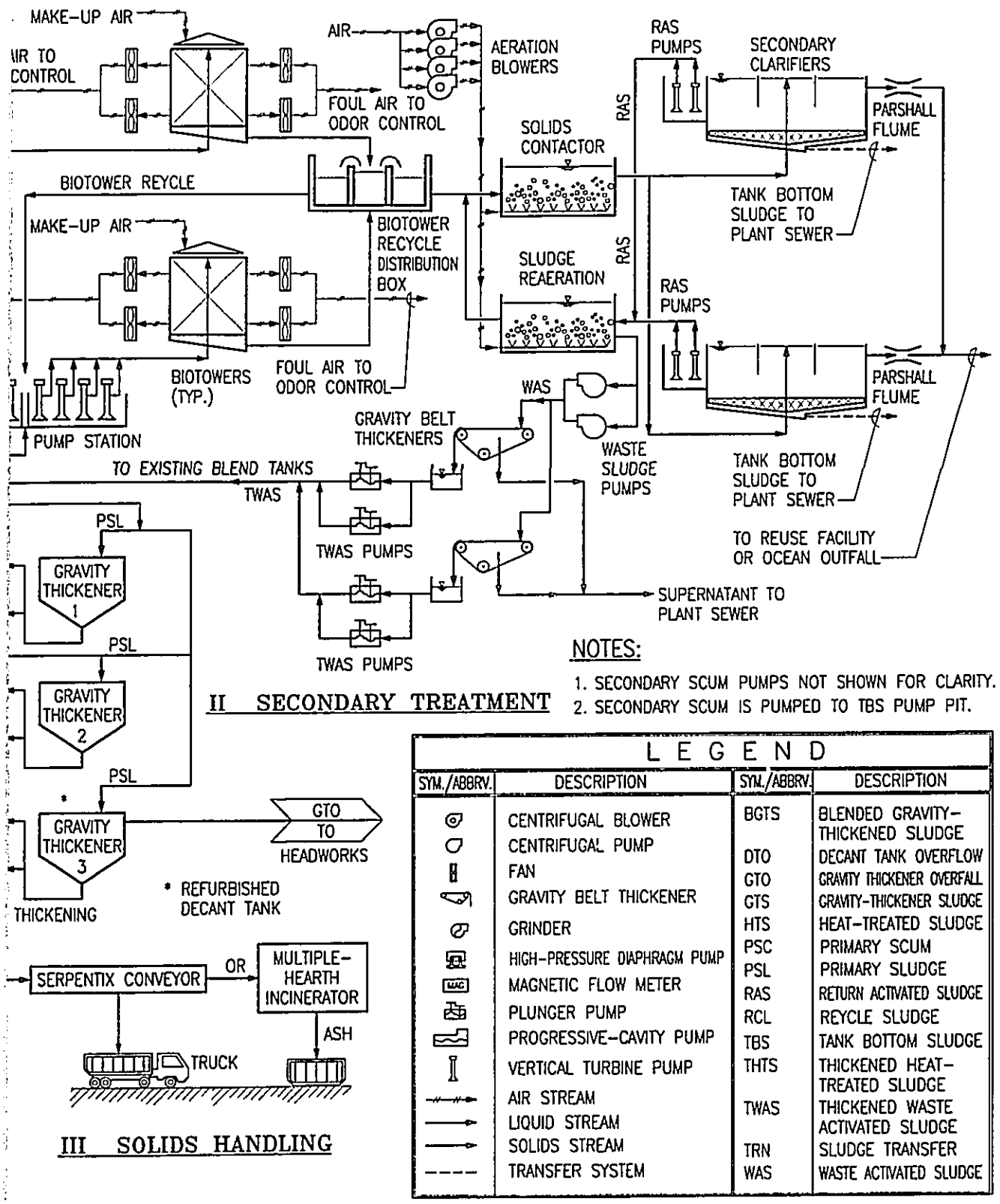


Figure 2-3 HONOULIULI WWTP PROCESS FLOW DIAGRAM WITH CONVENTI

SCH5138F



II SECONDARY TREATMENT

III SOLIDS HANDLING

NOTES:

1. SECONDARY SCUM PUMPS NOT SHOWN FOR CLARITY.
2. SECONDARY SCUM IS PUMPED TO TBS PUMP PIT.

LEGEND

SYM./ABBRV.	DESCRIPTION	SYM./ABBRV.	DESCRIPTION
	CENTRIFUGAL BLOWER	BGTS	BLENDED GRAVITY-THICKENED SLUDGE
	CENTRIFUGAL PUMP	DTO	DECANT TANK OVERFLOW
	FAN	GTO	GRAVITY THICKENER OVERFALL
	GRAVITY BELT THICKENER	GTS	GRAVITY-THICKENER SLUDGE
	GRINDER	HTS	HEAT-TREATED SLUDGE
	HIGH-PRESSURE DIAPHRAGM PUMP	PSC	PRIMARY SCUM
MAG	MAGNETIC FLOW METER	PSL	PRIMARY SLUDGE
	PLUNGER PUMP	RAS	RETURN ACTIVATED SLUDGE
	PROGRESSIVE-CAVITY PUMP	RCL	REYCLE SLUDGE
	VERTICAL TURBINE PUMP	TBS	TANK BOTTOM SLUDGE
	AIR STREAM	THTS	THICKENED HEAT-TREATED SLUDGE
	LIQUID STREAM	TWAS	THICKENED WASTE ACTIVATED SLUDGE
	SOLIDS STREAM	TRN	SLUDGE TRANSFER
	TRANSFER SYSTEM	WAS	WASTE ACTIVATED SLUDGE

IRAM WITH CONVENTIONAL SHAPED DIGESTERS

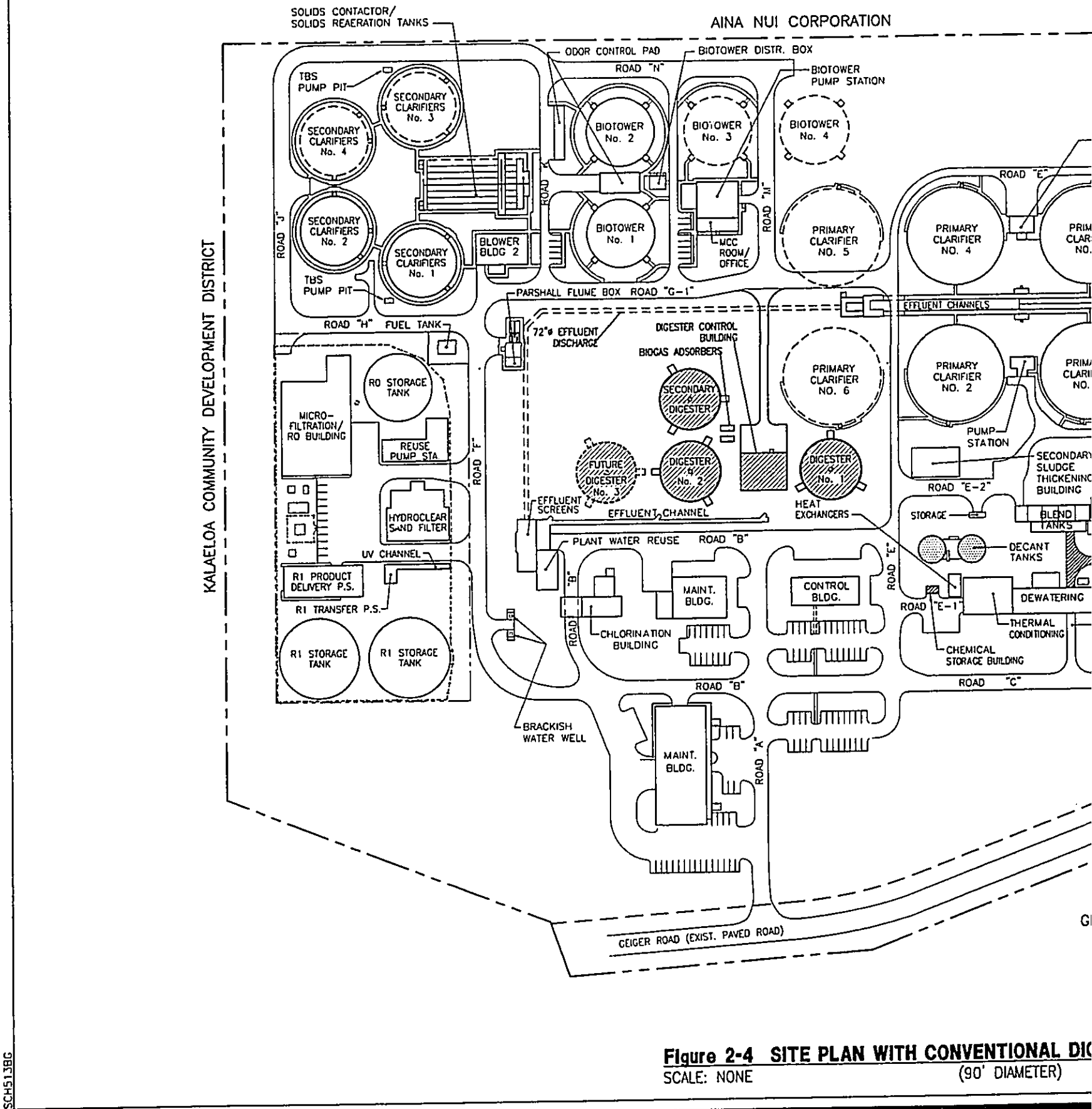
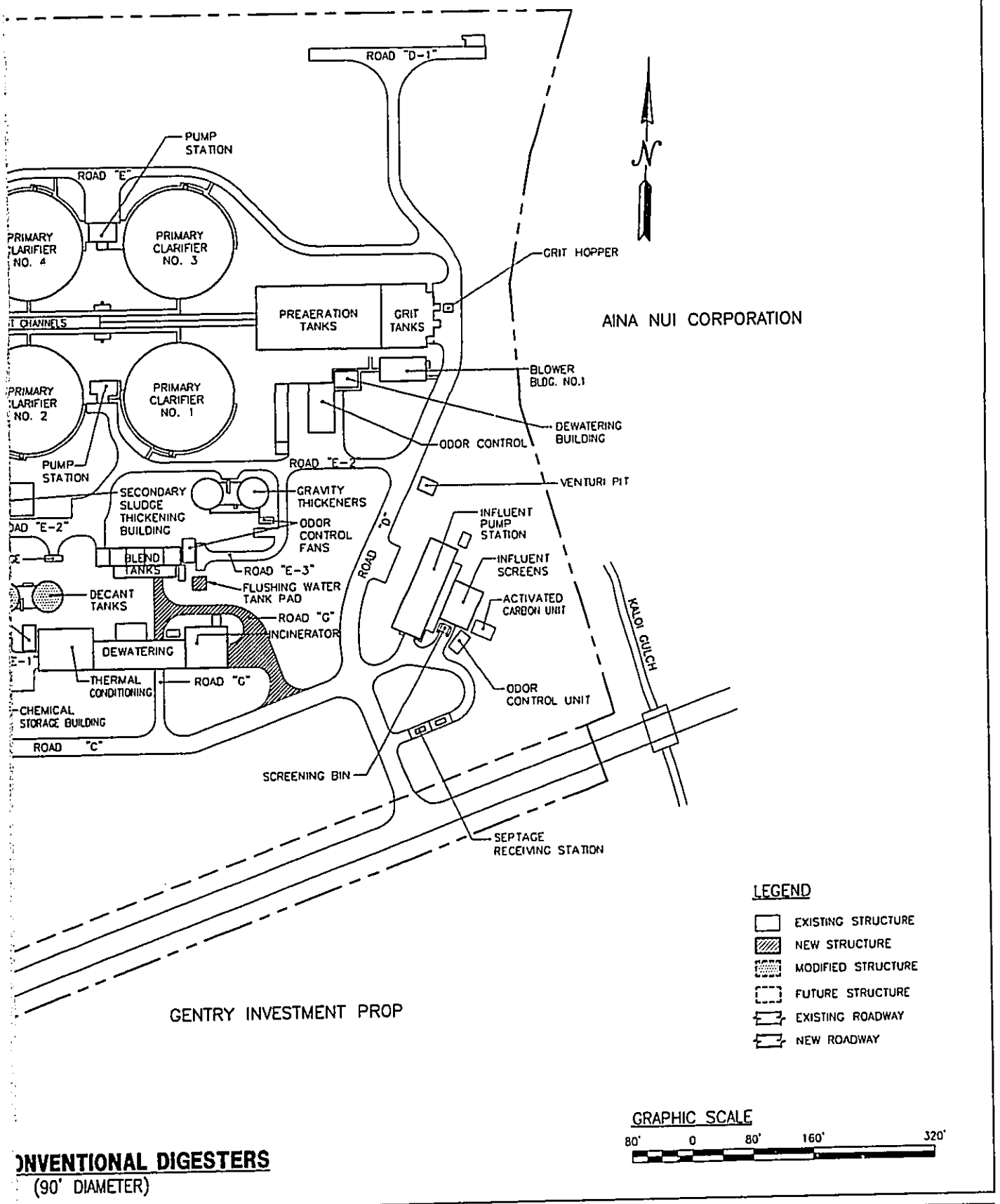


Figure 2-4 SITE PLAN WITH CONVENTIONAL DIG
SCALE: NONE (90' DIAMETER)

SCH513BG



ONVENTIONAL DIGESTERS
(90' DIAMETER)

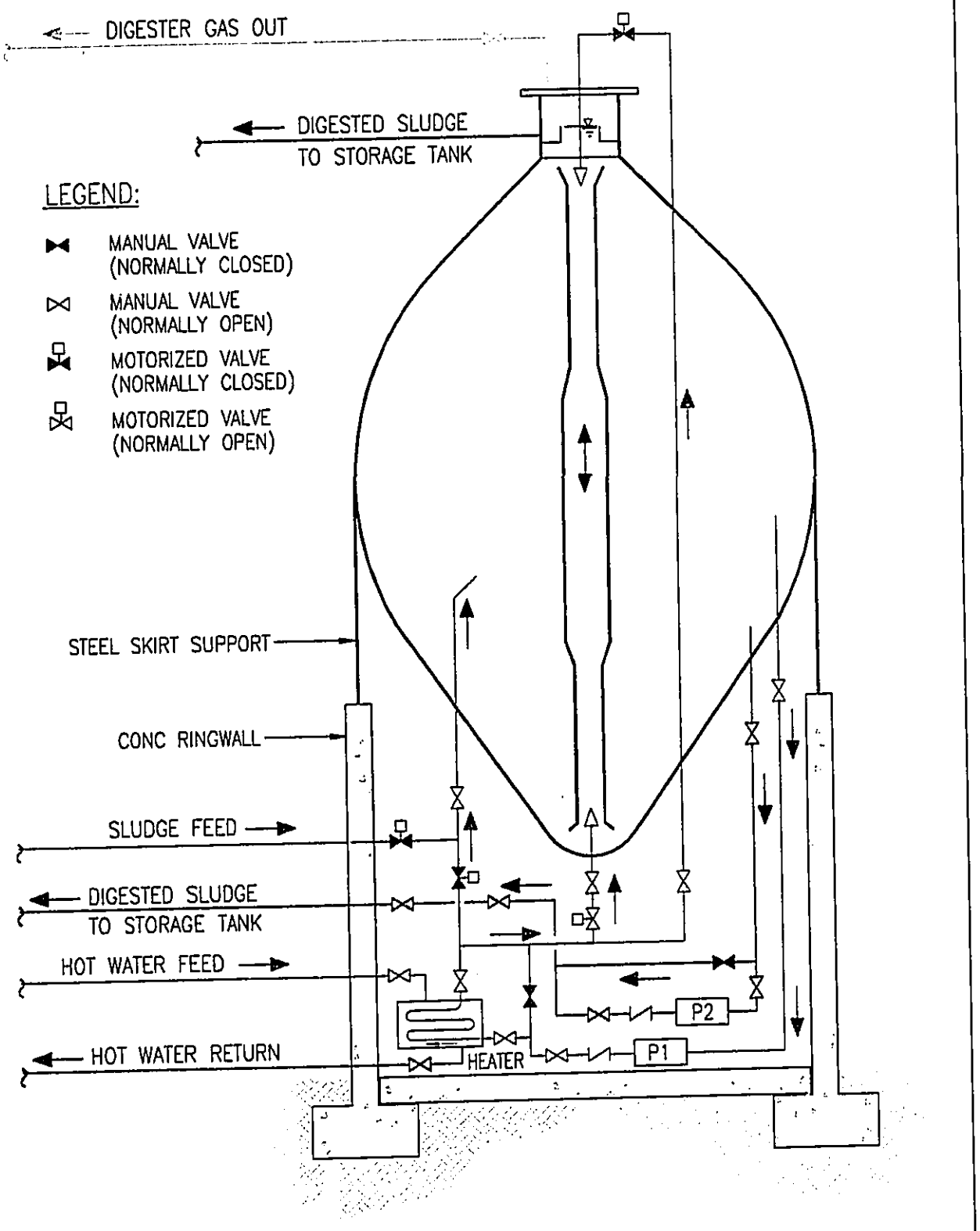


Figure 2-5 EGG SHAPED DIGESTER PROCESS SCHEMATIC

SCH513BM

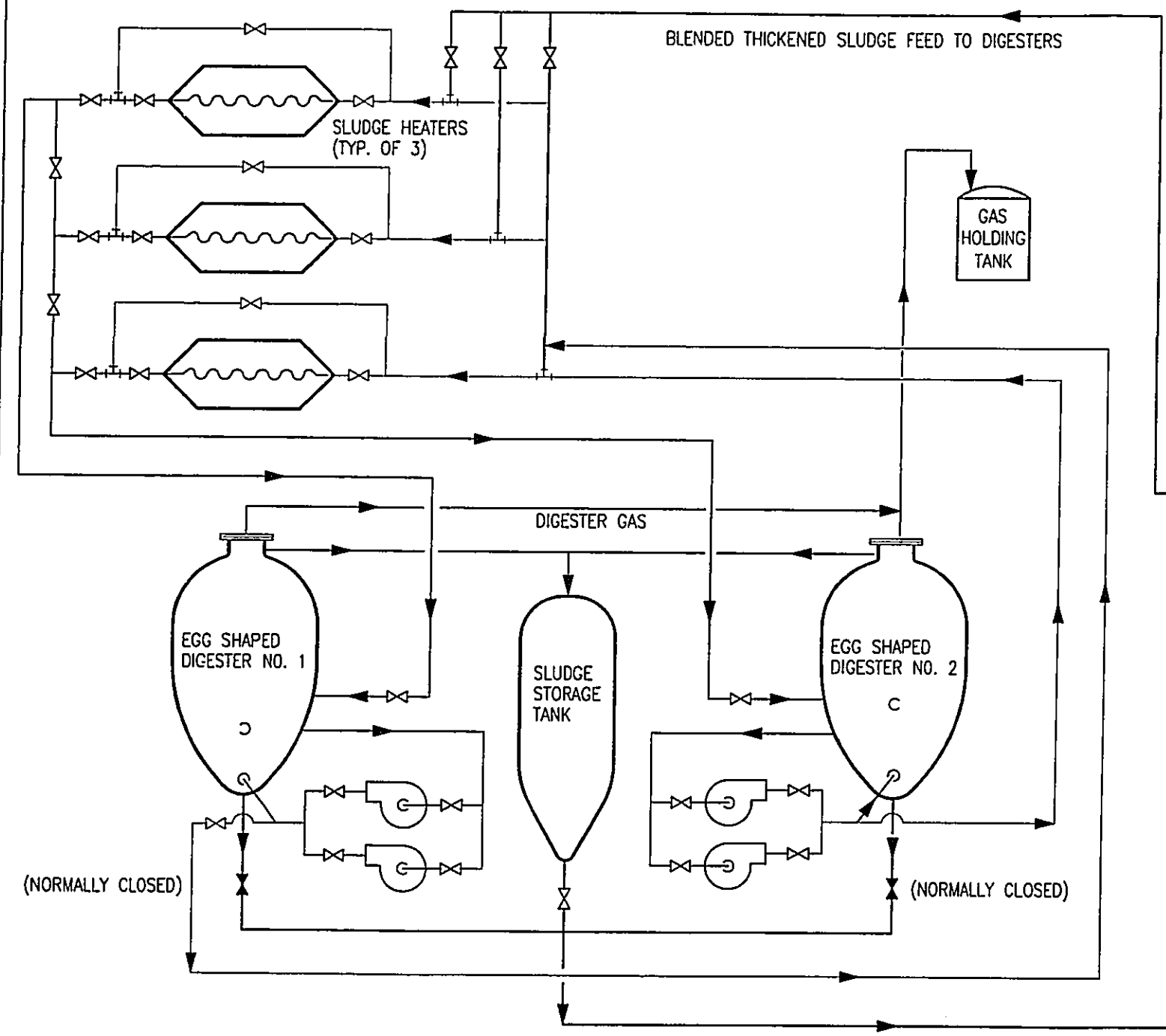
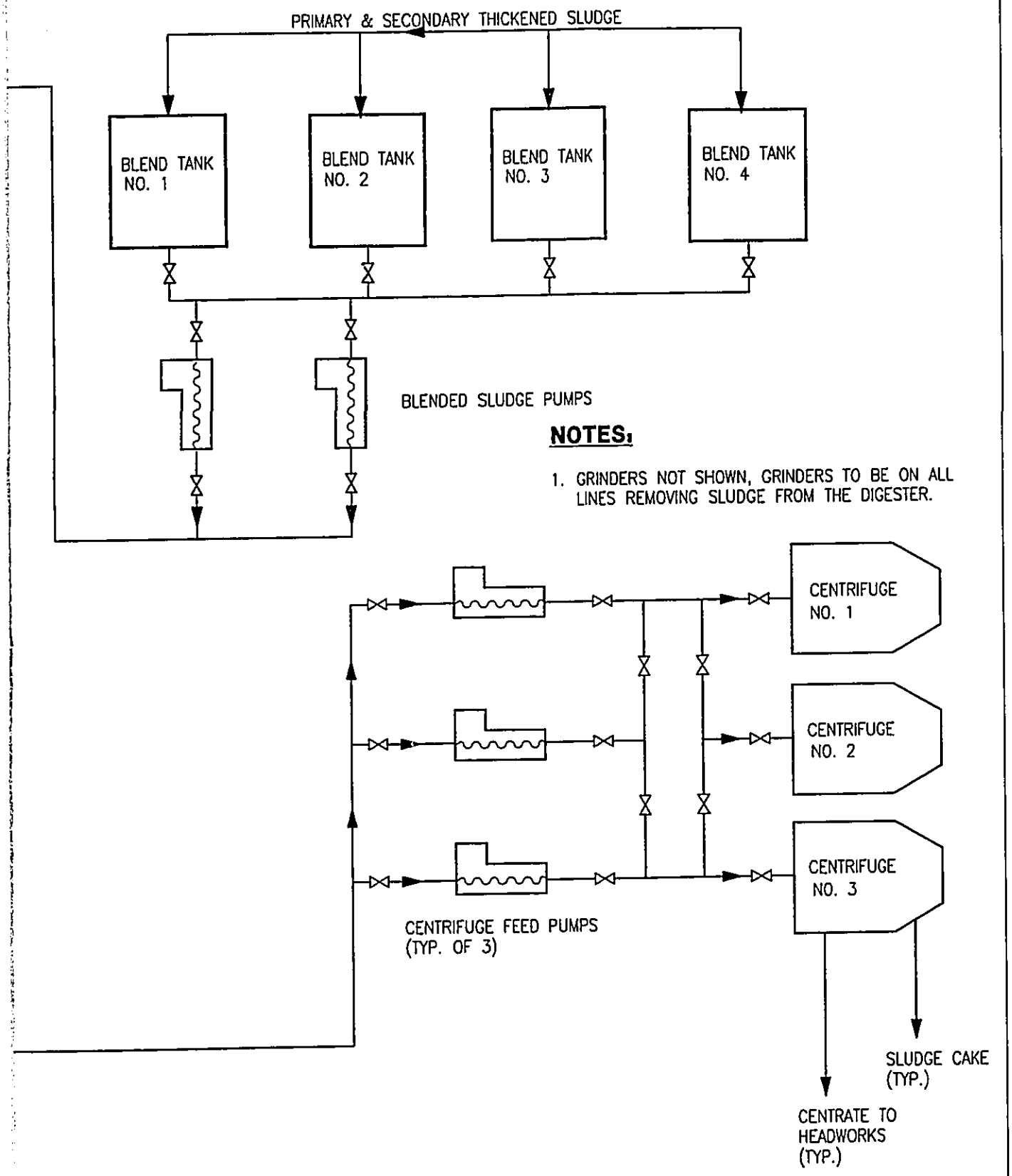


Figure 2-6 PROCESS SCHEMATIC FOR EGG SHAPED DIGE



NOTES:

1. GRINDERS NOT SHOWN, GRINDERS TO BE ON ALL LINES REMOVING SLUDGE FROM THE DIGESTER.

EGG SHAPED DIGESTER OPTION

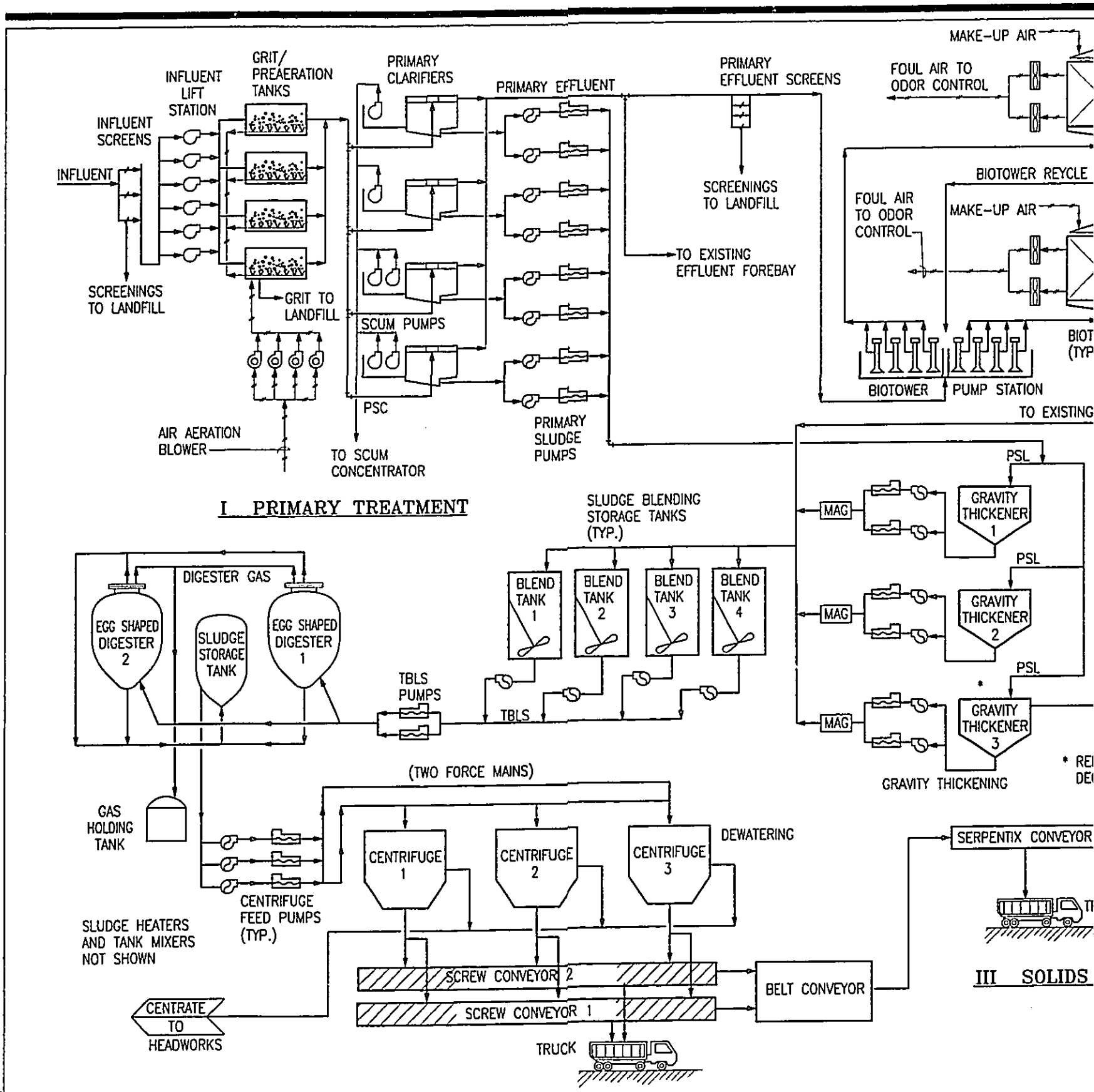
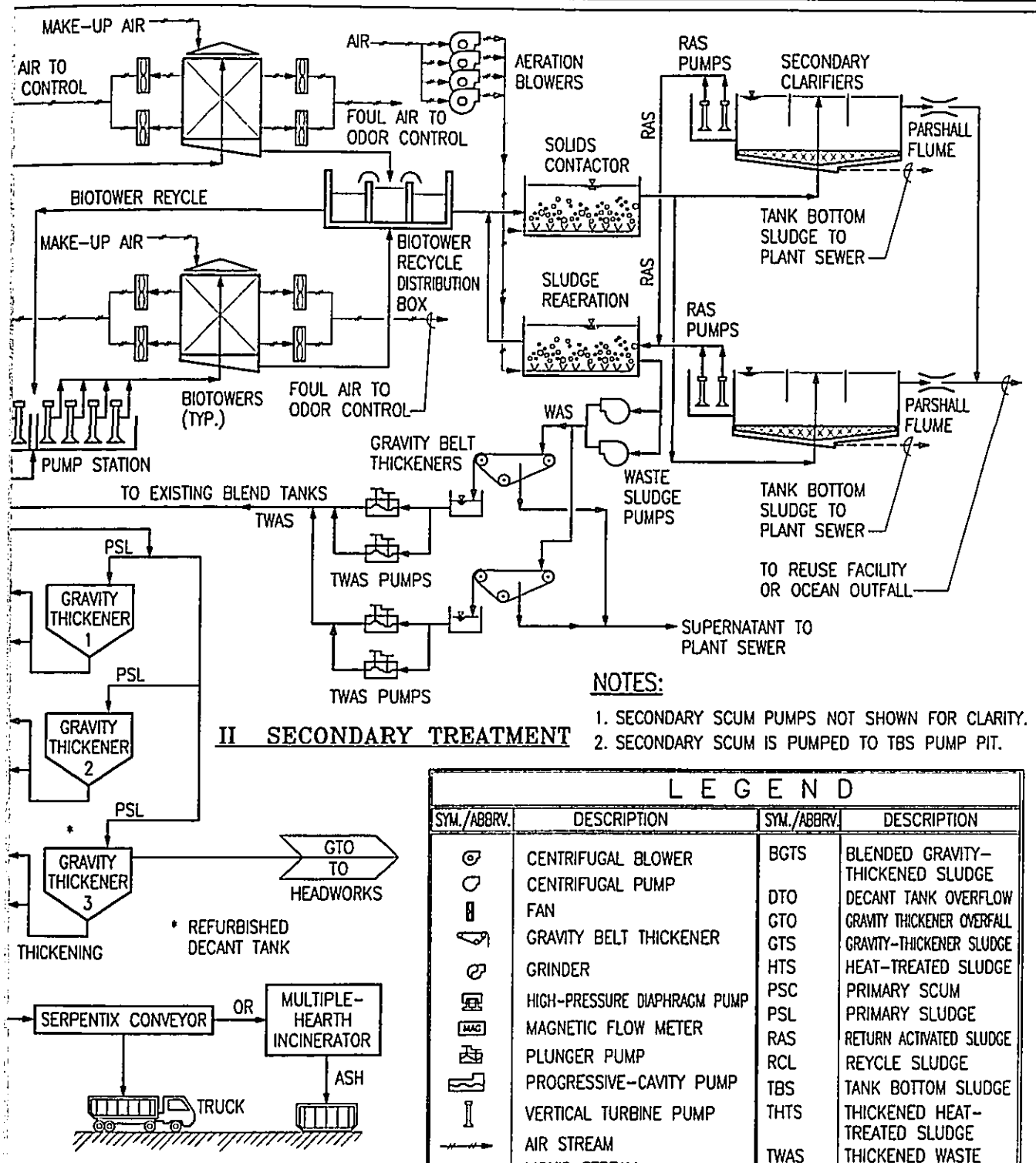


Figure 2-7 HONOULIULI WWTP PROCESS FLOW DIAGRAM WITH E

SCH51381



NOTES:

1. SECONDARY SCUM PUMPS NOT SHOWN FOR CLARITY.
2. SECONDARY SCUM IS PUMPED TO TBS PUMP PIT.

LEGEND

SYM./ABBRV.	DESCRIPTION	SYM./ABBRV.	DESCRIPTION
	CENTRIFUGAL BLOWER	BGTS	BLENDED GRAVITY-THICKENED SLUDGE
	CENTRIFUGAL PUMP	DTO	DECANT TANK OVERFLOW
	FAN	GTO	GRAVITY THICKENER OVERFALL
	GRAVITY BELT THICKENER	GTS	GRAVITY-THICKENER SLUDGE
	GRINDER	HTS	HEAT-TREATED SLUDGE
	HIGH-PRESSURE DIAPHRAGM PUMP	PSC	PRIMARY SCUM
MAG	MAGNETIC FLOW METER	PSL	PRIMARY SLUDGE
	PLUNGER PUMP	RAS	RETURN ACTIVATED SLUDGE
	PROGRESSIVE-CAVITY PUMP	RCL	REYCLE SLUDGE
	VERTICAL TURBINE PUMP	TBS	TANK BOTTOM SLUDGE
	AIR STREAM	THTS	THICKENED HEAT-TREATED SLUDGE
	LIQUID STREAM	TWAS	THICKENED WASTE ACTIVATED SLUDGE
	SOLIDS STREAM	TRN	SLUDGE TRANSFER
	TRANSFER SYSTEM	WAS	WASTE ACTIVATED SLUDGE

DIAGRAM WITH EGG SHAPED DIGESTERS

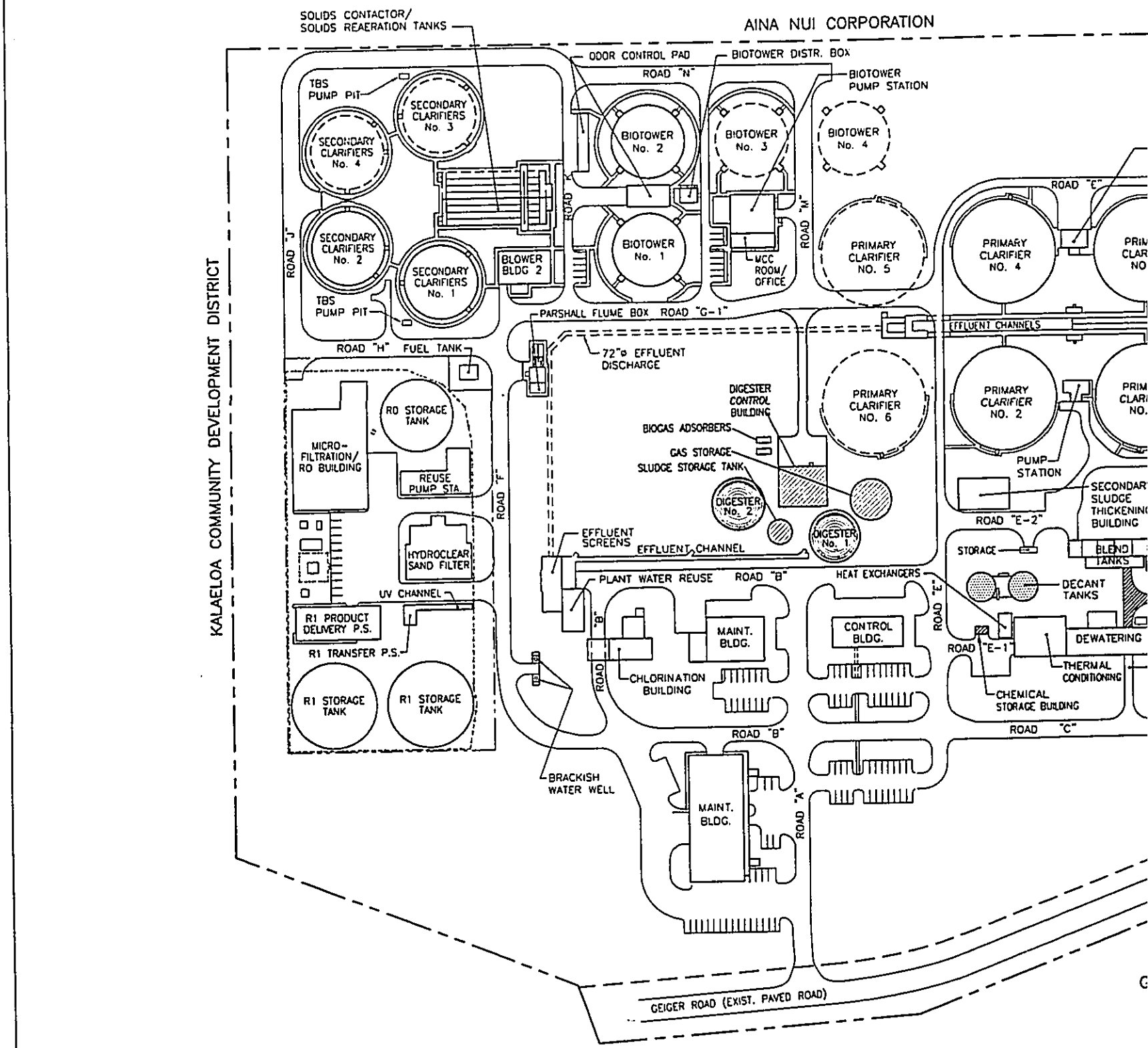
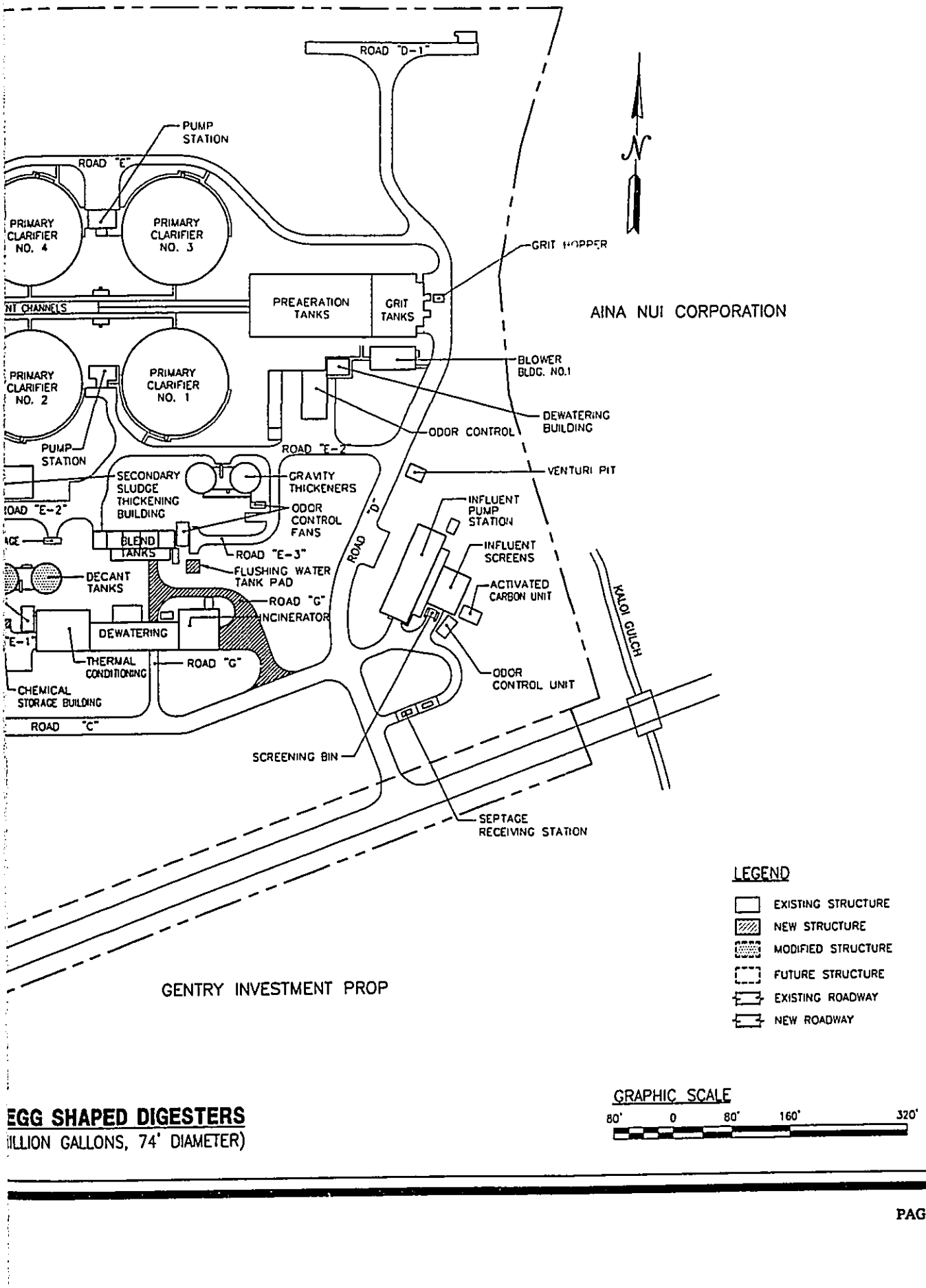


Figure 2-8 SITE PLAN WITH EGG SHAPED DIG

SCALE: NONE (VOLUME OF 1.6 MILLION GALLONS, 74'

SCH513BJ



EGG SHAPED DIGESTERS
ILLION GALLONS, 74' DIAMETER)

2.4 COMPOSTING PRIMARY SLUDGE

Composting is an aerobic bacterial decomposition process used to stabilize organic wastes and produce humus (compost). Compost contains nutrients and organic carbon, which are excellent soil conditioners. Composting takes place naturally on a forest floor where organic materials (leaf litter, animal wastes) are converted to more stable organic materials (humus) and the nutrients are released and made available for plant uptake. The process is slow on a forest floor, but can be accelerated under optimum conditions. The optimum conditions for composting are moisture content of about 50%, a carbon to nitrogen ratio of about 25 to 30, and temperature of 55 °C. Because wastewater sludge is rich in nutrients, its carbon to nitrogen ratio is low (5 to 10). It is also high in moisture. Addition of dry green waste, which is very high in carbon to nitrogen ratio (500) can adjust both the moisture and carbon to nitrogen ratio.

The main goal of any composting facility is to produce consistent high quality compost without having any negative impact on the community in which the facility is located. The major problem is that composting appears so simple and easy that many have felt that by simply making large piles of organic material they can compost on a large scale to meet the needs of major cities. The location and size of the composting facility must comply with any existing regulatory requirements. Most installations with composting programs find that five to 10 acres of fenced land is usually sufficient and successful composting programs stress the importance of establishing a buffer zone, at a minimum 3 miles around the composting facility to address the odor generation from the composting process. While the composting facility should be accessible by road, it should not be too near other commercial activities. An adequate buffer zone will prevent the potential for composting operations to create odors or attract vermin. With composting it is essential to find a market for the use of the end product. Failure to effectively market the compost may ultimately result in more waste being landfilled.

Presently the Honouliuli WWTP is located in a residential area and lacks an adequate buffer zone needed for a composting facility. The need to controls odor from the municipal waste treatment is the main reason for developing an essentially odor free treatment process. Hence odor generation and subsequent control is a vital and important consideration in assessing an alternative to processing sludge.

The option for the primary sludge to be composted on site is not a feasible nor desirable option due to the large buffer zone required to mitigate odors developed by the process. A future option in which the primary sludge is composted off site is a viable one. The City and County of Honolulu's request for bid (RFB) to design, build, and operate a composting facility at the Sand Island WWTP did not generate a responsible bid.

2.5 NO ACTION

The "No Action" alternative could not support the anticipated growth of West Oahu. This restriction could affect the City and County's General Development Plan and potentially affects the stability of the local construction industry and real estate market.

Without the proposed alternative of introducing anaerobic digestion, the Honouliuli WWTP would continue to heat-treat sewage at its existing capacity and send the dewatered sludge to the US Navy under the existing Consent Decree. If the US Navy terminates its agreement to accept the dewatered sludge it would be sent to the Waimanalo Gulch Landfill.

Due to the fact that the solids handling facilities at Honouliuli WWTP is near capacity, the "No Action" alternative would create a moratorium on the future connections to service area sewers. This would profoundly restrict growth and development for the identified service area. "No Action" would prohibit the expansion of secondary treatment and limit the plant's capacity to reclaim water for use.

In addition, the existing equipment at Honouliuli is almost 20 years old and undergone major repairs. Replacement for parts is extremely difficult. Currently, one manufacturing holds all patents for heat treatment and likely would fabricate only on a custom basis. This condition not only threatens the plant operation and its ability to support its current and future service area but may also results in a non-reusable, malodorous material to be disposed of.

The "No Action" alternative has been rejected based on the many adverse effects it may have on the economy, environment, and socio-economic growth of West Oahu.

SECTION 3
EXISTING ENVIRONMENT

SECTION THREE

EXISTING ENVIRONMENT

The following section describes the existing environment in the general vicinity of the plant site. Significant land use changes have occurred in the area surrounding the Honouliuli WWTP since 1984 when the plant and incinerator were put into service. Subsequently, the discussion below is more reflective of a growing urban center than the rural/agriculture setting that existed in 1984.

3.1 HONOULIULI WWTP LOCATION

Honouliuli WWTP is located on Geiger Road in the Leeward Oahu town of Ewa Beach. The treatment plant serves the western portion of the Mamala Bay sewerage district. The district covers an area of over 162 square miles and serves a resident population of 228,340 (Census 2000). The location of the Honouliuli WWTP is shown in Figure 3-1.

The Honouliuli WWTP serves the western portion of the Mamala Bay Sewerage District. The service area is bounded on the south and southwest by the Pacific Ocean; on the northwest by Schofield Barracks; on the north by Schofield Barracks, Leilehua Golf Course and Wheeler Air Force Base; on the northeast by the crest of the Koolau Mountains; and, on the southeast by Honolulu limits.

This service area includes all commercial, agricultural and residential regions, except Pearl Harbor, Wahiawa-Whitmore Village and Campbell Industrial Park. These communities have their own WWTPs to treat sewage. Sludge from Wahiawa-Whitmore Village is transported to Honouliuli WWTP for treatment. Figure 3-2 shows the limits of the Honouliuli WWTP service area.

3.2 HONOULIULI WASTEWATER TREATMENT PLANT: PLANT OPERATION

The Honouliuli WWTP is the City and County of Honolulu's second largest wastewater facility and it serves one of the fastest growing areas within the State of Hawaii. The rapid growth occurring in its service area has resulted in an increasing wastewater loading that has demanded the plant undergo numerous modifications to keep pace with the demands.

The Honouliuli treatment plant was originally constructed from 1979 to 1984 and placed into full operation in December 1984. The original plant treated wastewater only to the primary level with a design capacity of 25 million gallons per day (mgd). The original plant consisted of three influent bar screens, an influent pump station, three aerated grit removal chambers, three preaeration tanks, two circular primary clarifiers, three effluent fine screens, an effluent forebay, two gravity thickeners, four sludge storage or blend tanks, a heat treatment unit, two decant tanks, three centrifuges and a multi-hearth incinerator.

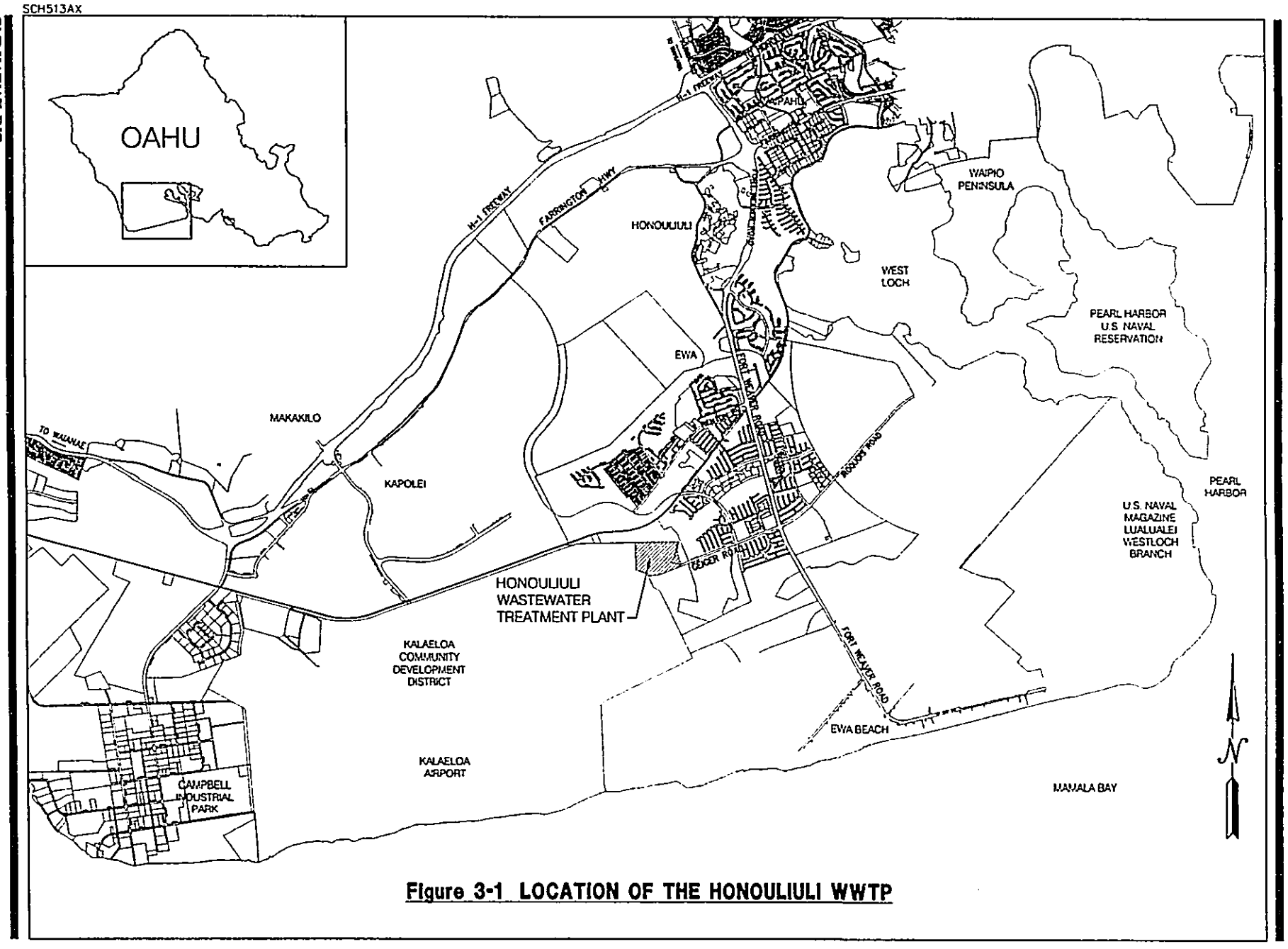


Figure 3-1 LOCATION OF THE HONOULIULI WWTP

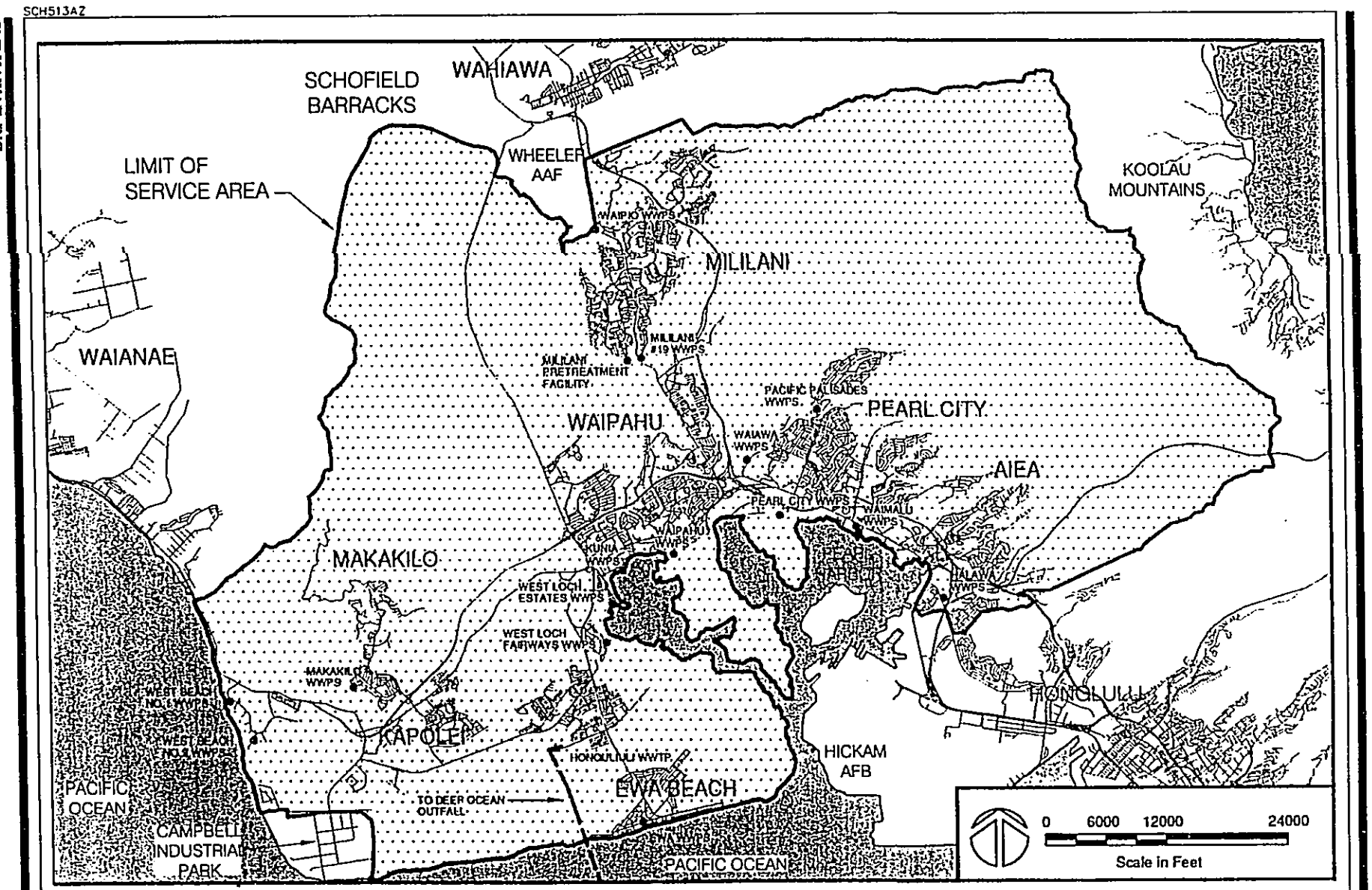


Figure 3-2 HONOULIULI WWTP SERVICE AREA

REPRODUCED FROM FIGURE 2-9, WEST MAMALA BAY FACILITIES PLAN, CITY AND COUNTY OF HONOLULU, DEPT. OF DESIGN AND CONSTRUCTION, 1999.

The Honouliuli WWTP was expanded in two phases to meet additional wastewater flows. The first expansion Phase I was divided into two parts: Part A and Part B. Part A included an influent pumping station, grit removal and pre-aeration, and primary clarifiers and odor control for hydrogen sulfide. Part B included the addition of a new boiler and boiler building, brackish water wells, additional office space, replacement of sludge pumps, and carbon vessel. Phase I increased the wastewater capacity of the plant to 51 mgd by adding two circular clarifiers.

The second expansion, Phase II, called Unit 1A, consisted of two increments. Increment I added the secondary treatment to the plant. The second increment of Unit 1A (which was not constructed) would have increased the capacity of the solids handling facilities to treat the solids generated by the 51 mgd of wastewater.

The addition of secondary treatment resulted in the generation of additional solids, which had the effect of down rating the solid stream capacity from an equivalent 38 mgd wastewater flow to between 27 and 28 mgd.

Phase II Unit 1A, Increment II was never constructed because the City and County of Honolulu decided to seek options for sludge stabilization other than heat treatment, and for disposal other than incineration

In addition to the plant expansions, a water reclamation facility was added in 1999, and occupies 5 acres of the plant site.

The odor control facilities constructed during Phase I include a pair of scrubbers and several granular activated carbon (GAC) absorbers. The scrubbers remove most of the H_2S in the foul air from the grit/preaeration tanks, primary clarifiers, gravity thickeners and sludge storage/blend tanks. After the scrubbers, GAC absorbers remove the remaining malodorous compounds in the foul air. A separate GAC system treats foul air from the influent screens and IPS. A vacuum belt thickener was also installed under Phase I as part of the scrubbing system.

The Unit 1A expansion provided partial secondary treatment for the Honouliuli plant. This expansion added a biotower pump station, two biotowers, a solids contactor, a solids reaerator, two secondary clarifiers, a blower building, two Parshall flumes, two gravity belt thickeners and a secondary sludge thickening building. The new secondary treatment facilities receive up to 13 mgd of the flow from the existing primary clarifies. Secondary effluent is fed to the water reclamation facility while any excess is remixed with the remaining primary effluent at the effluent fine screens. The combined effluent then flows to the Barbers Point Ocean Outfall for final disposal.

The water reclamation facility takes secondary effluent from the secondary treatment process and converts up to 10 mgd to R-1 quality irrigation water and up to 2 mgd industrial quality water.

Odor control facilities were also constructed during Unit IA. The Secondary Odor Control system, consisting of two catalytic scrubbers and five GAC absorbers, collects and treats foul air form the Biotower Pump Station (BPS), biotowers, solids contractor and solids reaerator. A separate odor control system, consisting of two GAC absorbers, collects and treats foul air from the gravity belt thickeners.

3.2.1 Primary Treatment at Honouliuli WWTP

Primary treatment separates trash, grit, settable solids and floating materials from the raw wastewater. At Honouliuli WWTP, this is done by the four sequential unit operations called screening, grit removal, preaeration, and clarification. Raw wastewater enters the plant at the headworks and passes through three mechanically cleaned bar screens where trash is collected. This material is sent to the Waimanalo Gulch Landfill. After screening, sewage is pumped up to two sets of aerated tanks connected in series. Grit is removed by gravity in the first set, while septicity is further reduced in second set. Grit is also landfilled. Wastewater is then treated in primary clarifiers where settable solids are collected at bottom of the tank and floating materials, i.e. scum, at the surface. The former is primary sludge, which is pumped to the solids stream for stabilization and dewatering. Scum is pumped to a concentrator in the Solids Handling building before being blended with the dewatered sludge.

3.2.2 Secondary Treatment at Honouliuli WWTP

Secondary Treatment at Honouliuli WWTP is the trickling filter-solids contactor (TF/SC) process. It consists of the BPS, two biotowers, a solids contactor, a solids reaerator and two secondary clarifiers.

Figure 3-3 illustrates the secondary treatment process at the facility. Approximately half of the primary effluent is pumped to the top of the biotowers where microorganisms in contact with the effluent remove dissolved organic pollutants and oxidize ammonia to nitrate. Wastewater flows from the tower to contact tanks where it mixed with secondary sludge recycled from the secondary clarifiers. The mixture is separated in clarifiers by gravity. Currently, between 7 to 8 mgd of secondary effluent is sent to the water reclamation facility while the remainder is remixed with primary effluent before fine screening. The combined effluent flows through fine screens before being discharged to the ocean through an outfall located at a depth of 200 feet and 8,760 feet offshore. The secondary sludge is aerated in a separate set of tanks before being recycled. Biological treatment generates cell material. Hence, a small portion of the secondary sludge stream is diverted to two gravity belt thickeners to prevent accumulation. This thickened waste activated sludge (TWAS) is then sent to the solids stream for further treatment. The secondary clarifiers also capture scum and heavier particles called tank bottom sludge (TBS). Currently, TBS is recycled to the head of the plant.

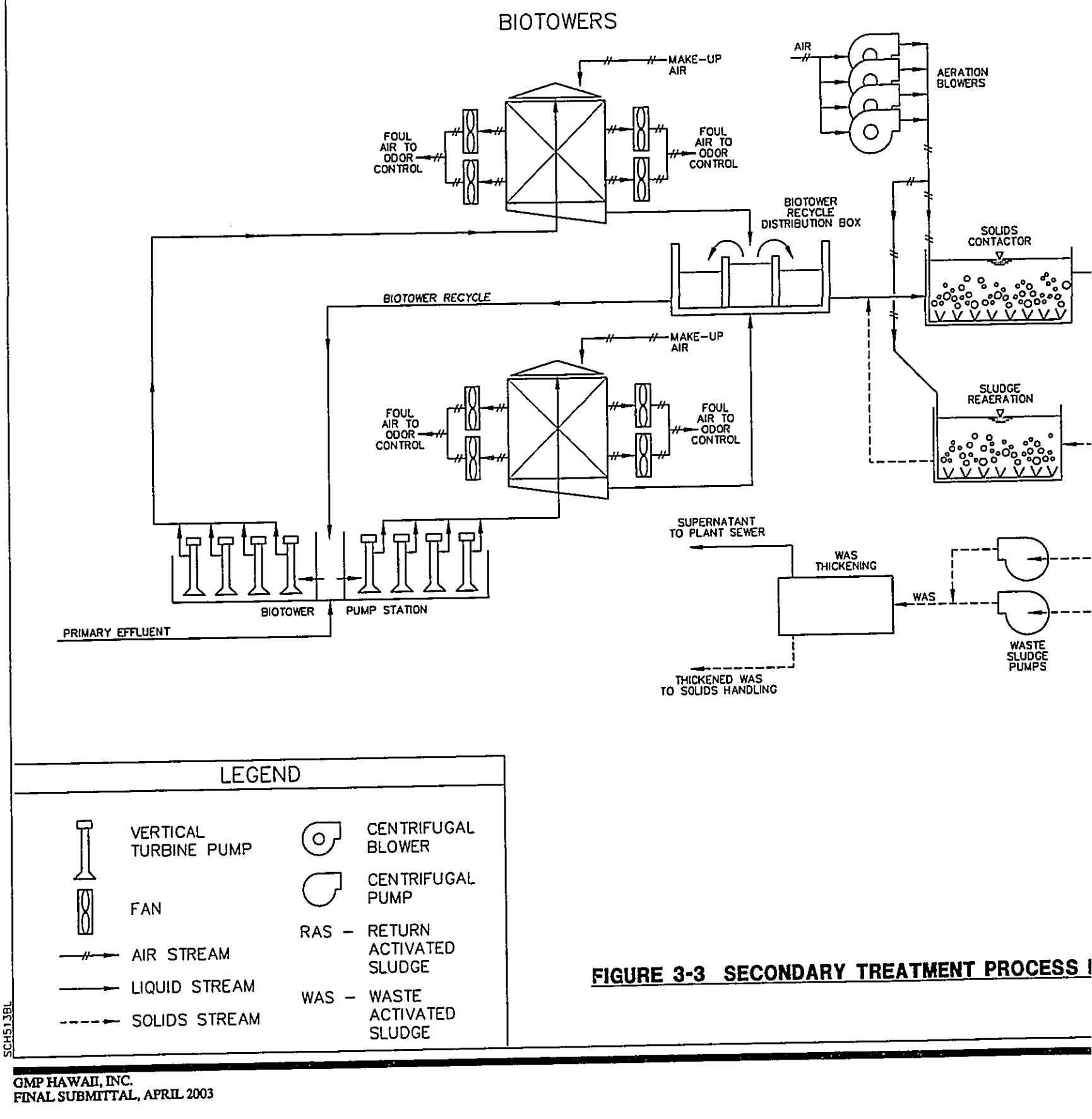
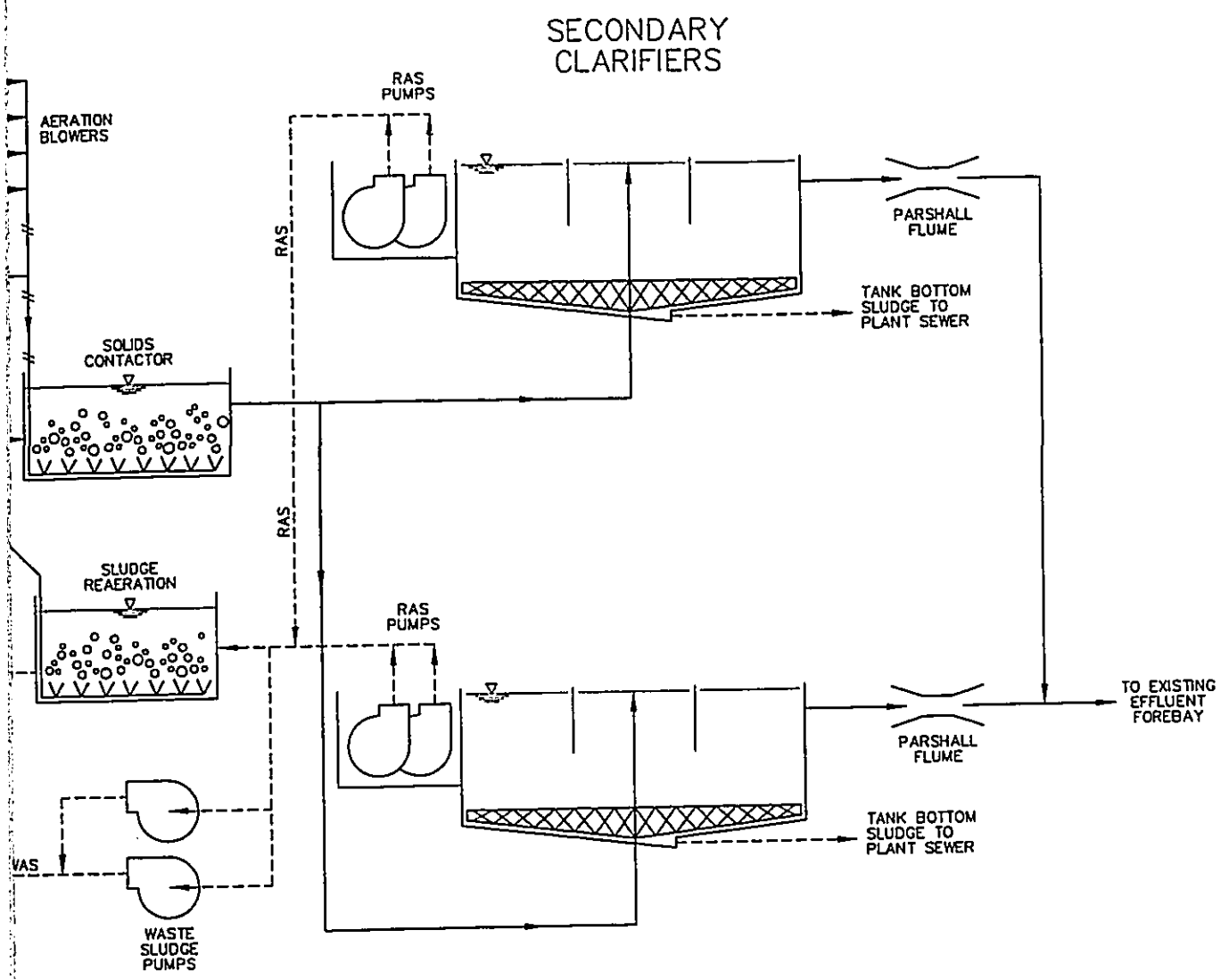


FIGURE 3-3 SECONDARY TREATMENT PROCESS I



MENT PROCESS FLOW DIAGRAM

3.2.3 Solids Stream Processing

Primary Sludge is pumped directly from the clarifiers to a gravity thickener to increase its concentration. The thickened sludge (GTS) is pumped to a blend tank where it is mixed with TWAS and then sent to heat treatment. This stabilization process heats sludge to 375°F for 30 minutes. The stabilized sludge is sent to a decant tank to increase its concentration. The decanted heat-treated sludge is either pumped to a centrifuge, which dewaters the viscous sludge to cake, i.e. similar in appearance and consistency to moist soil or to a blend tank for temporary storage. Currently, the sludge cake is trucked to the Navy Composting site.

The heat treatment equipment is approaching the end of its useful life and being operated near its capacity. In the interim before the anaerobic digestion process is brought into operation, GTS and TWAS will be directed to separate blend tanks. The former will be heat treated while the latter will be dewatered before disposal.

A multiple hearth incinerator was constructed to reduce dewatered sludge to a sterile ash. However, it has not been operated in recent years.

3.3 CLIMATE

The climate characteristics found on Oahu differs significantly from what is commonly ascribed to tropical conditions. Temperatures and humidity are moderate throughout the year and normally, steady trade winds blow from the northeast across the islands. This is a result of Oahu's marine location remote from any continental land mass and the presence of a stationary anticyclone (high pressure cell) to the north and east of the Hawaiian Island Chain.

Two well defined seasons, summer and winter, characterize Oahu's climate. Summer occurs in May through September, and is marked by a persistent trade wind flow. The winter months occur during October through April when trade wind flow is interrupted by frequent storms. Most of the rainfall in the lowlands is derived from winter storms.

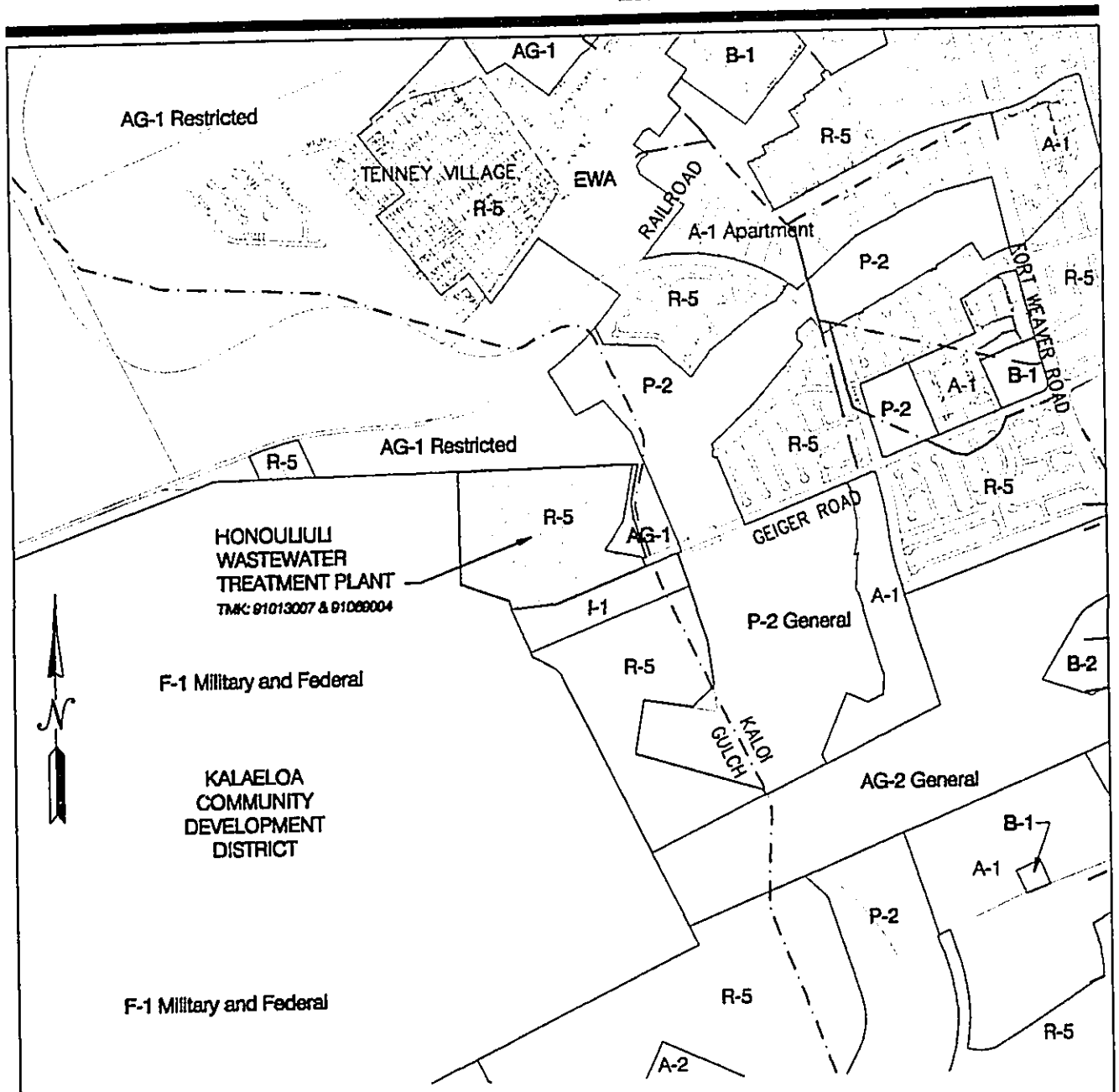
Equable temperatures, persistent trade winds, moderate humidity, and slight rainfall characterize the Barbers Point area. The mean temperature during summer months is 79°F and 72°F during the winter. Average annual rainfall is about 20 inches. Northeasterly trade winds predominate during most of the year with a mean speed of 9 knots. Southerly Kona winds occur occasionally during the winter months.

3.4 EXISTING LAND USE AND ZONING

The Honouliuli WWTP site is identified by Tax Map Key 9-1-013-007 and the adjacent TMK 9-1-069-004, and is located in the City and County's Ewa District. Figure 3-4 shows Zoning for the WWTP site and surrounding areas. The WWTP property is

designated Urban State Land Use District and zoned R-5 (Residential district) by the City and County.

The adjacent properties north of the WWTP have been zoned Ag-1 (Agriculture restricted). Property east of the WWTP is also Ag-1. A strip of land south of the WWTP property is zoned I-1 (Industrial limited) and then proceeds to R-5 (Residential district). Properties southeast of the WWTP are P-2 (Preservation restricted). The property to the west of the WWTP is former Barbers Point Naval Air Station (NAS) and zoned F-1 (Military and Federal).



TITLE	MAP	TITLE	MAP
Preservation Restricted Military/Federal General	P-1 F-1 P-2	Residential Restricted	R-20 R-10 R-7.5 R-5 R-3.5
Agricultural Restricted General	AG-1 AG-2	Apartment Low-density Med-density High-density	A-1 A-2 A-3

Figure 3-4 HONOULIULI WWTP ZONING AND SURROUNDING PROPERTIES

SCH513BN

The General Plan of the City and County of Honolulu was amended by Ordinance No. 4136 dated April 16, 1973 to change the land use of the site from military and agriculture to public facility (PF). Public facilities are permitted on lands zoned as Residential, R-5, and Agriculture, AG-1.

The project site was at one time located with the Special Management Area (SMA) of the City and County of Honolulu. The boundary of the SMA has since been revised such that the plant site is now mauka of the revised boundary.

The current pattern of land use in the project area is a consequence of several contributing factors, including state and county land use regulations, availability of public infrastructure, land ownership, initiative of private developers, particularly Campbell Estate, and the environmental attributes of the regions.

The *Atlas of Hawaii* (University of Hawaii, 1998) summarizes recent regional development trends in leeward Oahu. The Campbell Estate planned as early as the 1950s urbanization of the Ewa Plain under public/private partnership due to the demise of large-scale agriculture. This plan had become government policy in the 1970 and the goal to establish a growth center, with its own harbor and diversified employment based on about 32,000 acres, approximately 8 percent of Oahu's land had been set.

As of early 1996, a number of industries had invested in Barbers Point Harbor and the James Campbell Industrial Park, and a tourist resort had opened at Ko'olina. Residential housing development between 1990 and 1994 witnessed 5,000 new housing units. Plans for an additional 40,000 more are set for construction by 2012.

The existing Campbell Industrial Park, Kapolei Business Park, Barbers Point Harbor, the former Barbers NAS and residential communities characterize Land uses for leeward Oahu.

Campbell Estate opened the 1,367-acre James Campbell Industrial Park (CIP) in 1958 and provided the largest industrial park and only heavy industrial park in Hawaii. The park has more than 300 tenants and provides nearly 4,000 jobs. The park's tenants represent a range of industries, including manufacturing, recycling, import/export, power generation, construction, warehousing and distribution. Major recent industrial uses in the park include the City and County's H-POWER facility and the first privately owned electrical power generating station (AES Barbers Point Cogeneration facility) built under contract to HECO.

The 895-acre Kapolei Business Park is the Estate of James Campbell's new, light industrial park adjacent to the City of Kapolei. Kapolei Business Park features flexible lot sizes intended for light manufacturing, processing, suppliers, wholesalers, warehouses, and distribution companies. It is zoned I-2.

Barbers Point Harbor is a state owned harbor that has been developed to divert some shipping from the overcrowded Honolulu Harbor. Facilities include a 1,600-foot pier, 30 acres of paved back up area and related infrastructure.

Former Barbers Point NAS is roughly three miles long and two miles wide and covers approximately 3,700 acres. The NASBP closed in 1999 and transferred a portion of the Base to the State for use as a civilian public-use general aviation reliever airport (Kalaeloa Airport Master Plan 1998). About one third of the land area is utilized for runways and associated taxiways, aprons, and aircraft tie down areas. The area has been re-named Kalaeloa Airport and is within State of Hawaii, Department of Transportation jurisdiction.

Kapolei has been one of the fastest growing areas in the State of Hawaii. A number of communities in the area are in the process of being developed and others are in the planning and approval processes. Existing residential communities include Ewa Beach, Ewa Villages, Ewa by Gentry, West Lock Estates, Villages of Kapolei, Makakilo, and Honokai Hale.

In Hawaii, both state and county governments affect regulatory controls over land use. At the state level, land use districts are established to control broad scale land use patterns. Districts include Urban, Rural, Agriculture, and Conservation. The Honouliuli WWTP site is designated Urban.

State land use districts designations in the study area are exclusively agriculture and urban (LUC). Coastal lands, including former Barbers Point NAS, CIP, Barbers Point Harbor and Kahe Point, are all in the urban district, except for a small band of agriculture land extending down Waimanalo Gulch to the sea. With only a few exceptions, the remaining agriculture lands are small remnant parcels destined for urban expansion. Several larger agriculture areas are found between Makakilo and Honouliuli, and the area inland of CIP and Barbers Point Harbor.

City and County of Honolulu land use regulations evolves from broad principles established in a general plan. The *City and County of Honolulu General Plan* (1992) is a statement of the long range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu. The Plan specifies objectives and policies for the population, economic activity and physical development of leeward Oahu:

- Population - "Encourage development within the secondary urban center at Kapolei and the Ewa and Central Oahu urban fringe areas ..."
- Economic activity - "Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei"
- Physical development and urban design – "To develop a secondary urban center in Ewa with its nucleus in the Kapolei area". Policies supporting this objective include funding public projects to facilitate development of the area, encourage development

of residential, commercial and employment centers at Kapolei, and Barbers Point as a major industrial center.

- Transportation and Utilities-"To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound system of waste disposal." "Provide safe, efficient and environmentally sensitive waste-collection and waste disposal services."

The City and County's *General Plan* is implemented through the Development Plans that establish long-range land use patterns. The City and County of Honolulu's *Development Plan Common Provisions* specify general design principles and controls for new development. For land use planning purposes, Oahu is divided into eight geographic areas. The Ewa area compasses the present study area. The Ewa Development Plan strongly supports the development of the secondary urban center with the intention for the area to experience tremendous growth through the year 2020. The Plan supports the expansion of the Honouliuli WWTP.

3.5 TOPOGRAPHY AND GEOLOGY

Ground elevations at the project site range from 32 feet above mean sea level at Geiger Road to 42 feet at the mauka boundary. The site is generally flat due to previous grading and landscaping operations. Adjacent areas are also relatively flat and void of any significant surface features.

The project site is part of the Ewa Plain, created during the later stages of the geological history of Oahu. As the region sank, stream sediments from Waianae and Koolau volcano ranges were deposited, creating alluvial plain formations. Then during the warmer, interglacial stages of the Ice Age, the sea level rose above its present height, giving rise to coral reef growth across the plain. Later during the glacial stage of the Ice Age, sea levels declined due to the accumulation of water in the glaciers. The existing reef became exposed to rain water and decaying vegetation, resulting in slightly acidic groundwater. The acidic nature of the groundwater created large, open cavities throughout the natural reef.

Soil borings taken in 1974 showed that groundwater levels are an estimated 35 feet below ground elevations throughout the plant site. The caprock aquifer is 100 to 200 feet thick in most places and consists of brackish, slightly acidic water.

At least 45 feet of soft to moderately hard coral reef formation and some stiff clay underlie the site. Materials near the surface are relatively hard due to the solution and re-deposition of calcium. Underlying portions of the ancient reef vary from soft to hard corals with lattices and voids, some of which are filled with reef debris, sand, and or clay.

Soils found at the plant site consist of Laulualei-Fill land, Ewa soil associations. Most overlying soils are made up of Mamala Stony, silty, clay loam coral rocks and consolidated coral sands. Soils along the eastern boundary are Ewa silty loams and Waialua silty clays.

Figure 3-5 shows the Honouliuli WWTP's location on the USDA Soil Conservation Service Soil Survey Map.

3.6 DRAINAGE

Stormwater runoff in the Ewa area collects in Kaloi Gulch. The Kaloi Gulch transverses between Tenny and Varona Village and along the eastern boundary of the Honouliuli WWTP to the ocean. Former Barbers Point NAS and the Honouliuli WWTP site are classified as Zone D lands in the Federal Flood Insurance Rate Map, as shown in Figure 3-6. The Zone D designation indicates that the potentials for flood hazards have not yet been determined for that area. Portions of Ewa Village and Varona Village are classified as Zone A special flood hazard areas susceptible to 100-year flood inundation.

Any runoff or storm water that is a result of the proposed development will be disposed of on site at a percolation basin.

3.7 ARCHAEOLOGICAL AND HISTORIC RESOURCES

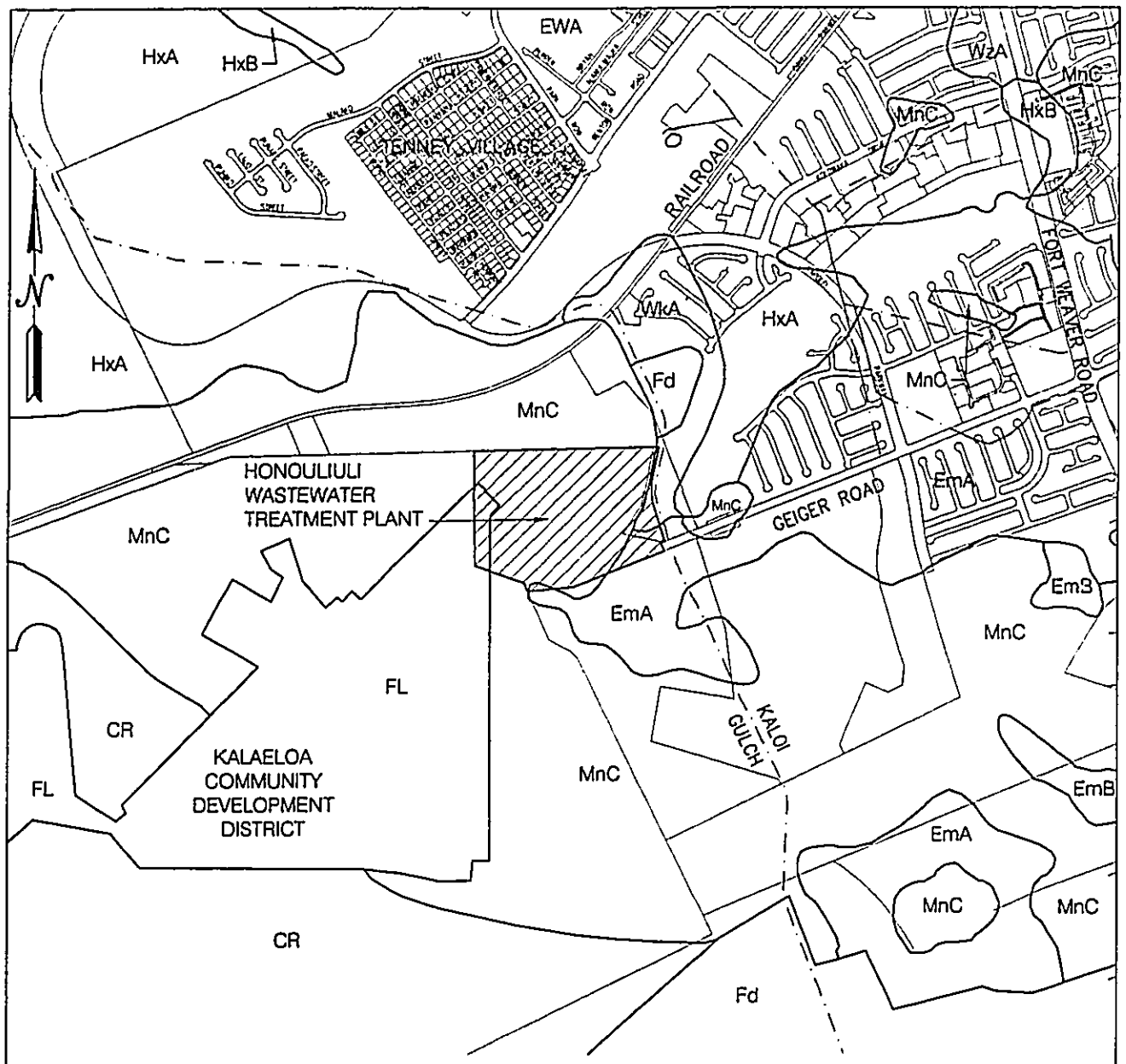
The Honouliuli WWTP site was formerly part of the Barbers Point NAS. In the late 1930s, the station was an auxiliary airfield for Ford Island. After the Pearl Harbor attack in 1942, the area was established as the Ewa Marine Corps Air Station. Later the Station was expanded to its present boundary and designated a Naval Air Station.

The City and County of Honolulu acquired the WWTP site from the Federal Government in 1974. At this time, the area had already been converted from an abandoned runway to a small day care center. An archaeological reconnaissance survey of the entire WWTP site was conducted in 1975. No sites were identified. The City and County of Honolulu graded and landscaped the property in 1979 in support of the newly constructed WWTP. No sinkholes have been identified at the site.

3.8 FLORA AND FAUNA

Ecological surveys of the Honouliuli WWTP and adjacent Barbers Point were documented by Conoco-Dillingham for the development of the Conoco Refinery at Barbers Point in the 1970's. A second fauna and avifauna survey was performed in 1996 (Funk) within the general area of the WWTP. Two field trips were conducted during March-May 2002 to observe current flora and fauna at the WWTP.

The predominant fauna inhabiting the area included the introduced mongoose, Hawaiian rat, house mice, brown rat, black rat and feral cats and dogs.



SOIL LEGEND

LOW INTENSITY

CR	Coral outcrop
FL	Fill land, mixed

HIGH AND MEDIUM INTENSITY

EmA	Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes
EmB	Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes
Fd	Fill Land
HxA	Honouliuli clay, 0 to 2 percent slopes
HxB	Honouliuli clay, 2 to 6 percent slopes
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes
WkA	Waialua silty clay, 0 to 3 percent slopes
WzA	Waipahu silty clay, 0 to 2 percent slopes

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Figure 3-5 USDA SOIL CONSERVATION SERVICE, SOIL SURVEY MAP

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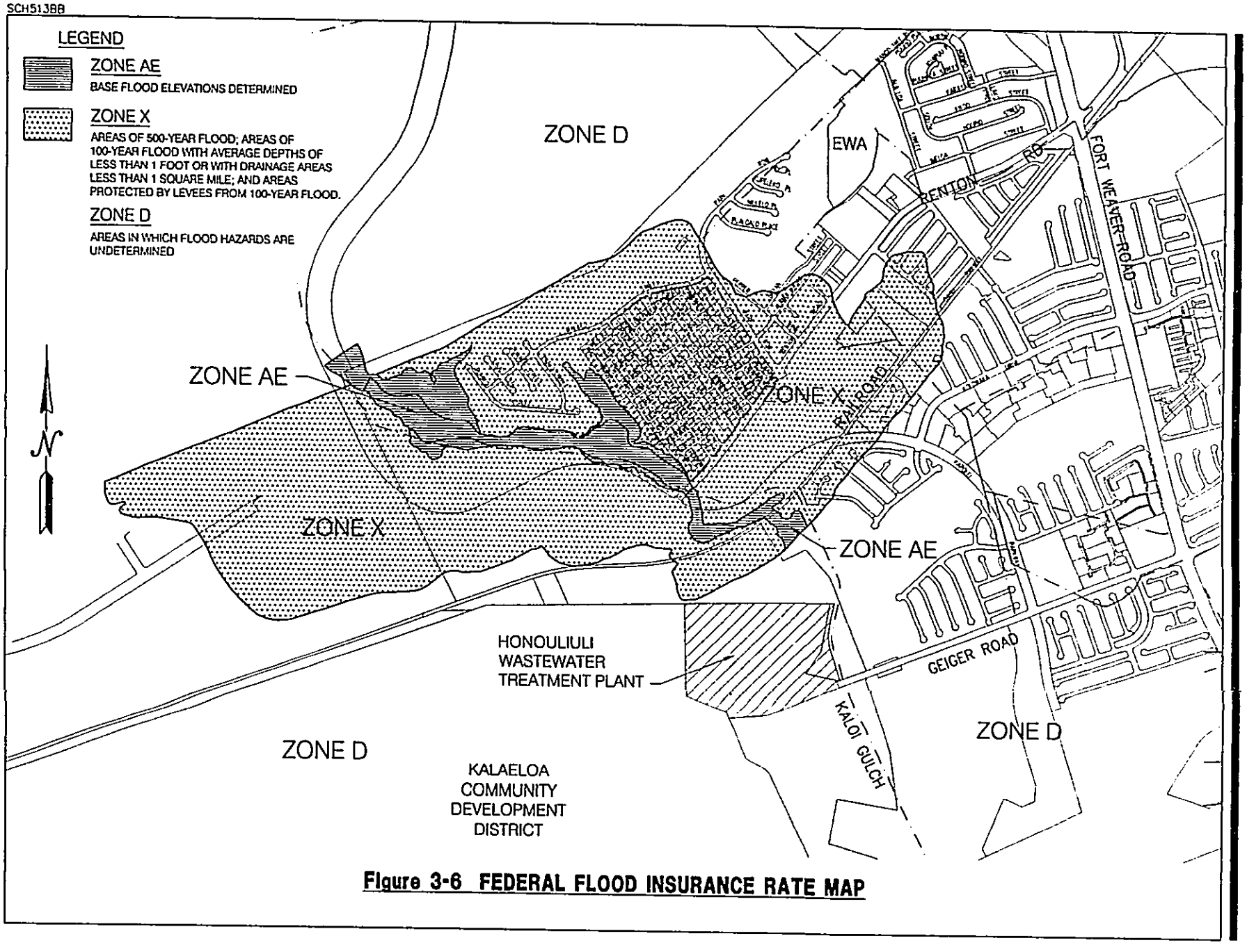


Figure 3-6 FEDERAL FLOOD INSURANCE RATE MAP

Several bird species were documented and include commonly found species, including Barred Dove, Spotted Dove, Japanese White-Eye, Brazilian Cardinal, American Cardinal, Golden Plover, and RiceBird.

Table 3.1 list birds found in the general regions as compiled from surveys conducted in conjunction with the Barbers Point deep draft harbor and proposed Ewa Beach Marina developments. These species are assumed to be present at the Honouliuli WWTP.

There are no threatened, rare or endangered animal species found within the project site and surrounding areas.

The Honouliuli WWTP site has been landscaped during the construction and life span of the plant. A double tier of trees was planted around the boundary of the property, while the interior areas were grassed or laid with gravel. Crotons were planted between buildings and walkways. Most of the existing monkey ponds were retained. The flora species found on site are listed in Table 3.2. There are no threatened, rare or endangered plant species found on or adjacent to the property.

3.9 UTILITIES

Water, electric and telephone utility facilities were installed at the site during the initial construction of the plant. Hawaiian Electric Company, HECO, is a public utility that provides Oahu homes and businesses with electricity. Kahe Power Plant located approximately 4 miles northwest of former NASBP, is the primary electric generating facility for the entire island.

Other power generating facilities include the privately owned Kalaeloa and AES plants and the City-owned H-POWER refuse-to-energy plant, all located in CIP. These facilities sell to HECO power that is distributed through a grid system consisting of overhead and underground power lines. The primary transmission line from Kahe Plant is 130 kilovolt (kV) overhead line to the Waiau substation in Pearl City, which serves the eastern portion of the island.

The City and County of Honolulu Board of Water Supply (BWS) is the local water utility agency on Oahu. The regional system is municipally owned, operated and maintained. BWS's regional potable water system consists of supply wells, storage reservoirs, booster pump stations, and transmission lines that carry water to distribution systems. This system services existing and planned developments in Makakilo, Kapolei, and Ewa. Potable water is supplied to the plant through a single 12-inch water line that runs along Geiger Road and connects to a city force main on Fort Weaver Road. Plant consumption of potable water averages 112,500 GPD. The plant also uses 2 MGD of R-1 from the Water Reclamation Facility that operates on site.

Verizon purchased GTE Hawaiian Tel and currently is the primary island wide telephone company. Their service in the Ewa region is provided via overhead lines that are shared under the joint pole agreement established with other utility systems.

TABLE 3.1
AVIFAUNA OBSERVED IN THE BARBERS POINT AREA

COMMON NAME	SCIENTIFIC NAME
American Golden Plover	*Pluvialis dominica fulva*
Brazilian Cardinal	*Paroaria coronata*
Barred Dove	*Geopelia striata*
Barn Owl	*Tyto alba*
Black-crowned Night Heron	*Nycticorax nycticorax hoactli*
Black-headed Munia	*Lonchura malacca*
Black-headed Mannikin	*Lonchura malacca atricapilla*
Cardinal	*Cardinalis cardianlis*
Cattle Egret	*Bulbucus ibis*
Englilsh Sparrow	*Passer domesticus*
Feral Pigeon	*Columba livia*
House Finch	*Carpodocus mexicanus*
Indian Mynah	*Acridotheres tristis*
Japanese White-eye	*Zosterops japonicus*
Lace Necked Dove	*Streptopelia chinensis*
Mockingbird	*Mimus polyglottos*
Orange-checked Waxbill	*Estrilda melpoda*
Pacific Golden Plover	*Pluvialis domininca fulva*
Peafowl	*Pavo cristatus*
Red-eared Waxbill	*Estrilda melpoda*
Red-vent Bulbul	*Pycnonotus cafer*
Ricebird	*Lonchura punctulata*
Ring-neck Pheasant	*Phasianus colchicus torquatus*
Ruddy Turnstone	*Arenaria interpres*
Rock Dove	*Columba livia*
Short-eared Owl	*Asio flammeus sandwichensis*
Spottted Dove	*Zencida chinensis*
Spotted Munia	*Lonchura punctulata*
Sanderling	*Calidris alba*
Shama Thrust	*Copsychus malabaricus*
Wandering Tattler	*Heteroscelus incanus*

TABLE 3.2
FLORA FOUND AT THE HONOULIULI WWTP SITE

COMMON NAME	SCIENTIFIC NAME
Bombax	*Bombax malabarica*
Buffalo Grass	*Stentophrum secondatum*
Cannon Ball	*Couroupita guianensis*
Crotons	*Codiaeum variegatum*
Earpods	*Enterolobium cyclocarpum*
Kapok	*Ceiba pentandra*
Monkey Pod	*Samanea saman*
Pak-lan	*Michelia alba*

3.10 SOCIO-ECONOMIC

Census 2000 recorded 1,211,537 population for the State of Hawaii. In addition, Hawaii receives approximately 7,000 visitors a day. The Honouliuli WWTP is located within the Ewa District of Oahu, which recorded a population of 228,340 (Census 2000). Table 3.3 summarizes the population for the Ewa District areas. The Ewa District covers an area of over 162 square miles, resulting in an average population density of 1,402 persons per square mile. Based on the Census 2000, the State of Hawaii has 188.6 persons per square mile, and the County of Honolulu has 1,460 persons per square mile.

TABLE 3.3
SUMMARY OF POPULATION FOR EWA DISTRICT

Geographic Area	Total Popn	Native Hawaiian	White	Black Amer.	Asian
Aiea CDP, Honolulu County	9,019	458	1,466	77	5,259
Barbers Point Housing CDP	67	2	59	0	4
Ewa Beach CDP, Honolulu County	14,650	1,556	1,633	96	7,199
Ewa Gentry CDP, Honolulu County	4,939	253	750	191	2,536
Ewa Villages CDP, Honolulu County	4,741	220	166	14	3,339
Halawa CDP, Honolulu County	13,891	1,449	2,153	254	7,070
Iroquois Point CDP, Honolulu County	2,462	22	1,891	137	102
Maili CDP, Honolulu County	5,943	1,420	658	54	1,341
Makakilo City CDP, Honolulu County	13,156	1,342	3,179	333	4,220
Mililani Town CDP, Honolulu County	28,608	1,303	5,829	879	13,426
Nanakuli CDP, Honolulu County	10,814	4,348	616	85	1,255
Pearl City CDP, Honolulu County	30,976	1,904	5,340	838	16,547
Village Park CDP, Honolulu County	9,625	729	901	216	5,573
Waimalu CDP, Honolulu County	29,371	1,655	5,017	684	16,248
Waipio CDP, Honolulu County	11,672	636	1,683	329	6,380
Waipio Acres CDP, Honolulu County	5,298	434	999	276	1,948
Waipahu CDP, Honolulu County	33,108	4,077	1,566	308	21,774
TOTAL	**228,340**	**21,808**	**33,906**	**4,771**	**114,221**
Percentage		9.6%	14.8%	2%	50%

Source: Census 2000

The resident population within the district is Asian, 50%, and Caucasian 15%. The Hawaiian population for this district is 10%. A majority of the district population is between the ages of 18 and 64, with slightly more males (51%) than females (49%). Housing units within the district are typically owner-occupied. The number of persons per household ranges between two and five.

Table 3.4 summarizes the actual and forecast key economic indicators for Hawaii from 2000 to 2005. Economic activity on Oahu is concentrated in the Primary Urban Center, Honolulu area, which has about three-quarters of island jobs and about half of the population. Projections to the year 2020 anticipate a decrease in job share in Honolulu to

TABLE 3.4
ACTUAL AND FORECAST KEY ECONOMIC INDICATORS FOR HAWAII 2000 TO 2005

Economic Indicators	2000 Actual	2001 Actual	2002 Forecast	2003 Forecast	2004 Forecast	2005 Forecast
Total population (thousands)	1,212.3	1,224.4	1,236.6	1,249.0	1,261.5	1,274.1
Visitor arrivals (thousands)	6,948.6	6,313.7	6,534.7	6,946.4	7,120.0	7,283.8
Visitor expenditures (million dollars)	10,918.1	10,140.0	10,486.4	11,282.0	11,761.1	12,263.5
Honolulu CPI-U (1982-84=100)	176.3	178.4	180.7	183.8	187.3	190.9
Personal income (million dollars)	33,763.2	34,960.9	35,951.1	37,258.4	38,711.5	40,182.5
Personal income*($1996 million)	32,690.7	33,451.9 p	33,962.0	34,604.0	35,282.4	35,939.5
Total wage & salary jobs (in thousands)	559.2	561.0	559.3	571.6	583.0	594.7
Gross state product (million dollars)	42,364.0	44,186.9 p	45,602.6	47,176.3	48,969.0	50,780.9
Real gross state product*($1996 million)	38,582.9	39,223.3 p	39,803.3	40,290.5	40,961.3	41,644.0
Gross state product deflator (1996=100)	109.8	112.7 p	114.6	117.1	119.5	121.9
Annual Percent Change						
Total population (thousands)	0.2	1.0	1.0	1.0	1.0	1.0
Visitor arrivals (thousands)	3.1	-9.1	3.5	6.3	2.5	2.3
Visitor expenditures (million dollars)	6.2	-7.1	3.4	7.6	4.2	4.3
Honolulu CPI-U (1982-84=100)	1.7	1.2	1.3	1.7	1.9	1.9
Personal income (million dollars)	4.1	3.5	2.8	3.6	3.9	3.8
Personal income ($1996 million)	2.3	2.3	1.5	1.9	2.0	1.9
Total wage & salary jobs (thousands)	3.0	0.3	-0.3	2.2	2.0	2.0
Gross state product (million dollars)	4.6	4.3 p	3.2	3.5	3.8	3.7
Real gross state product *($1996 million)	1.9	1.7 p	1.5	1.2	1.7	1.7
Gross state product deflator *(1996=100)	2.7	2.6 p	1.7	2.2	2.1	2.0

p Preliminary.
Source: Hawaii State Department of Business, Economic Development and Tourism, June 25, 2002.
*The values are expressed in 1996 dollars ($) (in millions)

approximately 69%. The job share in the Secondary Urban Center in the Ewa Development Plan (DP) area is expected to grow at a rate of 4% a year, going from 3 percent of island jobs in 1990 to 10 percent in 2020. The City of Kapolei is expected to become the major employment center for this region.

The state of the economy has been influenced by the extraordinary events of September 2001. Visitor arrivals declined 30% and unemployment increased in the fourth quarter of 2001, due largely to September 2001 events. During the first quarter of 2002, the decrease in visitor arrivals had been cut to 11%. Average daily visitor census numbers were down 8.8% in the first quarter of 2002. Hotel occupancy rates also dropped, decreasing from 80.5% in the first quarter of 2001 to 70.8 % in the first quarter of 2002.

Hawaii's civilian employment was the same in the first quarter of 2002 as was first quarter of 2001. The unemployment rate declined from 5.3% to 4.6% from the fourth quarter of 2001 to the first quarter of 2002. The numbers of non-agricultural wage and salary jobs were down 1.2% measured year to year for the first quarter.

Three industries accounted for most of the job losses between the first quarters of 2002 and 2001. Retail trade lost 4,450 jobs; transportation lost 3,950 jobs and hotel jobs down 2,650 jobs. These amounted to 3.8%, 12&, and 6.7% decreases respectively.

The outlook for the State's economy provides optimism for the future. Visitor arrivals continue to climb toward their previous (September 2001) level, civilian employment and jobs growth have stabilized, and construction has not been immobilized. Hawaii's recovery is expected to be a function of the recovery of its visitor markets and the US and international economic performance. In the absence of any new shocks to the confidence of travelers, Hawaii visitor counts are expected to continue to improve. In 2002, total visitor arrivals are predicted to grow 3.5 percent and visitor expenditures are forecast to increase 3.4 percent from their depressed state during 2001.

Total wage and salary jobs in the state are now expected to finish 2002 at 0.3% below the 2001 total. Visitor arrivals are anticipated to increase by 6.3% in 2003 and bring the total visitor count for the year back up to the year 2000 level. This will help the overall job count manage a 2.2% increase for 2003.

3.11 EXISTING AIR QUALITY

The US Environmental Protection Agency has promulgated National Ambient Air Quality Standards (NAAQS) for sulfur dioxide (SO_2), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), and ozone (O_3). These are commonly termed the "criteria pollutants", and information about their effects is included in Appendix A.

Two levels of protection are provided by the NAAQS. Primary NAAQS were set at levels to protect public health, while secondary NAAQS were established at levels designed to protect welfare, including agricultural crops, building materials, national parks and forests. The State of Hawaii has promulgated its own ambient air quality standards that were patterned after the NAAQS. The State Ambient Air Quality Standards (SAAQS) are more stringent than the NAAQS for three pollutants: NO_2, CO and O_3. The State of Hawaii also promulgated a 1-hour ambient standard for hydrogen sulfide (H_2S). Table 3.5 summarizes the State of Hawaii and Federal Ambient Air Quality Standards.

The island of Oahu has been designated by the USEPA as either meeting the NAAQS or being unclassified for SO_2, CO, NO_2 and O_3 (40 CFR Part 81.312). The State of Hawaii currently maintains and operates a network of nine National Air Monitoring Stations/ State and Local Air Monitoring Stations (NAMS/SLAMS) on the island of Oahu. The primary purpose of the NAMS/SLAMS data collection program is to measure background air quality.

Figure 3-6 shows the locations for the three sampling stations located on the Ewa Plain. The Kapolei site is closest to the Honouliuli WWTP. Table 3.6 summarizes the highest

short term and annual average pollutant concentrations measured at this monitoring station during the last five-year period. No exceedances of the NAAQS or SAAQS recorded at this station during this period.

In 1997, the Hazard Evaluation and Emergency Response (HEER) Office of Hawaii Department of Health investigated the health effects associated with elevated levels of the six criteria pollutants described in Appendix A. The levels of these substances measured by HEER were found to be typical of coastal urban areas of the United States, and did not indicate any potential short-term or long-term health hazards in this area.

An application for a covered source air permit was submitted to DOH in November 1995, amended May 1998 and expires January 2003. The covered source permit addresses all emissions from the WWTP, including emergency generators, diesel pumps, and odor control systems.

TABLE 3.5
SUMMARY OF STATE OF HAWAII AND
FEDERAL AMBIENT AIR QUALITY STANDARDS

	STANDARDS		
POLLUTANT	Hawaii State Standards	Federal Primary Standard[a] (Health)	Federal Secondary Standard[b] (Welfare)
CARBON MONOXIDE			
1 hour	10 mg/m^3	40 mg/m3	40 mg/m3
8 hour	5 mg/m^3	10 mg/m3	10 mg/m3
NITROGEN DIOXIDE			
1 hour	—	—	—
24 hour	----	----	----
Annual (Arithmetic)	70 ug/m^3	100 ug/m3	100 ug/m3
PM -10[c]			
24 hour	150 ug/m3	150 ug/m3	150 ug/m3
Annual (Arithmetic)	50 ug/m3	50 ug/m3	50 ug/m3
HYDROGEN SULFIDE			
1 hour	35 ug/m3	----	----
OZONE			
1 hour	100 ug/m3	235 ug/m3	235 ug/m3
SULFUR DIOXIDE			
3 hour	1300 ug/m3	-----	1300 ug/m3
24 hour	365 ug/m3	365 ug/m3	
Annual (Arithmetic)	80 ug/m3	80 ug/m3	-----
LEAD			
3 months	1.5 ug/m3	1.5 ug/m3	1.5 ug/m3
[a] Designated to prevent against adverse effects on public health			
[b] Designated to prevent against effects on public welfare, including			
effects on comfort, visibility, vegetation, animals, aesthetic values,			
and soiling and deterioration of materials			
[c] Particulate Matter which is co microns or less in diameter			

TABLE 3.6
BACKGROUND AIR QUALITY DATA – KAPOLEI MONITORING STATION

Pollutant	Averaging Time	1997 ug/m^3	1998 ug/m3	1999 ug/m3	2000 ug/m3	2001 ug/m3
Carbon Monoxide	8 hours	720	841	784	926	734
	1 hour	1,796	3,078	2,166	5,700	1,739
Nitrogen Dioxide	Annual	8	12	8	8	2
Sulfur Dioxide	Annual	2	3	2	2	2
	24 hours	20	19	17	17	14
	3 hours	61	62	57	57	45
Suspended PM_{10}	24 hours	42	60	78	78	52
	Annual	13	24	24	24	19

Presently the covered source permit (CSP 0215-01) allows for a 25 ppb (parts per billion) H_2S concentration (1-hour limit) at the property line. During the last four years the facility has experienced nine minor exceedences for the H_2S limit. Eight of these exceedences have been the result of equipment malfunctions at the facility, and have been corrected.

3.12 EXISTING NOISE QUALITY

Noise is generally defined as loud, unpleasant, unexpected or undesired sound that is typically associated with human activity and which interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human exposure response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual. Table 3.7 summarizes a range of typical noise levels.

Some land uses are considered sensitive to noise. Noise sensitive receptors are land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise. They often include residential dwellings, mobile homes, motels, hospitals, nursing homes, educational facilities and libraries.

The State of Hawaii has adopted standards to limit noise from stationary and construction noise sources (Hawaii Administrative Rules, Chapter 46).

Stationary Noise Source: The maximum permissible sound levels for stationary noise sources are summarized in Table 3.8. The applicable limits are a function of the zoning districts and the time of day. The sound levels are measured at any point at or beyond the property line of the noise source. The noise level shall not exceed the maximum permissible sound level for more than ten percent of the time within any twenty-minute period.

Construction Noise Sources: Construction activity is permitted between the hours of 7:00 am and 6:00 pm, Monday through Friday, and 9:00 am and 6:00 pm on Saturday. No specific sound level limit has been established for construction during the permitted hours.

Appendix B outlines Federal Standards (FAA Standards PAR 150) for land use compatibility with respect to day and night average sound levels. According to Table 1 in Appendix B, residential and public uses are compatible with noise levels under 65 dBA. The WWTP current zoning is residential and public facility. The current noise sources at the WWTP include vehicular traffic and equipment. *The Environmental Impact Statement for the Disposal and Reuse of Naval Air Station Barbers Point Hawaii* (1999) conducted a noise study for the proposed alternative of using the airfield as a reliever airport for the Honolulu International Airport. This study identified the WWTP as being located outside of the 55 dBA noise contour.

TABLE 3.7
SOUND LEVEL OF TYPICAL NOISE SOURCES AND NOISE ENVIRONMENTS
(A-weighted sound levels)

Noise Source	Scale of A-Weighted Sound Level in Decibels	Noise Environment	Human Judgment of Noise Threshold of Pain*
Military Jet Take off	140	Carrier Flight Deck	
Commercial Jet Take off	120	Airport	*32 times as loud
Pile Driver	110	Construction site	*16 times as loud
Rock Concert	110	Enclosed Arena	*16 times as loud
Ambulance (100ft)	100	Travel way	*8 times as loud
Power Lawn Mower (3ft)	100	Residential	*8 times as loud
Motorcycle (25 ft)	90	Residential	*4 times as loud
Diesel Truck, 40 mph (50 ft)	90	Residential	*4 times as loud
Garbage Disposal (3 ft)	80	Household	*2 times as loud
Living Room Stereo (15 ft)	70	Household	Moderate loudness
Vacuum Cleaner (3 ft)	70	Household	Moderate loudness
Normal Conversation	60	Business office	*half as loud
Light Traffic (100 ft)	50	Business office	*half as loud
Bird calls (distant)	40	lower limit of urban	quiet
Soft whisper (5 ft)	20	Quiet room	just audible

TABLE 3.8
MAXIMUM PERMISSIBLE SOUND LEVELS

Zoning District	Daytime 7am - 10 pm	Nighttime 10 pm - 7 am
Class A	55 dBA	45 dBA
Class B	60 dBA	50 dBA
Class C	70 dBA	70 dBA

Class A Zoning District - Includes all areas equivalent to lands zoned residential

Class B Zoning District - Includes all areas equivalent to lands zoned for multi- family dwellings, apartments, business, commercial, hotel, resort or similar type.

Class C Zoning District – Includes all areas equivalent to lands zoned agriculture, Country, industrial, or similar type.

3.13 TRAFFIC

H-1 Freeway is the major east-west corridor, with peak direction volumes of about 2,800 vehicles. Another east-west connector, Farrington Highway accommodates large volumes of traffic in the Kapolei area and farther west. Fort Weaver Road is one of the most heavily traveled north-south roadways through Ewa. It connects primarily residential communities in eastern Ewa to Farrington Highway and the H-1 Freeway. The WWTP is accessed off Geiger Road, which intersects with Fort Weaver Road. Near Fort Weaver Road, Geiger Road is four lanes, but it reduces to two lanes before passing the WWTP. The eastern leg of Geiger and Fort Weaver Roads is Iroquois Road.

Recent traffic (DOT April 1999) counts from the Department of Transportation show that approximately 44,000-48,000 vehicles enter the intersection of Fort Weaver Road and Geiger Road daily, most of these (30,000-38,500) pass through Fort Weaver Road. The daily vehicle count on Geiger Road is about 6,000-6,400. Peak hour traffic on Fort Weaver Road is about 2,800 vehicles in the morning and 2,500 vehicles in the afternoon. Corresponding peak hour traffic on Geiger Road is about 1,200 in the morning and about 1,000 in the afternoon.

SECTION 4
PROJECT IMPACTS AND MITIGATION MEASURES

SECTION FOUR

PROJECT IMPACTS AND MITIGATION MEASURES

4.1 SHORT TERM IMPACTS (CONSTRUCTION IMPACTS) AND MITIGATION MEASURES

Short-term impacts of the proposed anaerobic digesters, both convectional and egg-shaped, which may affect the project site and adjacent areas, are discussed in this section. Short-term impacts are generally associated with construction activities such as clearing, grading, excavating, building and landscaping. The short-term impacts are considered the same for either of the proposed alternative, convectional vs. egg shape digesters, unless otherwise described below.

The short-term impacts shall be limited to an estimated construction period. All construction activities will be contained within the plant property.

Anticipated impacts on noise levels, traffic, air quality, water quality, soils, public health and safety, flora/fauna, economic and archaeological/historical resources as a result of the proposed action and the appropriate Mitigative measures are described in this Section.

4.1.1 Operation of WWTP during Construction

The anaerobic sludge stabilization facility is expected to take five years to design, construction and place in service. During this interim period flows to the Honouliuli facility are expected to continue increasing with a concurrent increase in the amount of sludge being processed.

To mitigate the effect of increased plant loading over this interim period two process changes have been considered. The first involves the segregation of waste secondary sludge such that it can be dewatered without having to be stabilized. The second option considers the effect of thickening the primary sludge to greater content. Both options result in a reduction in the flow of sludge to the heat treatment unit. The first option requires physical modifications to the plant while the second requires only changes in operational practices.

The construction activities associated with conventional digesters or the ESD will be separated from plant operations by construction screens. No impact to plant operations during the construction of the digesters is anticipated.

4.1.2 Surface Water and Groundwater Quality

Construction of the proposed digesters and additional buildings should not affect water quality in the Ewa area. The project site is not contiguous to any potable groundwater resources, streams or oceans. Drainage and erosion control plans are required as part of the permit process. These plans shall verify that construction operations and runoff water generated by the project shall not have adverse impacts on local water quality.

Erosion control measures used to minimize runoff impacts may include: constructing berms around the construction site to contain runoff; covering or mixing soils with mulch to reduce runoff; perform clearing and grading operations during dry weather periods; and pave, landscape and/or seed area immediately after grading. The contractor will install a detention pond to collect sediment.

Construction activities for either digestion system are contained and will not restrict current operations; therefore, anticipated impact to the existing effluent from primary and secondary treatment that flows to the Barbers Point Ocean Outfall for final disposal are not expected.

4.1.3 Noise Quality

Noise levels at the site and adjacent area will increase during construction activities for either of the alternatives. Major sources of noise will originate from excavation and transport of equipment.

The project site is located well away from any residential areas. Construction activities will be restricted to normal daylight working hours. All equipment will be properly maintained by the Contractor and shall be outfitted with noise muffling devices. Heavy vehicles utilized for construction must be in compliance with Hawaii Administrative Rule (HAR) Title 11 Chapter 42, Vehicular Noise Control for Hawaii. The Contractor will be required to obtain a noise permit if noise levels commonly exceed standards specified under Title 11, Administrative Rules, and DOH, CH. 43.

4.1.4 Air Quality

The construction phase of the project is expected to have minimal effect on air quality. Fugitive dust and fumes may result from operations and exhaust emissions from equipment and vehicles during the construction phase. The Contractor will be responsible for minimizing dust generated in compliance with the State Department of Health's Public Health Regulations, HAR Title 11 Chapter 60, Air Pollution Control.

The Contractor will employ dust control methods in accordance with the contractor's dust control plan. Several Mitigative measures that may help prevent particulate matter from becoming airborne and travel off-site include: surrounding down-wind portions of the site

with dust screens; frequently spray bare, exposed soils with water; pave, landscape and/or seed areas immediately after grading; and, cover or mix exposed soils with mulch.

Burning of cleared vegetation should be limited or prohibited. All motorized construction equipment shall be in good mechanical condition and equipped with emissions controls that meet the Department of Environmental Quality Standards. Open bed trucks shall be covered when transporting materials likely to give off airborne particulates.

The existing emission permit will be applicable during the construction activities.

4.1.5 Flora and Fauna

There are no identified or known threatened, rare, or endangered species of flora or fauna inhabiting the project site. Flora and fauna have previously been displaced due to past construction and operation activities at the plant. Noise produced by the construction of the proposed project may temporarily displace some of the birds and rodents founds at the plant. Tables 3.1 and 3.2 list the birds and rodents found at the site. These animals will most likely re-establish themselves on the property once construction is complete. Anticipated adverse impacts to flora and fauna are not expected.

4.1.6 Archaeological/Historical

The project site has a history of past development. It is assumed that any site features of historic or archaeological value have been recovered or destroyed during these periods of development. Presently, no archaeological or historical resources are known to exist at the plant site.

Workers will be trained to recognize artifacts uncovered during construction. Should artifacts be discovered at the project site, they shall be clearly marked and preserved. The Developer and/or Contractor shall immediately contact the State Historic Preservation Division to negotiate the appropriate course of action to be taken, such preservation, protection, restoration and/or relocation.

4.1.7 Construction Waste

The Contractor shall be required to submit a solid/liquid waste management plans to the Department of Environmental Services for approval. The site shall be equipped with portable self-contained latrine facilities. Suitable vegetable shall be chipped and used as mulch. Unusable waste will be disposed of in an approved off-site landfill.

4.1.8 Traffic

The construction phase for the proposed project is not anticipated to have a significant adverse impact on the local traffic. The Honouliuli WWTP is located on Geiger Road off of Fort Weaver Road (Route 760). Geiger Road also provides access to Kaahupahau, a small residential development area. Traffic along both sides is light to moderate.

Mobilization of construction equipment and materials shall be conducted during light traffic periods. Work shifts may also be scheduled to coincide with light traffic periods. Construction vehicles should be required to be inspected, for example. tire safety and efficient lighting, so that no damage would be a result from poor maintenance.

4.1.9 Public Health and Safety

The Contractor shall be responsible for implementing appropriate measures to ensure public safety and health during the construction period. Construction areas will be delineated with no-trespassing and safety signs. The WWTP's existing protocol for Standard Occupational Safety and Health Administration (OSHA) requirements, which include safety glasses and hard hats at a minimal, will be maintained.

4.1.10 Short Term Economic Impacts

Construction of the proposed digesters and additional support structures will provide related jobs for local workers. Local material suppliers and retail businesses are expected to generate revenues by the project. These activities are anticipated to have a positive economic impact on the local economy.

4.2 LONG TERM IMPACTS AND MITIGATIVE MEASURES

The anticipated long-term impacts associated with the operation of proposed digesters and support structures are confined to the immediate site and to the area's existing infrastructure. The following sections describe the project's long-term impacts on the criteria reviewed in Section 3 and Section 4.1.

The long-term impacts are considered the same for either of the proposed alternative, convectional vs. egg shape digesters, unless otherwise described below.

4.2.1 Surface Water and Ground Water

There will be an increased amount of paved areas and impervious surfaces, ie: conventional digester covers. Due to the configuration, the anticipated storm water run-off from the conventional digester would be greater than for the ESD. All storm water run-off will be contained on-site and recharged to groundwater with a ponding basin.

The plant effluent that is discharged to the Barbers Point Ocean outfall is expected to improve with the implementation of the anaerobic digestion process. The centrate from mesophilic anaerobic digestion process is significantly lower in soluble BOD (biological oxygen demand) compared to the supernatant and subsequent centrate produced by the heat treatment process. The latter process also adds soluble color to the supernatant and centrate. The Honouliuli WWTP primary process is well equipped to remove any additional suspended solids generated by the anaerobic design process, however it is unable to remove soluble BOD and color. Also less centrate is generated and recycled to the plant headworks, the effluent quality should improve. This positive impact results from the reduction in flow, soluble BOD concentration in the centrate that is recycled to the headworks of the plant.

4.2.2 Noise Quality

Once operational, the project facilities will have stationary noise sources similar to the existing noise generated from the WWTP. Each system of anaerobic digestion is contained. The conventional digester is capped with a floatable cover, and the ESD is one, enclosed structure. Both types of designs support the ability for each type of digester to resign from creating an increase in noise.

In addition, the support facilities including the water boiler, emergency waste gas flare, biogas sulfide removal equipment, odor control equipment and engine generator, are activities that are not anticipated to create additional adverse or significant noise. These sources will be selected, designed and operated in such a manner as to comply with the Hawaii Administrative Rules. There are no anticipated adverse impacts associated with the generation of noise from the stationary equipment.

4.2.3 Air Quality

Gas production is related to the anaerobic digestion process. The amount of gas production is a function of temperature, solids retention time and volatile solids loading. The two main constituents of digester gas are methane and carbon dioxide. Trace amounts of nitrogen, hydrogen, and hydrogen sulfide are also produced. The control of gas release will assist in odor control since hydrogen sulfide and gaseous ammonia are the main odor causing by products of anaerobic digestion

The gases produced by the digester are prevented from escaping the system and entering the environment through mitigation measures implemented. The measures to absorb the gases at the plant will employ the method of adsorption of the gases into a treated media with is landfill approved. The process involves the digester gases being absorbed into a solid media and then bound. The media is then transported to the land filled for disposal.

Currently HAR Title 11 Chapter 60, Air Pollution Control outlines the covered source air emissions permit. The existing plant permit may have to be amended to accommodate the addition of two hot water boilers, emergency waste gas flare, biogas sulfide removal

equipment, odor control equipment and engine generator. The removal of two large steam boilers and possibly the sludge incinerator will be addressed in the amendment of the existing permit.

The engine generator that will be installed at the facility will have an approximate power rating of 1200-1400 horse power (hp). The possible emissions associated with the implementation of the generator include Nitrogen Dioxide (NO_x), Sulfur Dioxide (SO_x), Carbon Dioxide (CO_2), and Particle Matter (PM_{10}). The generator will be equipped with equipment that will decrease the hydrogen sulfur concentration from 1500 ppmv to approximately 200 ppmv, also the generator will utilize a fuel resource that contains a low concentration of sulfur, which is approximately <0.02%. The emissions from NO_x, CO_2, and the PM_{10} will be neglibible due to emission controls implemented within the generator.

The emissions from the gas digester shall be considered fugitive, due in part to the fact that any gases produced will go to a two-stage scrubber system currently utilized at the facility. The digester design is also a conventional one, in which the ESD is totally enclosed and sealed, which shall prevent any releases of the gases.

With the installation of the standby hot water boilers and the emergency waste gas flare, the emissions are expected to be negligible. This is due in part to the fact that the boilers and the flare will operate only on a need basis when the generator is off-line.

With the installation and implementation of the new equipment the facility will be able to generate about 945 KW of energy on a daily basis. This is due in part to the distributed energy system, which includes the biogas fuel as a renewable energy resource. This will enable the plant to relive HECO from providing about one megawatt on a continuous daily basis.

The City and County of Honolulu will determine the best type of odor control system for Honouliuli WWTP for the final engineering design. In addition, odor control mechanisms, employed through scrubbers and various design criteria, will be determined in the *Final* EA. The *Final* EA will describe which system is best employed with considerations given to environmental sustainability, capitol costs, and maintenance and operation costs. The *Final* EA will conclude the final impacts anticipated to air quality.

4.2.4 Flora and Fauna

There are no known existing native, rare or endangered plant or animal species at the project site. Vegetation removed by construction activities will be replaced by landscaping of grasses and adaptable shrubs and trees. Maintenance of grass and landscaped vegetation will be the responsibility of the WWTP maintenance.

4.2.5 Socio-economic

The sludge stabilization process of anaerobic digestion (conventional digesters or ESD) will have several major benefits for the socio-economic environment. Firstly, it will help prolong the life of the City's remaining landfill be reducing the amount of materials for final landfill disposal. Considering the limited capacity of the City's existing landfills and the difficulty and expense of siting new landfills on O'ahu, the alternative of converting the sludge into a useful marketable product is in the public's best interest and creates a positive impact.

The second beneficial impact is that the sludge will be converted from a waste to a resource, known as "biosolids". Additional benefits include the ability for southwestern Oahu to accommodate the anticipated population growth and development.

4.2.6 Public Health and Safety

Gas collection is incorporated into each digester (conventional vs egg shape) design. Digester gas contains methane and carbon dioxide and displaces air, causing possible asphyxiation from a lack of oxygen. To monitor combustibles (hydrogen sulfide) and oxygen deficiency, the digester facility will be equipped with gas analyzers and detectors. In addition, each site should be provided with on-site emergency oxygen tanks.

All maintenance operations are conducted following Federal safety guidelines. The proposed facilities will be equipped (at a minimum) with fire protection, guardrails, eyewash stations, and adequate ventilation. Safety signs and overhead lighting will be installed to help assist personnel.

Storage of small volumes of liquids and potentially hazardous materials (ie: batteries, fuel, grease, degreasers, paints, solvents) will be stored in dry and secure locations. All major accidents or spills will be immediately reported to the appropriate government agencies.

4.2.7 Land Use and Planned Development

The proposed project will be funded through the City and County of Honolulu, Capital Improvement Fund and Sewer fund. The City Charter requires that public facility improvements be consistent and supportive of City land use policies and local development plans. The availability of reliable wastewater facilities is crucial for industrial, commercial and urban development in the Honouliuli wastewater tributary area.

The proposed anaerobic digestion process and support facilities that will accommodate the anticipated growth are crucial for Leeward wastewater system. Without these support

facilities, operations at the WWTP may be impaired adversely affecting public safety and system performance and reliability.

4.2.8 Visual Impacts

Visual impacts will differ for the conventional digester and the egg shape digester because of the different design and shape. The conventional digesters are not anticipated to create adverse visual impacts because they will compliment the existing facilities in shape and design. Three conventional digesters are being proposed with each measuring 90 ft. in diameter and 35 ft. in height. The diameter of 90 ft. for each conventional digester is comparable to the existing diameter of the four clarifiers. The visual impact created by the conventional digesters is not adverse.

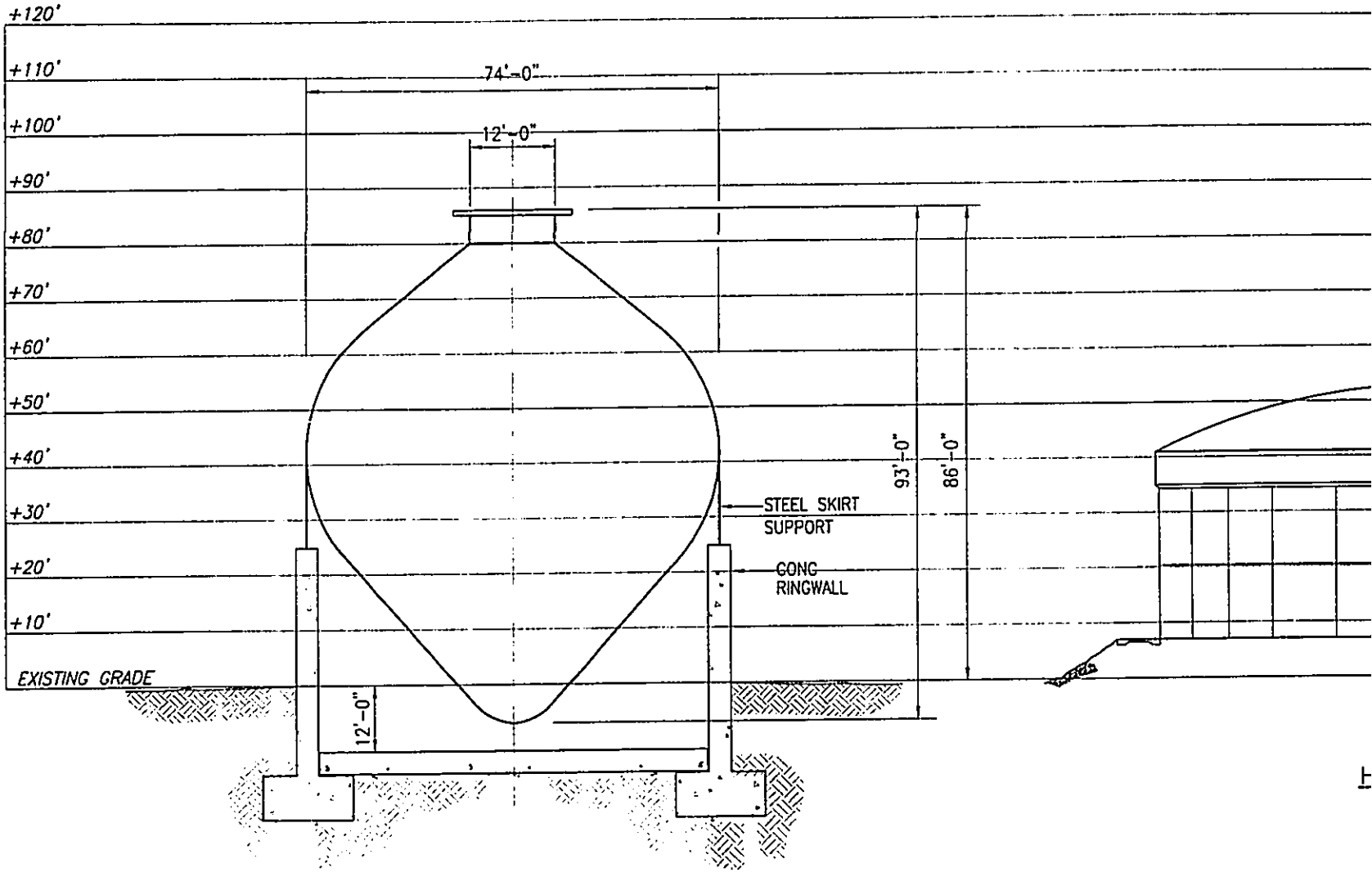
The two proposed ESDs are designed at a height 93 ft. with a major diameter of 74 ft. Each digester will be built so that 7 ft. will be placed below the existing grade. This will result in the final height for each ESD at 86 ft. Figure 4-1 shows the elevation view of the ESD compared to the existing structures, a biotower at 55 ft. and the solids handling building at 70ft. The difference of the proposed ESD, 86 ft., from the 70 ft. solids handling building is 16 ft. The visual impact created by the ESD, 16 ft. more than an existing structure, is not anticipated to be a significant adverse impact.

Possible mitigation measures for diverting attention from the potential visual impact of the ESD would be to landscape the site with suitable vegetation, for example: tall palm trees species or pine trees found locally.

4.2.9 Long Term Maintenance Cost Comparison

The only significant difference between the operating costs for conventional versus ESD digesters is the recommended frequency for dewatering, repair, and cleaning of the tanks. The frequency recommended for the former is every five years while the latter is ten years. The present day cost of this operation is $180,000 for the size of tanks selected for the Honouliuli WWTP. Seven operations would be carried on the conventional digesters over a twenty-year period while three for ESD's. The total savings in life cycle costs with the ESD is $987,210 when using an annual escalation factor of 3%.

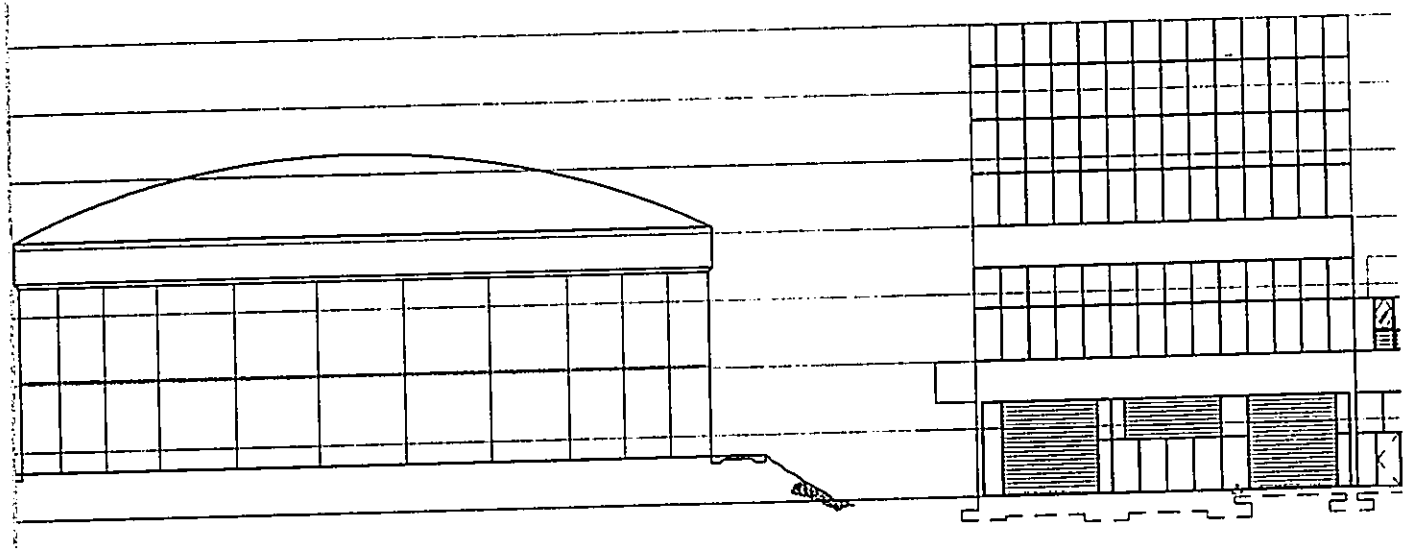
A gasholder and sludge storage tank is required with the ESD system because the digester is a constant volume reactor with insignificant gas storage capacity. Conversely, the floating roof supplied with the conventional digester provides both sludge and gas storage. These two additional tanks plus the ESD vessel increase the construction cost by $3,777,325. A present worth analysis in which maintenance cost are escalated at 3% per annum and discounted at 8% shows that the potential savings with the ESD system are negated by the initial capital cost. The conventional digester system has a net present worth of $29,203,410 versus $33,586,200 for the ESD system.



EGG SHAPED DIGESTER VESSEL

SCH513BK

Figure 4-1 ELEVATION VIEW OF 1.6 MGAL EGG SHAPED DIGESTER



SHAPED DIGESTER WITH PLANT STRUCTURES

SECTION 5
THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USE OF THE ENVIRONMENT AND THE MAINTANCE AND ENCHANCEMENT OF LONG TERM PRODUCTIVITY

SECTION FIVE

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

5.1 SHORT TERM USES

In the short term, the construction of the project is expected to generate a small amount of dust and noise from clearing and grading operations, as well as from building construction. Dust and noise levels will be controlled through appropriate site watering, dust fences, and exhaust mufflers and filters on heavy equipment.

The short-term benefits include increased job opportunities, and economic activity due to construction expenditures related to the project.

5.2 LONG TERM PRODUCTVITY

Long-term productivity from the proposed actions at the Honouliuli WWTP includes, the diversion of waste from the current landfill and assist in extending the landfill's lifespan. Co-generation, re-using energy for plant operations, will reduce the dependence on outside power sources. The process of anaerobic digestion for sludge stabilization and its ability to produce biosolids will conform to recent USEPA programs to promote beneficial reuse of sludge.

In addition, the proposed action of meets the needs of the expected growth for west O'ahu. Long-term productivity for local economies, urban and business planning and environmental sustainability would be deterred without the ability of Honouliuli WWTP to increase their ability of sludge stabilization.

Any long-term impacts of the facility are anticipated to be minimal and non-significant. The WWTP will maintain operations consistent with the current standards of their National Pollutant Discharge Elimination System (NPDES) permit held with USEPA and continue to comply with all County, State and Federal regulations relating to maintaining the ambient quality of all affected airsheds, surface waters, and groundwater.

SECTION 6
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

SECTION SIX

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project requires the commitment of open space located within the existing property of City and County's Honouliuli WWTP. The construction of the facilities involves the irreversible and irretrievable uses of energy, labor, materials, and capital.

A commitment to the use of resources includes, fuel oils for operation of construction equipment, transportation of materials to and from the site and operation of the digester (conventions vs. egg shaped) equipment.

SECTION 7
NOTICE OF DETERMINATION FOR DRAFT ENVIRONMENTAL ASSESSMENT

SECTION SEVEN

NOTICE OF DETERMINATION FOR FINAL ENVIRONMENTAL ASSESSMENT

As applicant for this Agency action, the City and Country of Honolulu Department of Design and Construction has applied the requirements of Chapter 343, Hawaii Revised Statutes (HAR), and the necessary significance criteria of Section 11-200-12 of Title 11 Chapter 200 and has determined that the proposed project will not have significant adverse impacts on the immediate or surrounding environment including air quality, water quality, noise, wildlife habitats, archaeological sites, or existing utilities. Any anticipated impacts will be encountered during the construction phase and will only be temporary and will not adversely impact the immediate and surrounding area. The following thirteen significant criteria are evaluated below:

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources**

   The proposed project will not involve the loss or destruction on any natural or cultural resources. There are no threatened, rare or endangered animal species found within the project site and surrounding areas. There are no findings of archaeological or historical sites in or around the area. The proposed project will be located within the area of the existing wastewater treatment facility, which was constructed in 1979.

2. **Curtails the range of beneficial uses of the environment**

   The proposed project is located within the existing wastewater treatment plant facility. The proposed project is consistent with the facility's current function and therefore will not curtail the range of beneficial uses of the environment.

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

   The proposed project is consistent with the environmental policies, goals and guidelines addressed in Chapter 344, HRS.

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

   The proposed project is expected to improve the stability and future development of the wastewater treatment service area by providing basic public works infrastructure necessary to the health, welfare and present and future growth of the community.

5. Substantially affects the public health

The proposed project will be constructed in compliance with the Federal, State and City and County of Honolulu regulations in regards to public health and safety. The short-term impacts anticipated during the construction phase of the project with regards to air quality, water quality, noise and traffic, have been addressed in this EA document and all necessary and appropriate mitigation measures will be implemented.

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

The proposed project is required to meet the growth expectations for leeward O'ahu through the year 2020. The proposed project will increase the capacity and improve operations at the existing facility, which is consistent with the City and County's General Plan objectives and policies for leeward Oahu.

7. Involves substantial degradation of environmental quality

The proposed project will be designed and constructed in accordance with all Federal, State and City and County polices, including the policies of Chapter 343, HRS. The proposed project is expected to enhance the surrounding environmental quality by creating a beneficial use product and diverting the waste product from the landfill. The project is anticipated, to improve the environmental quality of the surrounding areas.

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

The proposed project is expected to satisfy the increased demand in the area through the year 2020. The project is consistent with the current City and County's General Plan for the area. The improvements to the facility as a result of the proposed project are anticipated to enhance the treatment of wastewater in the area. With the implementation of appropriate mitigations measures for the proposed project, the potential for considerable effects on the environment is not expected. A commitment for larger actions is not foreseen.

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

There is no threatened, rare or endangered flora, fauna or animal species found within the project site or the surrounding areas.

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

All possible anticipated short term impacts to air quality, water quality or noise levels most likely due to occur during the construction phase will be mitigated through the appropriate measures and Best Management Practices (BMPs) illustrated in this EA document. Over the long term, air quality in the immediate vicinity of the project is expected to improve with cleaner technology replacing older equipment. Similarly, water quality at the ocean outfall will be enhanced by improved effluent quality resulting from the implementation of the project. The ambient noise levels are expected to remain unchanged.

11. 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 costal waters

The proposed project will be constructed within the existing facility footprint, which is not located in an environmentally sensitive area.

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

The proposed project is approximately two and a half miles southeast from the federal highway corridor (H-1). The view from the highway to the project site is shielded by the current residential development. According to the City and County Ewa General Plan Exhibit 3.2, the proposed project does not substantially affect any scenic vistas an/or view planes identified in county state plans or studies.

The visual impacts will differ for the conventional digester and the egg shape digester because of the different design and shape. The conventional digesters are not anticipated to create adverse visual impacts given that they will compliment the existing facilities in shape and design. Three conventional digesters are being proposed with each measuring 90 ft. in diameter and 35 ft. in height. The diameter of 90 ft. for each conventional digester is comparable to the existing diameter of the four clarifiers. The visual impact created by the conventional digesters is not adverse.

The two proposed Egg Shaped Digesters (ESDs) are designed at a height of 93 ft. with a major diameter of 74 ft. Each digester will be built so that 7 ft. will be placed below the existing grade. This will result in the final height for each ESD at 86 ft. Figure 4-1 shows the elevation view of the ESD compared to the existing structures, a biotower at 55 ft. and the solids handling building at 70ft. The difference of the proposed ESD, 86 ft., from the 70 ft. solids handling building is 16 ft. The visual impact created by the ESD, 16 ft. more than an existing structure is not anticipated to be a significant adverse impact.

Possible mitigation measures for diverting attention from the potential visual impact of the ESD would be to landscape the site with suitable vegetation, for example: tall palm trees species or pine trees found locally

13. Requires substantial energy consumption

The proposed project will not require any additional energy consumption. The project design calls for the replacement of the existing heat treatment process with anaerobic digestion, which provides a double benefit in energy savings. First, the latter process is less energy intensive and power demand is reduced to 57% of the existing process. Second, anaerobic digestion together with co-generation is a net energy producer. The combustion of biogas can produce 945kw of electricity. Five hundred (500) KW will be consumed by the solids stream for the gravity thickening operation to sludge dewatering. The remaining 445kw can be used to power the major load center operating the secondary treatment process.

The City and Country of Honolulu Department of Design and Construction has applied the necessary *significance criteria* of Title 11 Chapter 200-12 HAR and has determined that the proposed action will not have a significant effect on the immediate or surrounding environment and an Environmental Impact Statement (EIS) will not be required. Therefore, based upon the Final Environmental Assessment document and the evaluation of determination, it is recommended that a Finding of No Significant Impact (FONSI) be applied to this project.

SECTION 8
LIST OF NECESSARY PERMITS AND APPROVALS

SECTION EIGHT

LIST OF NECESSARY PERMITS AND APPROVALS

In addition to the approval of this Environmental Assessment, the following permits and approvals are required for the development of the proposed anaerobic digestion system.

STATE OF HAWAII

- Operating Permit (HAR Title 11: per subchapter 1 Chapter 58.1 Solid Waste Management Control) due to the bioconversion process producing methane.
- Air Quality Permit (Amendment of existing Air Permit to accommodate the addition of support facilities and the removal of obsolete equipment).
- NPDES Notice of Intent (NOI) Form C-Construction Storm Water Discharges
- NPDES Notice of Intent (NOI) Form G-Discharges Involving Construction Dewatering
- Construction Plan Review and Approval

CITY AND COUNTY OF HONOLULU

- Construction Plan Review and Approval
- Building Permit
- Height Variance Waiver Permit for Digester and Storage Tank
- Grading, Grubbing and Stockpiling Permit

SECTION 9
AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTATED IN THE PREPARATION OF THE EA

SECTION NINE

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED IN THE PREPARATION OF EA

The following agencies were consulted in the review of the Draft Environmental Assessment for the Honouliuli WWTP New Solids Handling Facility EA. All of the comments that are received were addressed in the appropriate sections of the Final Environmental Assessment. Copies of the agencies comments are included in the following section.

State Agencies

Department of Health
Environmental Management Division
Solid and Hazardous Waste Branch
Mr. Steve Chang
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

Department of Health
Environmental Management Division
Wastewater Branch
Dennis Tulang
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

Department of Health
Environmental Management Division
Clean Water Branch
Dennis Lau
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

Department of Land and Natural Resources
Division of Water Resource Management
Kalanimoku Building
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

Hawaii Community Development Authority
Sharyon Miyashiro, Ex. Director
677 Ala Moana Blvd., Suite 1001
Honolulu, Hawaii 96814

Land Use Commission
State Office Tower
235 South Beretania Street, 4th Floor
Honolulu, Hawaii 96804

Office of Environmental Quality Control
235 South. Beretania Street, Room 702
Honolulu, Hawaii 96813

State Historic Preservation Office
601 Kamokila Blvd.,Room 555
Kapolei, HI 96707

Department of Land and Natural Resources
Office of Conservation and Environmental Affairs
Kalanimoku Building
1151 Punchbowl Street, Room 131
Honolulu, Hawaii 96813

Waipahu Public Library
94-275 Mokuola Street
Waipahu, Hawaii 96797

City and County of Honolulu Agencies

Department of Planning and Permitting
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

Department of Environmental Services
650 S. King Street, 14th Floor
Honolulu, Hawaii 96813

Board of Water Supply
630 S. Beretania
Honolulu, Hawaii

Department of Parks and Recreation
94-230 Paiwa Street
Waipahu, Hawaii 96797

Councilman Mike Gabbard
City and County of Honolulu
530 South King Street, 2nd Floor
Honolulu, HI 96813

Federal Agencies

Department of the Army
U.S. Army Engineer District, Honolulu
808 438-9862

Department of the Interior
Fish and Wildlife Services
330 Ala Moana Blvd
Honolulu, Hawaii

Natural Resources
Hawaii District Office
677 Ala Moana Blvd Ste 415
Honolulu, Hawaii

Department of Agriculture
Natural Resources Soil Conservation Service
Rural Development
99-193 Aiea Hts. Dr. Ste 156
Aiea, Hawaii

Environmental Protection Agency-Region 9
300 Ala Moana Blvd. Rm 1302
Honolulu, Hawaii 96850

US Navy
Navy Public Works Center
4300 Radford Drive
Pearl Harbor, Hawaii

Individuals/Organizations

Hawaiian Electric Co.
Scott Seu, Env. Manager
P.O. Box 2750
Honolulu, Hawaii 96840

James Campbell Estate
1001 Kamokela Blvd.
Honolulu, Hawaii
674-6674

Ewa Neighborhood Board
91-092 Parish Dr.
Ewa Beach, HI 96706

Ms. Debra Luning
Director of Governmental Relations and Community Affairs
Gentry Homes Planning Department
560 North Nimitz Hwy
Suite 300
Honolulu, HI 96817

SECTION 10
EA COMMENTS AND RESPONSES

SECTION TEN

EA COMMENTS AND RESPONSES RECEIVED DURING THE 30-DAY COMMENT PERIOD

SAMPLE REQUEST FOR REVIEW LETTER

HAWAII, INC.

Engineers/Architects

November 4, 2002

Mr. Dennis Lau
Department of Health
Environmental Management Divisi >r
Clean Water Branch
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

RE: Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

Dear Sir,

On behalf of the City and County of Honolulu Department of Design and Construction, GMP Hawaii, is conducting an Environmental Assessment (EA) for the Honouliuli WWTP New Solids Handling Facility. GMP is initiating consultation with concerned agencies and request that your department review the project summary.

Project Summary

The Honouliuli WWTP has successfully used heat treatment for sludge stabilization since the facility went into service in 1984. Currently, the plant treats an average daily wastewater flow of 26.8 million gallons per day (mgd). The plant's future loading is estimated to be 42.0 mgd. The plant must expand the capacity of the sludge stabilization system unit process to satisfy the increased demand through year 2020. The plant has the option to expand heat treatment or consider another stabilization technology.

The City and County of Honolulu has selected anaerobic digestion for sludge stabilization with a combination of beneficial uses for dewatered sludge as the preferred alternative. This decision is attributed in part to replacing obsolete heat treatment equipment with a more energy efficient and environmentally benign process.

The project will include the addition of:

- Three digesters (conventional or egg shaped);
- Two new two-stage odor scrubbers;
- Replacement of the dewatering centrifuges;

1100 Alakea Street • Suite 1800 • Honolulu, Hawaii 96813-2833 • Telephone: (808) 521-4711 • Fax:(808) 538-3269

HAWAII, INC.
Engineers/Architects

Conclusion

The proposed project is anticipated to have no adverse or significant impacts to the operation of the Honouliuli WWTP or the surrounding environment. Impacts to air and noise quality will be short term during construction activities. The proposed project will support the current and predicated increase in the plant's treatment capacity. Based on the investigation performed for the draft EA, a determination of a Finding of No Significant Impact (FONSI) is expected.

We welcome your concerns or comments. If you require additional information please feel free to contact our office, and if the Department has any concerns and/or comments that may be applicable to the EA, please feel free to forward them to our office to my attention.

Sincerely,

Peter B. Melnyk, P.E., PhD
Vice President

Enclosures

1100 Alakea Street • Suite 1800 • Honolulu, Hawaii 96813-2833 • Telephone: (808) 521-4711 • Fax:(808) 538-3269

INCOMING COMMENTS AND RESPONSES

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
Acting DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

'02 DEC 26 AM 11

2002/ELOG-3351 (TH)

December 26, 2002

Mr. Peter B. Melnyk, P.E., PhD
Vice President
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Mr. Melnyk:

Draft Environmental Assessment (DEA) for the Honouliuli
Wastewater Treatment Plant (WWTP) New Solids Handling Facilities
Ewa, Hawaii, Tax Map Key: 9-1-013: 007 and 9-1-069: 004

We have reviewed the subject DEA and offer the following comments:

1. Section 3.4 (page 3-11) of the DEA briefly describes the city's General Plan and how the proposed project supports the General Plan. The proposed project also supports the following objectives and policies regarding Transportation and Utilities. We recommend that the final EA be revised to reference the objectives and policies cited below regarding Transportation and Utilities.

   V. Transportation and Utilities:

   Objective B: "To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal."

   Policy 5: "Provide safe, efficient, and environmentally sensitive waste-collection and waste disposal services."

2. The proposed project is consistent with the Ewa Development Plan (DP) and its long-range vision. Expansion of the Honouliuli WWTP is needed to accommodate increased growth and development in Ewa through the year 2020. Section 3.7.3.1 of the Ewa DP states that the Honouliuli Industrial Area should be used primarily for wastewater treatment, and that the Honouliuli WWTP should be expanded to accommodate additional growth and higher levels of treatment. The general location of the Honouliuli WWTP is designated for industrial use on the Ewa DP Urban Land Use Map, which is appropriate for its current use. A

wastewater treatment plant symbol is shown on the Ewa DP Public Facilities Map, which appropriately depicts the facility's current use.

3. The Ewa PIM already shows a Sewage Treatment Plant/Modification (STP/M) symbol (PIM symbol No. 002) on the site. This symbol will permit funds to be appropriated for construction of the proposed expansion of the sludge stabilization system unit.

4. The project site is currently zoned R-5 Residential District. The height limit ranges from 25 to 30 feet. We recommend that the elevation or section drawings of the proposed structures, which also show the existing and finish grades, be included in the final EA's "List of Figures." Additionally, the size and height of the structures should be described in the appropriate section(s) of the final EA.

   A waiver will be required for any new structure or equipment more than 25 and/or 30 feet high. The Honouliuli WWTP is a "public use and structure" for the purpose of the Land Use Ordinance. As such, it is eligible for a waiver from the development standards of the underlying zoning district, including height.

5. In Section 3.6 "Drainage," the final EA should discuss the existing and proposed drainage conditions in and around the project site. This section should also include proposed mitigation measures to minimize or prevent potential adverse impacts to city and private property as a result of the proposed project.

   We recommend that Section 8 "List of Necessary Permits and Approvals" be revised in the final EA to identify the relevant government agency responsible for granting all the necessary permits for the proposed project.

Thank you for the opportunity to comment on this matter. Should you have any questions, please call Tim Hata of our staff at 527-6070.

Sincerely yours,

ERIC G. CRISPIN, AIA
Acting Director of Planning and Permitting

EGC:js

cc: Department of Design and Construction
Office of Environmental Quality Control
g:/Planning/Div Function/ea-eis/2002/elog3351.doc

HAWAII, INC.

Engineers/Architects

March 17, 2003

Mr. Eric Crispin
City and County of Honolulu
Department of Planning and Permitting
650 S. King Street.
Honolulu, Hawaii 96813

RE: Comments Submitted Regarding the Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

The following is the response to the comments submitted:

Item 1:

Complied. Incorporated the comment in the appropriate section.

Item 2, 3,and 4:

Copies of comments included in the Final EA. A height waiver will be required and the appropriate application will be submitted prior to construction.

Item 5:

Complied and incorporated comments into the Final EA.

We appreciate your participation in the review process.

Sincerely,

Peter Melnyk, P.E., PhD
Vice President

Enclosures

Peter Melnyk

From: "Yamamoto, Terrie A O" <YamamotoTA@PWCPEARL.NAVY.MIL>
To: "'Melnyk, Peter'" <pmelnyk@gmpassociates.com>
Cc: "Felise, Lonnie A (PWCPEARL)" <FeliseLA@PWCPEARL.NAVY.MIL>; "Miyashiro, Randy M" <MiyashiroRM@PWCPEARL.NAVY.MIL>
Sent: Tuesday, December 31, 2002 9:19 AM
Subject: DRAFT EA FOR HONOULIULI WWTP NEW SOLIDS HANDLING FACILITY

Hi Peter,

My name is Terrie Yamamoto I work for the Navy Region Hawaii Environmental Department, Compliance Division. I received the Darft Environmental Asessment Honouliuli Wastewater Treatment Plant New Solids Handling Facilities report to review from the Navy Region Hawaii Environmental Department Regional Environmental Coordinator Division.

I had a few comments to the DRAFT EA:

1) Can one of the alternatives be to try and secure a more firm commitment from the Navy to compost the Honoulilui sludge? There already is a facility in place that handles the biosolids (The Navy's BTF). Currently the contract with the Navy is an open-ended agreement, which can be terminated by either party with a 30-day notice, so can one of the alternatives be to secure a more firm contract with the Navy?

2) One of the reasons, stated in the report, for the new process is that the current process of heat treating the sludge is a significant energy consumer. The BTF has requested that the biosolids from Honouliuli not be so dry (i.e. don't heat treat as long). It would save on the use of water on the composting side and reduce the energy consumption on the WWTP side. So securing a more firm contract with the Navy could be an alternative.

3) Currently Honouliuli sends 10,400 wet tons per year to the BTF. The BTF can handle 100% of all the biosolids generated at Honouliuli. No need to find an alternative disposal/use for biosolids generated at Honouliuli at the present time. I believe the Navy can accomodate the future increase of sludge generated through 2020 by expanding their facility. Has this alternative been explored?

Thanks for your time. Please call me if you have any questions.

Terrie Yamamoto
Navy Region Hawaii
Regional Environmental Department
Compliance Division
471-1171 x204

HAWAII, INC.

Engineers/Architects

March 17, 2003

Terry Yamamoto
United States Navy
Hawaii Environmental Department, Compliance Division

RE: Comments Submitted Regarding the Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

The following is the response to the comments submitted:

Item 1:

The contract with the Navy is an opened ended contract that allows each party to terminate the contract with 30 day notice. Presently the City and County of Honolulu is looking for a long term commitment in order to market the product. Securing a more firm contract with the U.S. Navy may be an alternative if there is a long term commitment.

Item 2:

Please refer to the attached figure. The graph (right hand ordinate axis) shows little change in cake solids with either changes in flow, i.e. residence time or operating temperature. Anaerobically digested sludge will not dewater beyond 25% solids which removes the Navy's concern.

Item 3

Presently Honouliuli WWTP is sending 10 dry tons per day (approximately 10,400 wet tons per year) to the Navy's composting operation. At this time that is 100% of the WWTP's dewatered sludge.

As for the alternative proposed in regards to expanding the Navy's facility to accommodate any future increase in dewatered sludge, this alternative would need to incorporate a commitment to marketing the composting product.

We appreciate your participation in the review process.

Sincerely,

Peter Melnyk, P.E., PhD
Vice President

Enclosures

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
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
Email: oeqc@mail.state.hi.us

Post-it® Fax Note 7671	Date 12/30/02	# of pages ▶ 1
To Dr. Peter Melnyk	From P Chan	
Co./Dept. GMP	Co.	
Phone #	Phone # 527-4324	
Fax #	Fax # (For your use)	

December 23, 2002

Mr. Po Chan
Department of Design and Construction
City and County of Honolulu
650 South King Street, 14th Floor
Honolulu, Hawai'i 96813

Mr. Peter Melnyk
GMP Hawai'i Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawai'i 96813

Dear Messrs. Chan and Melnyk:

The Office of Environmental Quality Control has reviewed the October 2002, draft environmental assessment under Chapter 343, Hawai'i Revised Statutes for Honouliuli Waste Water Treatment Plant New Solids Handling Facility in the judicial district of 'Ewa and offers the following comments for your consideration and response.

1. ALTERNATIVES ANALYSIS: Of the alternatives considered (incineration, land disposal, beneficial use through anaerobic digestion, composting and no action), it appears that the City's preferred alternative is beneficial use through anaerobic digestion. Please rank the other alternatives as to preference. Also, please clarify what is meant on page 2-15 by the last sentence which states that "[t]he City and County of Honolulu request for bid (RFB) to design, build and operate a composting facility at the Sand Island WWTP did not generate a responsible bid." Are there any other sites on O'ahu with an adequate buffer zone that would support the composting operation?
2. EAST O'AHU: Under "No Action" on page 2-16, mention is made of the anticipated growth of East O'ahu which appears to be a typographical error.
3. GENTRY 'EWA MAKAI: The Office has just received an EIS preparation notice for the Gentry 'Ewa Makai Project. Please consult with the Department of Planning and Permitting and the Ms. Debra Luning of Gentry Investment Properties, Inc., telephone (808) 599-8370 as to potential impacts from the Honouliuli Solid Facility on the proposed development.
4. SUSTAINABLE BUILDING GUIDELINES, USE OF NATIVE PLANTS, AND GLASSPHALT. We respectfully refer you to our website at http://www.state.hi.us/health/oeqc/index.html for guidance documents on sustainable building and the use of native plants in landscaping. Also, please plan to use glassphalt aggregate for proposed paving at the project site.

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

Sincerely,

GENEVIEVE SALMONSON
Director

HAWAII, INC.

Engineers/Architects

March 17, 2003

Genevieve Salmonson
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street.
Honolulu, Hawai'i 96813

RE: Comments Submitted Regarding the Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

The following is the response to the comments submitted:

Item 1a:

The City and County has indicated the preferred alternative and has left the other alternatives unranked at this time.

Item 1b

The contractor that was proposing the composting alternative never submitted a final bid to the City and County.

Item 1c:

Presently although adequate sites for the composting alternative may exist on Oahu, the City and County does not have access to any sites that have an adequate buffer zone that would support the composting alternative.

Item 2:

Complied and incorporated comments into the Final EA.

Item 3:

Ms. Debra Lunning was consulted and she received a copy of the Draft EA.

1100 Alakea Street • Suite 1800 • Honolulu, Hawaii 96813-2833 • Telephone: (808) 521-4711 • Fax:(808) 538-3269

HAWAII, INC.

Engineers/Architects

Item 4:

The proposed project will take into consideration the use of sustainable building materials and the use of native plants for landscaping.

We appreciate your participation in the review process.

Sincerely,

Peter Melnyk, P.E., PhD
Vice President

Enclosures

HAWAII, INC.

Engineers/Architects

March 17, 2003

Linnel T. Nishioka
State of Hawaii, Department of Land and Natural Resource Division
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawaii 96809

RE: Comments Submitted Regarding the Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

The following is the response to the comments submitted:

Item 1:

Complied. The proposed facility will not increase the potable water demand at the facility.

We appreciate your participation in the review process.

Sincerely,

Peter Melnyk, P.E., PhD
Vice President

Enclosures

1100 Alakea Street • Suite 1800 • Honolulu, Hawaii 96813-2833 • Telephone: (808) 521-4711 • Fax:(808) 538-3269

JAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN
CHAIRPERSON

BRUCE S. ANDERSON
MEREDITH J. CHING
CLAYTON W. DELA CRUZ
BRIAN C. NISHIDA
HERBERT M. RICHARDS, JR.

LINNEL T. NISHIOKA
DEPUTY DIRECTOR

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

November 19, 2002

Mr. Peter B. Melnyk, P.E., PhD
GMP Hawaii, Inc.
1100 Alakea St., Ste. 1800
Honolulu, HI 96813-2833

Dear Mr. Melnyk:

SUBJECT: Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

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

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

[ ] We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

[ ] We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

[ ] We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

[ ] A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.

[ ] The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.

[ ] Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

[ ] We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.

[ ] If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).

[ ] If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

[X] OTHER:

Section 1.5 of the subject document describes the current use of potable and reclaimed water at the WWTP. We recommend that the EA disclose any increase(s) in demand(s) resulting from the proposed project and the proposed source(s) of supply. Significant demand increases should be reflected in the county's Water Use and Development Plan.

If there are any questions, please contact Lenore Nakama at 587-0218.

Sincerely,

LINNEL T. NISHIOKA
Deputy Director

LN:ss

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

December 23, 2002

Ref.: DEAHONOULIULIWWTP.RCM2
L-3637/3578/3462

LD-NAV

Peter Melnyk Ph.D., P.E.
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Mr. Dr. Melnyk:

Subject: Draft Environmental Assessment, Honouliuli Waste Water Treatment Plant - New Solid Handling Facilities, Ewa, Oahu, Hawaii - TMK (1) 9-1-13: 007

This is a follow-up to our letter (Re: DEAHONOULIULWWTP.RCM) to you dated December 16, 2002, pertaining to the subject matter.

Attached herewith is a copy of the Commission on Water Resource Management, Engineering Division and Division of State Parks comments.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0384.

Very truly yours,

Charlene E. Unoki

for DIERDRE S. MAMIYA
Administrator

C: ODLO

BENJAMIN J. CAYETANO
GOVERNOR

GILBERT S. COLOMA-AGARAN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

ERIC T. HIRANO
DEPUTY DIRECTOR

LINNEL T. NISHIOKA
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

P.O. Box 621
HONOLULU, HAWAII 96809

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

TO:
- x Division of Aquatic Resources
- x Division of Forestry & Wildlife
- √ Na Ala Hele Trails
- x Division of State Parks
- x Division of Boating & Ocean Recreation
- x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering Branch
- x Oahu District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

Please review the attached document covering the subject matter and submit your comments (if any) on Division letterhead signed and dated within the time requested above. Should you need more time to review the subject matter, please contact Nick Vacarro at Ext. 7-0438.

**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

(✓) We have no comments. ( ) Comments are attached.

Signed: _____
Date: 11/19/02

BENJAMIN J. CAYETANO
GOVERNOR

BOARD OF LAND AND ...

ERIC T. HIRANO
DEPUTY DIRECTOR

LINNEL T. NISHIOKA
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

P.O. Box 621
HONOLULU, HAWAII 96809

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

TO:
- x Division of Aquatic Resources
- x Division of Forestry & Wildlife
- __ Na Ala Hele Trails
- x Division of State Parks
- x Division of Boating & Ocean Recreation
- x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering ~~Branch~~ Division
- x Oahu District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

Please review the attached document covering the subject matter and submit your comments (if any) on Division letterhead signed and dated within the time requested above. Should you need more time to review the subject matter, please contact Nick Vacarro at Ext. 7-0438.

**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

( ) We have no comments. (X) Comments are attached.

Signed: Cindy T. Hemmi
Date: 11/27/02

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

L-4012

COMMENTS

We confirm that the project site is located in Zone D. This is an area in which flood hazards are undetermined.

However, if further studies determined that the project site is within the flood zone, the proposed improvements must comply with rules and regulations of the National Flood Insurance Program (NFIP) and all applicable County Flood Ordinances. If there are questions regarding the NFIP, please contact the State Coordinator, Mr. Sterling Yong, of the Department of Land and Natural Resources at 587-0248.

Should you have any questions, please call Mr. Andrew M. Monden of the Planning Branch at 587-0229.

Signed: Eric T. Hirano
ERIC T. HIRANO, CHIEF ENGINEER

Date: 11/22/02

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4513-03
2019.6

BENJAMIN J. CAYETANO
GOVERNOR

ANTHONY J.H. CHING
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

November 22, 2002

Peter Melnyk Ph.D., P.E.
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Mr. Melnyk:

Subject: Draft Environmental Assessment for the Honouliuli WWTP New Solids Handling Facility EA

We acknowledge receipt of your letter dated November 1, 2002 regarding the above subject draft environmental assessment for the Honouliuli WWTP.

Given the location, scope, and nature of the project, we have no comments to offer at this time. Thank you for the opportunity to comment on the subject project. Please feel free to contact me at 587-3822 should you require clarification or any further assistance.

Sincerely,

ANTHONY J. H. CHING
Executive Officer

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EMD / WB

021026

November 21, 2002

Dr. Peter B. Melnyk
Vice President
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Dr. Melnyk:

Subject: Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant (WWTP) New Solids Handling Facilities

We have reviewed the subject document and have no objections to the project as long as the final use and disposal of the wastewater sludge meets all state and federal regulations.

Should you have any questions, please call the Wastewater Branch at 586-4294.

Sincerely,

DENNIS TULANG, P.E., CHIEF
Wastewater Branch

GST:erm

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

November 15, 2002

REPLY TO
ATTENTION OF

Regulatory Branch

Dr. Peter B. Melnyk, P.E.
Vice President
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Dr. Melnyk:

This responds to your request for review of the Draft Environmental Assessment (DEA) for the proposed Honouliuli Wastewater Treatment Plant (WWTP) New Solids-Handling Facilities, which will be located within the boundaries of the existing WWTP site (TMK 9-1-013-007 and 9-1-069-004). We have reviewed the document with respect to the Corps' authority to issue Department of the Army (DA) permits under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

Based on information provided in the DEA, I have determined that the proposed project will not involve the discharge of dredged or fill material into waters of the United States; therefore, a DA permit is not required.

File No. 200300140 has been assigned to this project. Should you have questions concerning this preliminary determination, please contact Mr. Peter Galloway of my staff (telephone (808) 438-8416; fax (808) 438-4060). Mailed correspondence should be addressed to: Regulatory Branch (CEPOH-EC-R/P. Galloway); U.S. Army Engineer District, Honolulu; Building 230; Fort Shafter, Hawaii 96858-5440. Thank you foi working with the Corps of Engineers to protect the aquatic resources of Hawaii.

Sincerely,

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

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

November 14, 2002

Peter Melnyk PhD, P.E.
Vice President
GMP Hawaii, Inc.
Engineers/Architects
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Dr. Melnyk:

Subject: Draft Environmental Assessment for the Honouliuli WWTP Solids Handling Facility EA

Thank you for forwarding the subject Draft Environment Assessment for review and comment by the staff of the U.S. Geological Survey, Water Resources Discipline, Hawaii District office. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning it for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
District Chief

Enclosure

5/8-03
11C 19-6

LINDA LINGLE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
ACTING DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD / CWB

12006PKP.02

December 5, 2002

Dr. Peter B. Melnyk, Ph.D., P.E.
Vice President
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Dr. Melnyk:

Subject: Draft Environmental Assessment
Honouliuli WWTP New Solids Handling Facility

The Department of Health, Clean Water Branch (CWB) has reviewed the subject document and has the following comments:

1. The Army Corps of Engineers should be contacted to identify whether a Federal permit (including a Department of Army permit) is required for this project. If it is determined that a Federal permit is required for the subject project, then a Section 401 Water Quality Certification would also be required from our office.

2. If the construction project involves any of the following activities, a National Pollutant Discharge Elimination System (NPDES) permit coverage is required for each activity:

   a. Construction activities, including clearing, grading, and excavation that result in the disturbance of equal to or greater than five (5) acres of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the commencement of the construction activities.

      Note: *After March 10, 2003, an NPDES permit will be required for construction activities, including clearing, grading, and excavation that result in the disturbance of one (1) acre or more.*

   b. Discharges of hydrotesting water.

   c. Discharges of construction dewatering effluent.

The CWB requires that Notices of Intent (NOI) for NPDES general permits be submitted 30 days before the commencement of the respective activities. The amendments to HAR, Chapter 11-55, may also require a copy of the NOI or NPDES permit application to be submitted to the State Department of Land and Natural Resources, State Historic Preservation Division. The NOI forms can be picked up at our office or downloaded from our website at *http://www.state.hi.us/doh/eh/cwb/forms/index.html.*

Should you have any questions, please contact Ms. Kris Poentis of the Engineering Section, CWB, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KP:ndp

H513-00
RIC 19,6

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCES MANAGEMENT

DEPUTIES
ERIC T. HIRANO
LINNEL NISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

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

HAWAI'I HISTORIC PRESERVATION DIVISION REVIEW

Log #: *31234*
Doc #: 0211EJ22

Applicant/Agency: Peter Melnyk Ph.D., P. E.
Vice President
Address: GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

SUBJECT: Chapter 6E-8 Historic Preservation Review - Draft Environmental Assessment for the Honouliuli WWTP Solids Handling Facility

Ahupua`a: Honouliuli
District, Island: `Ewa, O`ahu
TMK: (1) 9-1-013:007, 9-1-069:004

1. We believe there are no historic properties present, because:

___ a) intensive cultivation has altered the land
✓ b) residential development/urbanization has altered the land
✓ c) previous grubbing/grading has altered the land
___ d) an acceptable archaeological assessment or inventory survey found no historic properties
✓ e) other: The WWTP is an existing facility. No historic resources were found during the development of the facility.

2. This project has already gone through the historic preservation review process, and mitigation has been completed ___.

✓ Thus, we believe that "no historic properties will be affected" by this undertaking

Staff: Elaine Jourdane Date: 11/29/02

Title: Elaine Jourdane, Assistant Archaeologist O`ahu Phone (808) 692-8027

BENJAMIN J. CAYETANO
GOVERNOR

RECEIVED
02 NOV 15 A9:41
COMMISSION ON WATER RESOURCE MANAGEMENT

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

BOARD OF LAND AND NATURAL RESOURCES

ERIC T. HIRANO
DEPUTY DIRECTOR

LINNEL T. NISHIOKA
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

TO:
- x Division of Aquatic Resources
- x Division of Forestry & Wildlife
- __ Na Ala Hele Trails
- x Division of State Parks
- x Division of Boating & Ocean Recreation
- ✓ x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering Branch
- x Oahu District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

Please review the attached document covering the subject matter and submit your comments (if any) on Division letterhead signed and dated within the time requested above. Should you need more time to review the subject matter, please contact Nick Vacarro at Ext. 7-0438.

**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

( ) We have no comments. (X) Comments are attached.

Signed: _____
Date: 11-26-02

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

December 16, 2002

Ref.: DEAHONOULIULIWWTP.RCM

LD-NAV
L-4012/3274/3373/3393/3358

Peter Melnyk Ph.D., P.E.
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Mr. Dr. Melnyk:

Subject: Draft Environmental Assessment, Honouliuli Waste Water Treatment Plant - New Solid Handling Facilities, Ewa, Oahu, Hawaii

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA). A copy of the DEA covering the subject matter was distributed or made available to the following Department of Land and Natural Resources' Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Division of State Parks
- Commission on Water Resource Management
- Engineering Division
- Oahu District Land Office
- Planning and Technical Services

Based on the attached responses, the Department has no comment to offer on the subject matter.

If the Land Division receives any comments, they will be forwarded to your office at that time.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0384.

Very truly yours,

DIERDRE S. MAMIYA
Administrator

C: Oahu District Land Office

BENJAMIN J. CAYETANO
GOVERNOR

CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

ERIC T. HIRANO
DEPUTY DIRECTOR

LINNEL T. NISHIOKA
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

P.O. Box 621
HONOLULU, HAWAII 96809

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

FROM: ~~TO:~~
- x Division of Aquatic Resources
- x Division of Forestry & Wildlife
- __ Na Ala Hele Trails
- x Division of State Parks
- x Division of Boating & Ocean Recreation
- x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering Branch
- x Oahu District Land Office

TO: ~~FROM:~~ Charlene E. Unoki, Acting Assistant Administrator
Land Division

Charlene

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

Please review the attached document covering the subject matter and submit your comments (if any) on Division letterhead signed and dated within the time requested above. Should you need more time to review the subject matter, please contact Nick Vacarro at Ext. 7-0438.

**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document. for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

(X) We have no comments. ( ) Comments are attached.

Signed: _____
Date: 11/14/02

BENJAMIN J. CAYETANO
GOVERNOR

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

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

TO:
- x Division of Aquatic Resources
- x Division of Forestry & Wildlife
- __ Na Ala Hele Trails
- x Division of State Parks
- √x Division of Boating & Ocean Recreation
- x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering Branch
- x Oahu District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

Charlene

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

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**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

(√) We have no comments. ( ) Comments are attached.

Signed: W M Lowe
Date: _____

BENJAMIN J. CAYETANO
GOVERNOR

ERIC T. HIRANO
DEPUTY DIRECTOR

LINNEL T. NISHIOKA
DEPUTY DIRECTOR FOR
THE COMMISSION ON WATER
RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

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

NOV 13 2002

L-4012
Suspense Date: 12/9/02

MEMORANDUM

TO:
- x Division of Aquatic Resources
- ✓x Division of Forestry & Wildlife
- __ Na Ala Hele Trails
- x Division of State Parks
- x Division of Boating & Ocean Recreation
- x Commission on Water Resource Management

Land Division Branches:
- x Planning & Technical Services
- x Engineering Branch
- x Oahu District Land Office

FROM: Charlene E. Unoki, Acting Assistant Administrator
Land Division

SUBJECT: Draft environmental assessment, Honouliuli Wastewater Treatment Plant New Solids Handling Facilities, Ewa, Oahu, tax map key (1) 9-1-13:7

Please review the attached document covering the subject matter and submit your comments (if any) on Division letterhead signed and dated within the time requested above. Should you need more time to review the subject matter, please contact Nick Vacarro at Ext. 7-0438.

**Note: One (1) copy of the document is available for review in the Land Division Office, Room 220. Sign out slips are available at the counter for those who wish to review the document for a 24-hour period.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments. Thank you.

(X) We have no comments. ( ) Comments are attached.

Signed:
Date:

MICHAEL G. BUCK, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE
NOV 15 2002

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

GEN-6 (EIS/EA)

December 11, 2002

Peter B. Melnyk, P.E., PhD
GMP Hawaii, Inc.
1100 Alakea Street - Suite 1800
Honolulu, HI 96813-2833

Dear Mr. Melnyk:

Re: New Solids Handling Facility
Honouliuli Wastewater Treatment Plant

Thank you for the opportunity to comment on the November 2002 draft EA of the New Solids Handling Facility at Honouliuli Wastewater Treatment Plant, as proposed by the Division of Wastewater Management, Department of Design and Construction, City & County of Honolulu. We have reviewed the subject document and have no comments at this time.

HECO reserves the opportunity to further comment on the protection of existing powerlines and electric power facilities that may be affected by the project until construction plans are finalized. Again, thank you for the opportunity to comment on this draft EA.

Sincerely,

Kirk S. Tomita
Senior Environmental Scientist

cc: Ms. Genevieve Salmonson (OEQC)

H513-00
ltr 19.6

BOARD OF WATER SUPPLY

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

December 5, 2002

Mr. Peter B. Melnyk
GMP Hawaii, Inc.
1100 Alakea Street, Suite 1800
Honolulu, Hawaii 96813-2833

Dear Mr. Melnyk:

Subject: Your Letter of November 4, 2002 on the Draft Environmental Assessment for Honouliuli Wastewater Treatment Plant New Solids Handling Facilities

Thank you for the opportunity to review the Draft Environmental Assessment for the proposed project.

The existing water system is presently adequate to accommodate the proposed solids handling facility.

The availability of water will be confirmed when the building permit is approved. When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

The proposed project is subject to Board of Water Supply Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

If you have any questions, please contact Joseph Kaakua at 527-6123.

Very truly yours,

for CLIFFORD S. JAMILE
Manager and Chief Engineer

SECTION 11
REFERENCES

SECTION ELEVEN

REFERENCES

Analytical Planning Consultants 1999. "Environmental Assessment for Honouliuli Wastewater Reclamation Plant. Prep U.S. Filter Corporation.

City and County of Honolulu 1992. *General Plan: Objectives and Policies*. Dept. of Planning Honolulu.

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GMP Associates, Inc. 2002. *Honouliuli WWTP New Solids Handling Facilities*, Preliminary Submittal Prep for City and County of Honolulu, Dept. of Wastewater Management.

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Helber Hjastert & Fee 1993. *Kapolei Area Long Range Master Plan.* Prepared for Barbers Point Redevelopment Commission.

State of Hawaii, Department of Business, Economic Development and Tourism 1997. "Population and Economic Projections for the State of Hawaii to 2020". Research and Economic Analysis Division.

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University of Hawaii at Hilo, Department of Geography 1998. *Atlas of Hawaii.* Third Edition S.P. Juvic and J.O. Juvic Editors, T.R. Paradise, Chief Cartographer. University Press, Honolulu.

U.S. Environmental Protection Agency. EPA Part 503 Biosolids Rule.

U.S. Environmental Protection Agency. 40 CFR 50 Air Quality Standards.

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APPENDIX A

APPENDIX A

BACKGROUND INFORMATION ON CRITERIA AIR POLLUTANTS

This Appendix provides a brief background on the pollutants for which ambient standards have been developed.

O_3 – Ozone is the main constituent in photochemical air pollution. It is formed in the atmosphere by chemical reaction of nitrogen oxides (NO_x) and volatile compounds (VOCs) in the presence of sunlight. In the upper atmosphere, O_3 shields the earth from harmful ultraviolet radiation, however, at ground level it can cause harmful effects on humans and plants.

NO_2 – Nitrogen dioxide is a brownish, highly corrosive gas with a pungent odor. It is formed in the atmosphere from emissions of nitrogen oxides (NO_x). Sources of nitrogen oxides include electric utilities, industrial boilers, motor vehicles, exhaust, and combustion of fossil fuels. NO_2 is also a component in the atmospheric reactions that produce ground level ozone.

PM_{10} – This pollutant is particulate matter that is 10 microns or less in aerodynamic diameter. The EPA revised the NAAQS for particulate matter in 1987 to cover only PM_{10} because these smaller sized particles have the greatest potential for respiratory health impacts.

CO – Carbon monoxide is a colorless, odorless, tasteless gas under atmospheric conditions. It is produced by the incomplete combustion of carbon fuels with the majority of emissions in urban areas from transportation sources.

Pb – Lead is a naturally occurring substance found in the environment that has been used as an ingredient in paint and gasoline. Particulates of Pb and its compounds enter the air mainly from vehicle exhaust. Lead can be inhaled or ingested and can accumulate in the blood, and soft tissue. The elimination of Pb in gasoline sold in United States has greatly reduced the amount of Pb in ambient air.

SO_x – Sulfur oxides are colorless gases which include SO_2. Emissions of SO_x are largely from sources that burn fossil fuels such as coal and oil. On the Island of Hawaii, a significant source of SO_x emissions is from the on going eruption of Kilauea Volcano.

APPENDIX B

APPENDIX B

TABLE 1 - LAND USE COMPATIBILITY* WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodging	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and	Y	Y	25	30	N	N

optical						
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parenthesis refer to notes.
*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.
Key to Table 1
SLUCM=Standard Land Use Coding Manual.
Y (YES)=Land Use and related structures compatible without restrictions.
N (No)=Land Use and related structures are not compatible and should be prohibited.
NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.
Notes for Table 1
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

SOURCE: FAA, FAR PART 150