BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

February 9, 1995

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

Dear Mr. Gill:

Subject: Negative Declaration for the Waipahu Wells III Station, Waipahu, Oahu, Hawaii, TMK:9-4-05:74

The Board of Water Supply has reviewed the comments received during the 30-day public comment period which began on January 8, 1995. The Board of Water Supply has determined that this project will not have a significant effect and has issued a negative declaration. Please publish this notice in the February 10, 1995 OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final Environmental Assessment.

If you have any questions, please contact Steven Serikaku at 527-5202.

Very truly yours,

Raymond H. Sato

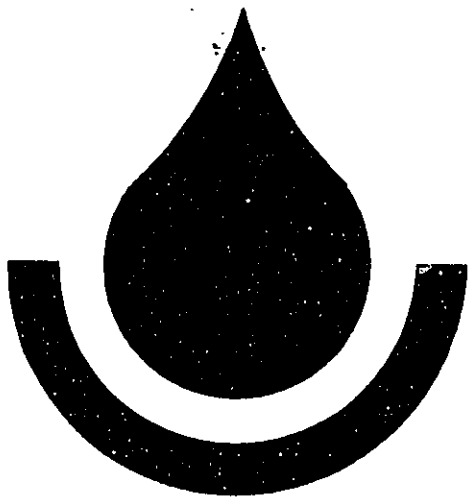
RAYMOND H. SATO
Acting Manager and Chief Engineer

Enclosures

1995-02-23-OA-FEA-Waipahu Wells III Station

FEB 23 1995

WAIPAHU WELLS III STATION



FINAL ENVIRONMENTAL ASSESSMENT

SUBMITTED TO:

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

ASSOCIATES, INC.
Engineers/Architects

FEBRUARY 1995

238000CV

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INTRODUCTION AND SUMMARY

1.1 PROPOSING AGENCY

Board of Water Supply, City and County of Honolulu.

1.2 AGENCIES CONSULTED IN MAKING THE ASSESSMENT

1. Safe Drinking Water Branch, Hawaii State Department of Health
2. Clean Water Branch, Hawaii State Department of Health
3. Department of Land Utilization, City and County of Honolulu
4. Department of General Planning, City and County of Honolulu
5. Commission on Water Resources Management, Department of Land and Natural Resources, State of Hawaii
6. Hawaii State Land Use Commission
7. Hawaii State Office of Environmental Quality Control
8. Historic Sites Preservation Office, Department of Land and Natural Resources, State of Hawaii

9. Office of Conservation and Environmental Affairs, Department of Land and Natural Resources, State of Hawaii

10. Highways Division, Hawaii State Department of Transportation

SECTION 2

SECTION 2

PROJECT DESCRIPTION

2.1 PROJECT SITE

The proposed Waipahu Wells III Station and transmission main project site, shown in Figure 2-1, is a relatively flat piece of abandoned sugarcane land located on Kamehameha Highway approximately one mile north of the Waiawa Interchange and above the Waikele and Crestview subdivisions. The site was chosen by the Board of Water Supply based upon availability, elevation, access, topography and constructability. A new 24-inch transmission main within Kamehameha Highway, will start at the well site and end at the Waiawa Interchange.

The elevation of the well site is approximately 320 feet above sea level. The property is identified by Tax Map Key 9-4-05:74 and is currently owned by Castle & Cooke Homes Hawaii, Inc. However, the Honolulu Board of Water Supply (BWS) is planning to purchase the property in fee. The exact boundaries of the well site are 160'± x 385'±.

2.2 PROPOSED FACILITIES

On July 28, 1993, the Commission of Water Resource Management (CWRM) approved an allocation of 5.839 mgd to the BWS from the Waipahu-Waiawa Aquifer System. The BWS is asking for a proposed use of 3.0 mgd from the CWRM for the Waipahu Wells III Station to supplement the water supply for the growing populations of Waipahu, Ewa, and the Villages of Kapolei. A determination of the actual permitted use at the Waipahu Wells

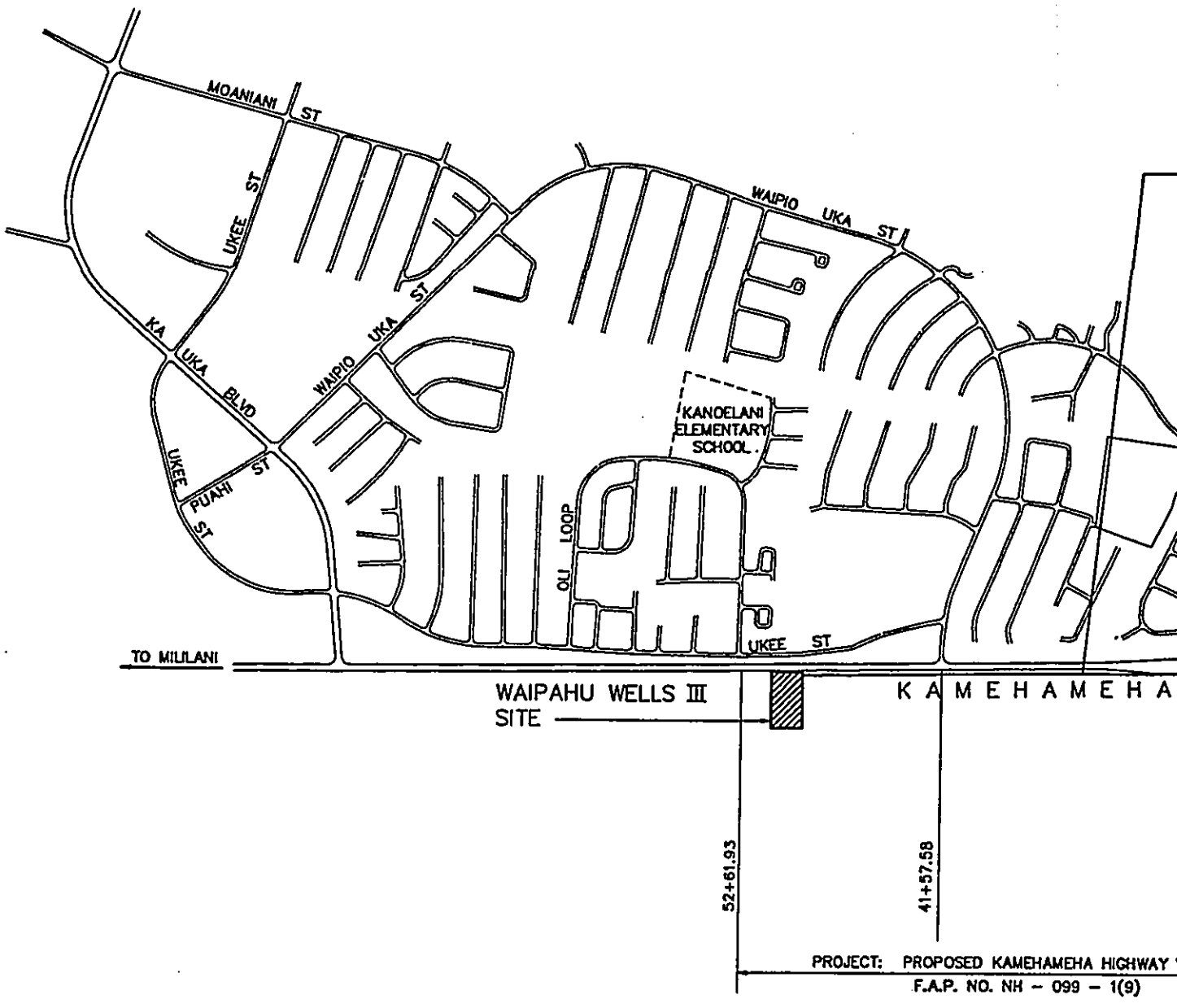
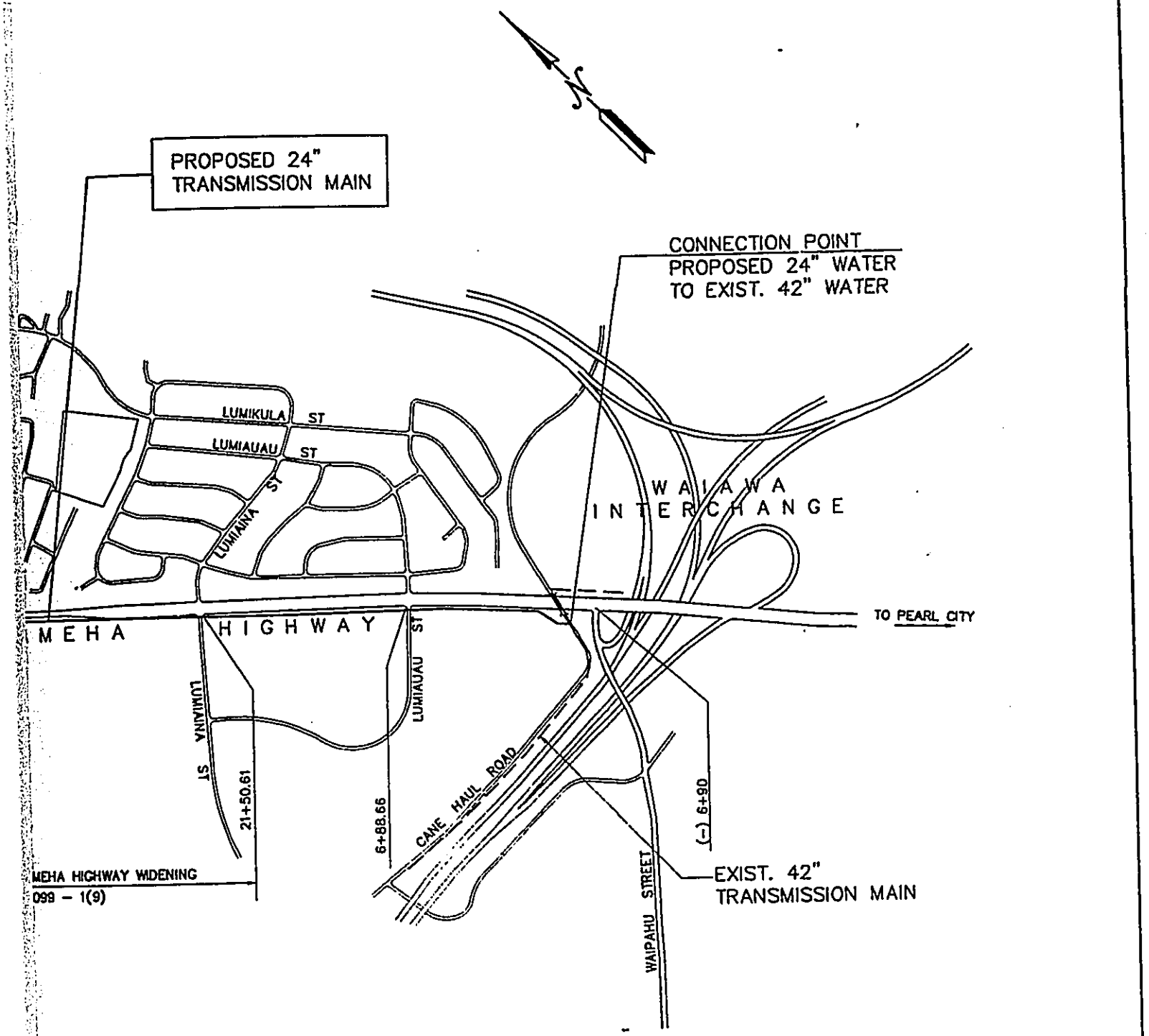


FIGURE 2-1 PROJECT

BRDR-8



OJECT LOCATION

III Station will be determined by BWS, the U.S. Geological Survey, and the CWRM. On October 19, 1994, CWRM approved a Water Use Permit held by the Department of Hawaiian Home Lands for the use of 143,500 gallons per day from Waipahu Wells III. The permit will be transferred to the BWS when the BWS assumes control of the wells. Copies of the Water Use Permits are in Appendix A.

The proposed project involves the installation of five (5) 1000 gpm pumps, ten Granular Activated Carbon (GAC) water treatment units, a 0.1 million gallon (mg) overflow storage reservoir, control building, transmission main, Bailey pressure-reducing valve, access road, landscaping, fencing, irrigation system, electrical equipment and appurtenances.

The five pumps will have a total maximum pump capacity of 7.5 mgd. Additional pumping capacity is for reserve in case of breakdowns or maintenance. The pump's suction will be set at 30 feet below mean sea level (MSL). Information on the submersible pumps can be found in Appendix B.

GAC treatment units are required based on the water quality analysis performed by the BWS. Water quality results are shown in Appendix C. GAC has an excellent adsorptive capacity for most organic and synthetic organic chemicals, such as EDB and DBCP. Each pump will have two GAC contactors which can operate either in the parallel or series configuration.

The GAC unit is a downflow fixed bed unit, where contaminated water enters the top of the vessel and flows down through the bed of activated carbon. Treated water leaves the unit at the bottom. A schematic of a typical GAC unit is shown in Figure 2-2. Periodically, the GAC unit needs to be backwashed

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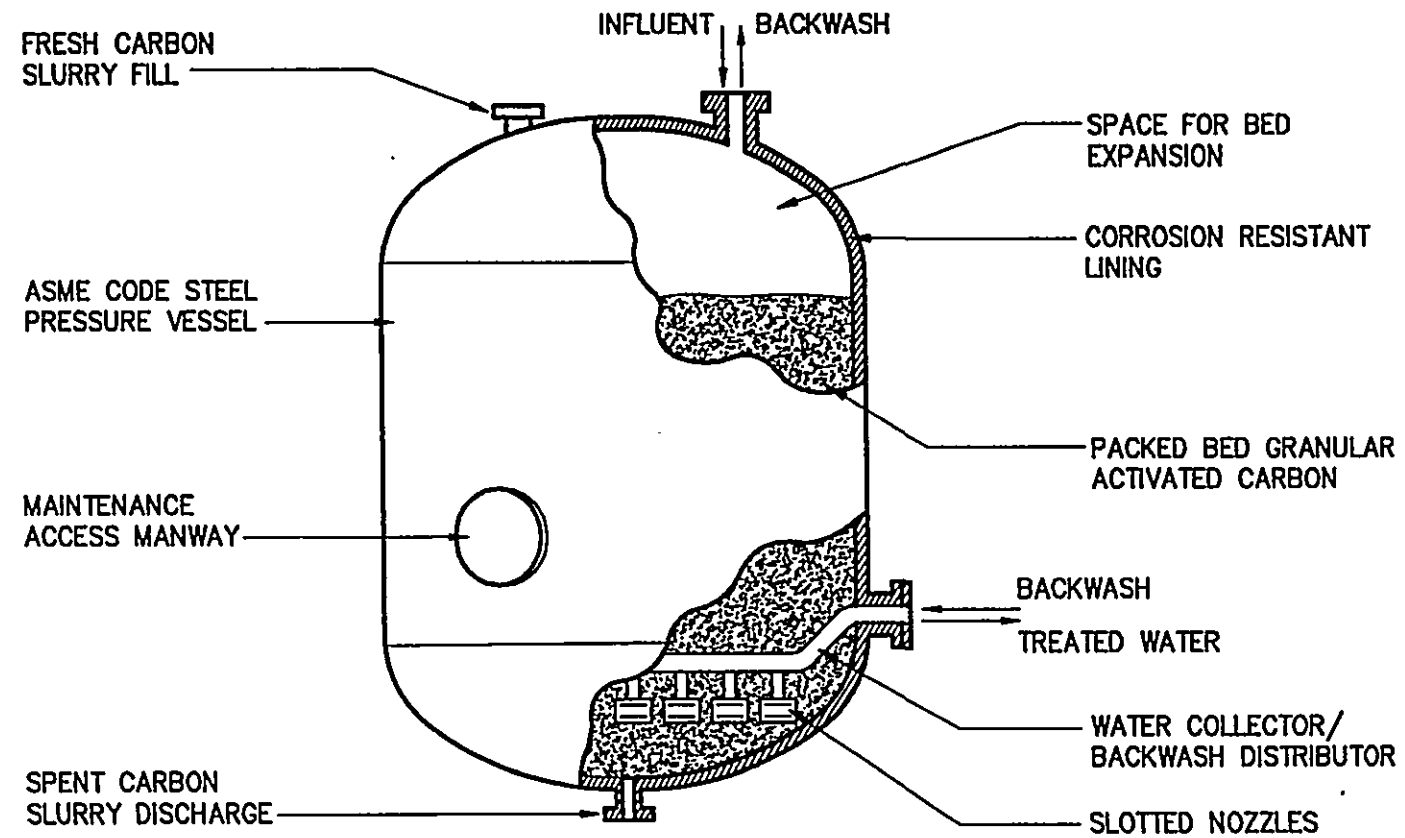


FIGURE 2–2 TYPICAL GAC TREATMENT UNT

to clean the activated carbon. During backwashing, the unit operates in an upflow mode where backwash exits at the top of the unit. An Individual NPDES Permit is needed to dispose of the backwash.

The five wells, whose well numbers are 2400-09 through 2400-13, extend to a depth of between 453 and 458 feet from the ground elevation of between 311 and 318 feet above MSL to an elevation of between 140 and 144 feet below MSL. Appendix D contains information on wells No. 1-5, including well completion reports, cross sections, and pump test results. A 0.10 mg reservoir will be located within the well site fence line. A layout of the five wells and ten GAC units at the project site is shown is Appendix E. The new 24-inch transmission main will connect to an existing 42-inch transmission main at the Waiawa Interchange roughly 5,250 feet from the well site.

2.3 DEVELOPMENT SCHEDULE

The project is expected to be constructed within one year of contractor mobilization. The start of construction is dependent upon obtaining all pertinent permits and approvals, and upon the acquisition of equipment and materials. The estimated construction cost of the project at the time of this report is $7.9 million.

2.4 PROJECT NEED

In the fiscal year ending June 30, 1993, the Board of Water Supply served an estimated population of approximately

853,838 people of which 170,872 is the estimated population served in the Pearl Harbor District. According to the Oahu Water Plan, which was completed in July 1982, the projected population served by the BWS in the Pearl Harbor District in 1990 was 148,961. For the year 1995, the projected population to be served is 158,990. The population in 1993 has already exceeded the projected population for 1995, which means that existing demand for water should also exceed the projected demand.

In order to meet this demand, the number of BWS wells must increase or the production of the existing wells must increase. To minimize excessive drawdown at existing wells due to higher pumping rates, new wells within the Pearl Harbor aquifer are being proposed. The Waipahu Wells III project site is one such location.

SECTION 3

SECTION 3

EXISTING CONDITIONS

3.1 EXISTING LAND USE DESIGNATIONS

The Waipahu Wells III Station and transmission main project boundaries fall within the State Agriculture and Urban Land Use Districts. A State Special Use Permit is not required because the proposals are considered a permissible use within the agricultural district under Chapter 205-4.5(a)(7), Hawaii Revised Statutes. A Conservation District Use permit is also not required. The existing state land use designations are shown in Figure 3-1.

The proposed site is zoned AG-1 on the City and County of Honolulu Zoning Map as shown in Figure 3-2. A Development Plan Land Use Map for the area is shown in Figure 3-3.

3.2 SURROUNDING LAND USES

Most of the land on the west side of Kamehameha Highway is designated either agriculture or urban land, whereas the land on the eastern side of Kamehameha Highway is mostly urban. There are no designated conservation areas close to the project site.

The urban land on the eastern side of Kamehameha Highway is used for residential as well as commercial use. Most of the urban land to the southwest of the proposed site has been developed as the community of Waikele. The agricultural land to

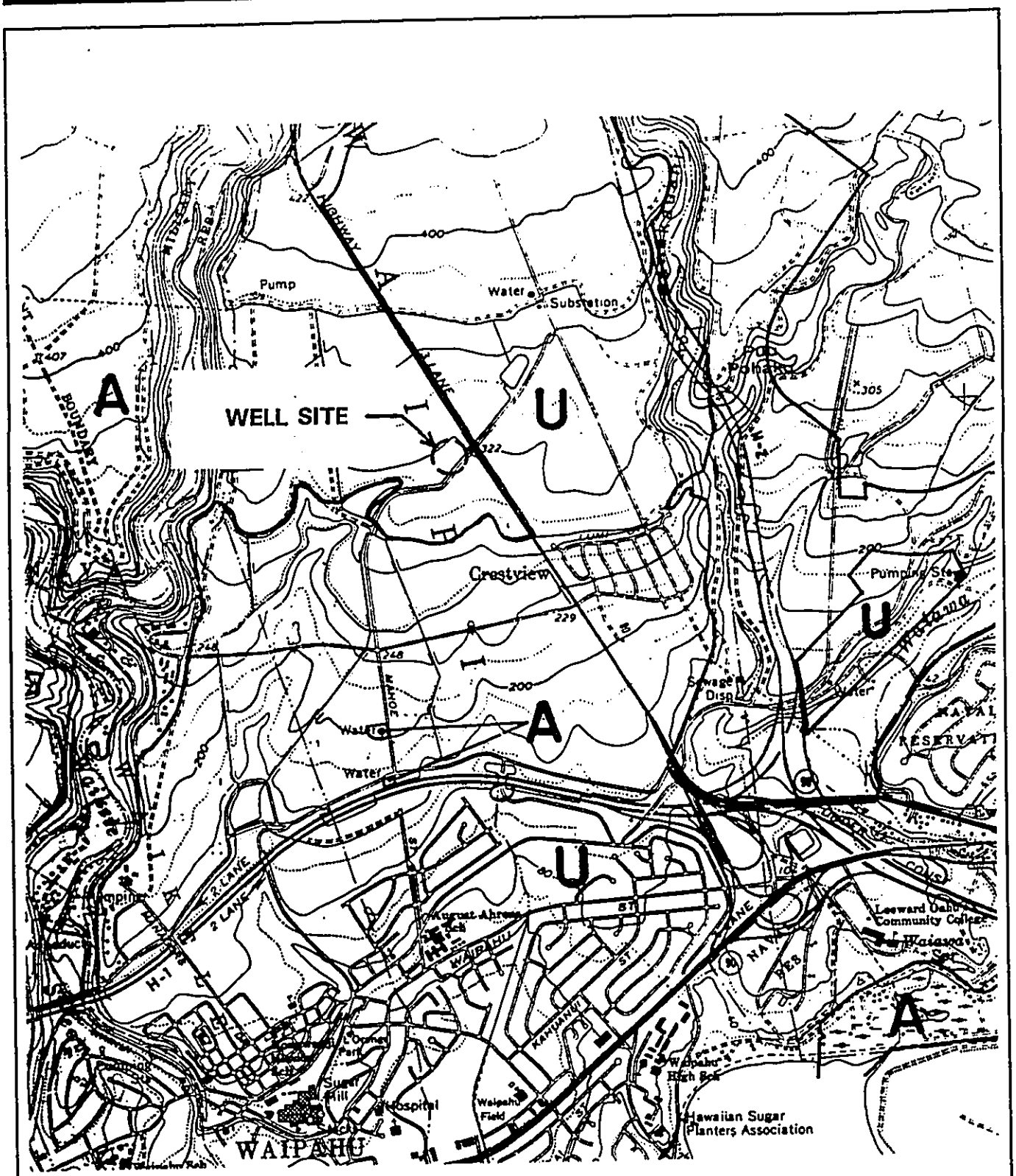


FIGURE 3-1 STATE LAND USE DESIGNATIONS

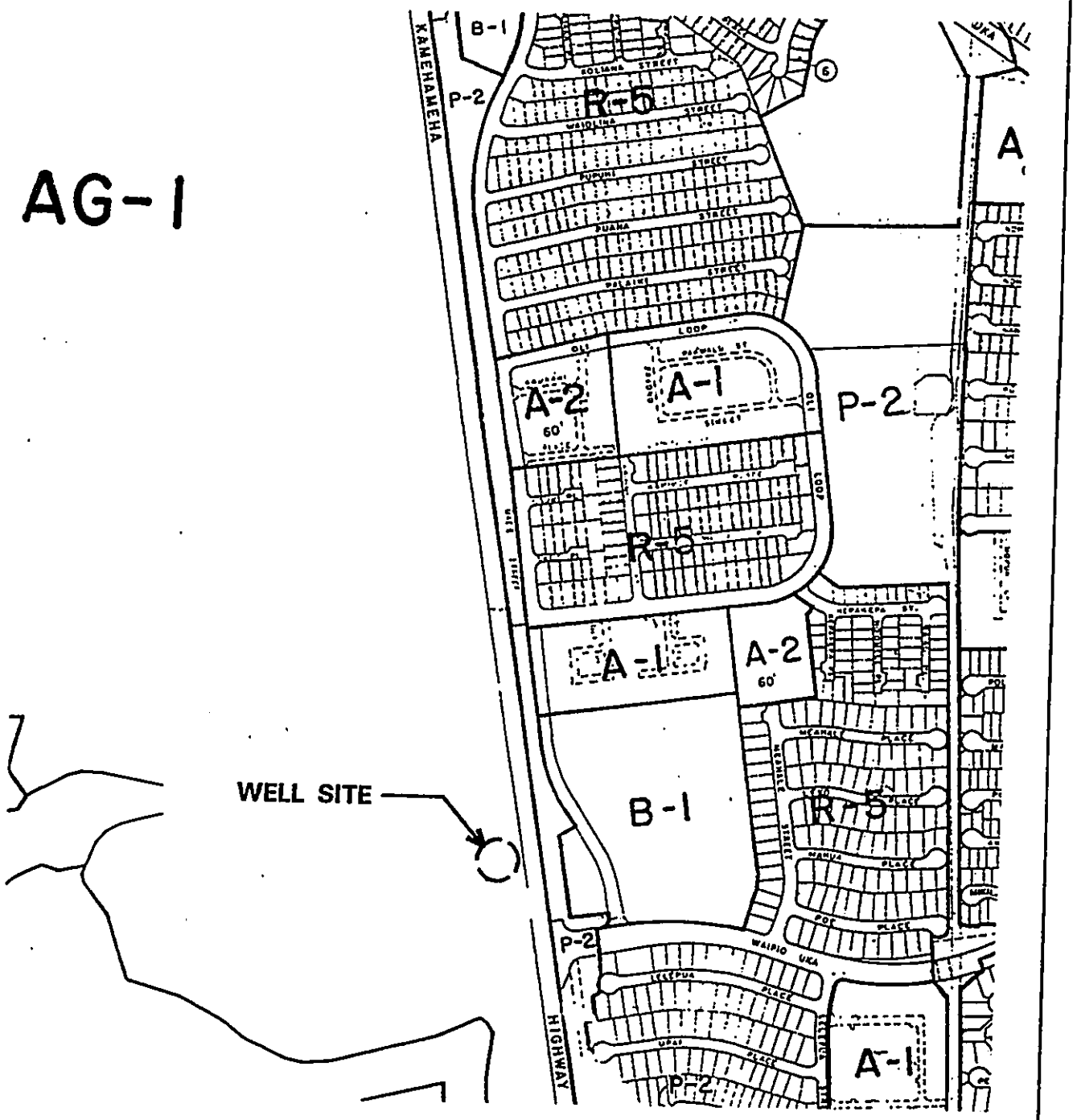


FIGURE 3-2 CITY AND COUNTY ZONING MAP

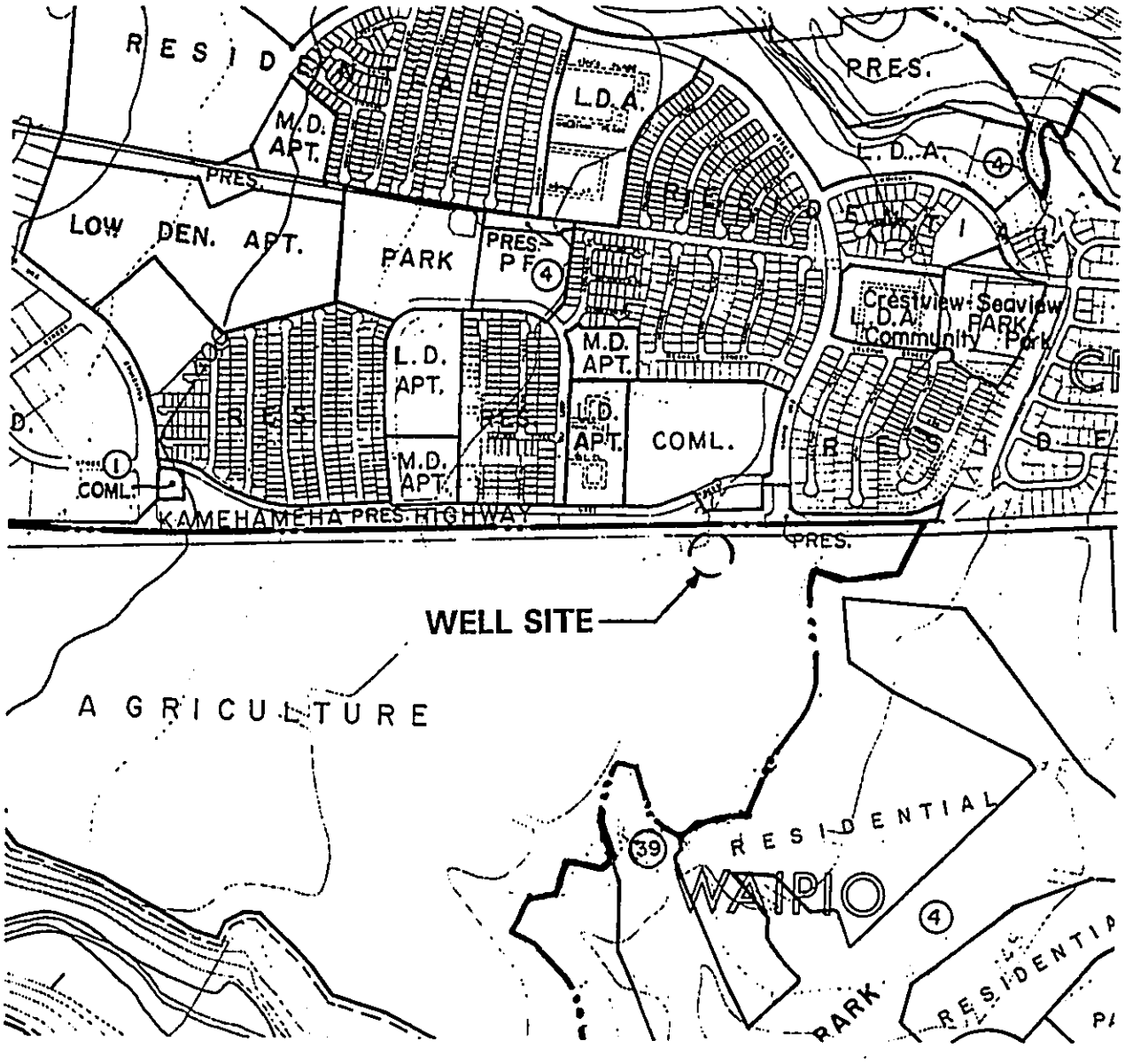


FIGURE 3-3 CITY AND COUNTY LAND USE MAP

the north and west of the site consists of abandoned cane fields and pineapple fields under cultivation.

3.3 CLIMATE

The mean rainfall in the Waipio area is approximately 30 to 35 inches per year. Most of this precipitation occurs during the winter months of October through April. The summer months of May through September are relatively drier.

The temperature in the area is consistent with areas of medium to higher elevations on Oahu and is influenced by the cooling effects of the prevailing north-northeast trade winds. The average temperature ranges from 66 degrees to 84 degrees Fahrenheit.

3.4 HYDROGEOLOGY

The island of Oahu depends upon three types of ground water sources for most of its potable drinking water. Basal water sources are the largest of the three, and underlie most of the southern and northern portions of the island. The second largest source is high-level dike water, which is found between impermeable vertical rock structures along the Koolau and Waianae ranges. The third type of water source is perched water, which is held up on horizontal impermeable lava flows or volcanic ash. Dike and perched water, both of which occur in mountainous

regions, are of excellent quality and, unlike basal water, are not subject to saline contamination.

The Waipio area sits on the Pearl Harbor basal aquifer which is recharged by rainfall and the Schofield high-level aquifer. The Pearl Harbor aquifer consists of extensive permeable lavas and is contained by caprock in the coastal area. Together, these two geological features provide southern Oahu with high-quality basal water.

3.5 GEOLOGY AND TOPOGRAPHY

The central Oahu plateau was formed by the overlap of the Koolau volcano lava flows over the Waianae flank. The plateau was elevated by successive lava flows from the Koolau shield volcano. Subsequently, very hard volcanic rock formed bedrock in the project area.

According to the U.S. Geological Survey (USGS) Map, the land surface of the project site is relatively flat with a gentle slope of approximately 5 percent from the north to the south. Kipapa Gulch, a major drainageway, is to the west of the project site. The topography of the area is shown in Figure 3-3.

3.6 SOILS

Soil at the well site is classified by the U.S. Department of Agriculture Soil Conservation Service as Molokai silty clay loam with slopes of 3 to 15 percent. The Molokai series

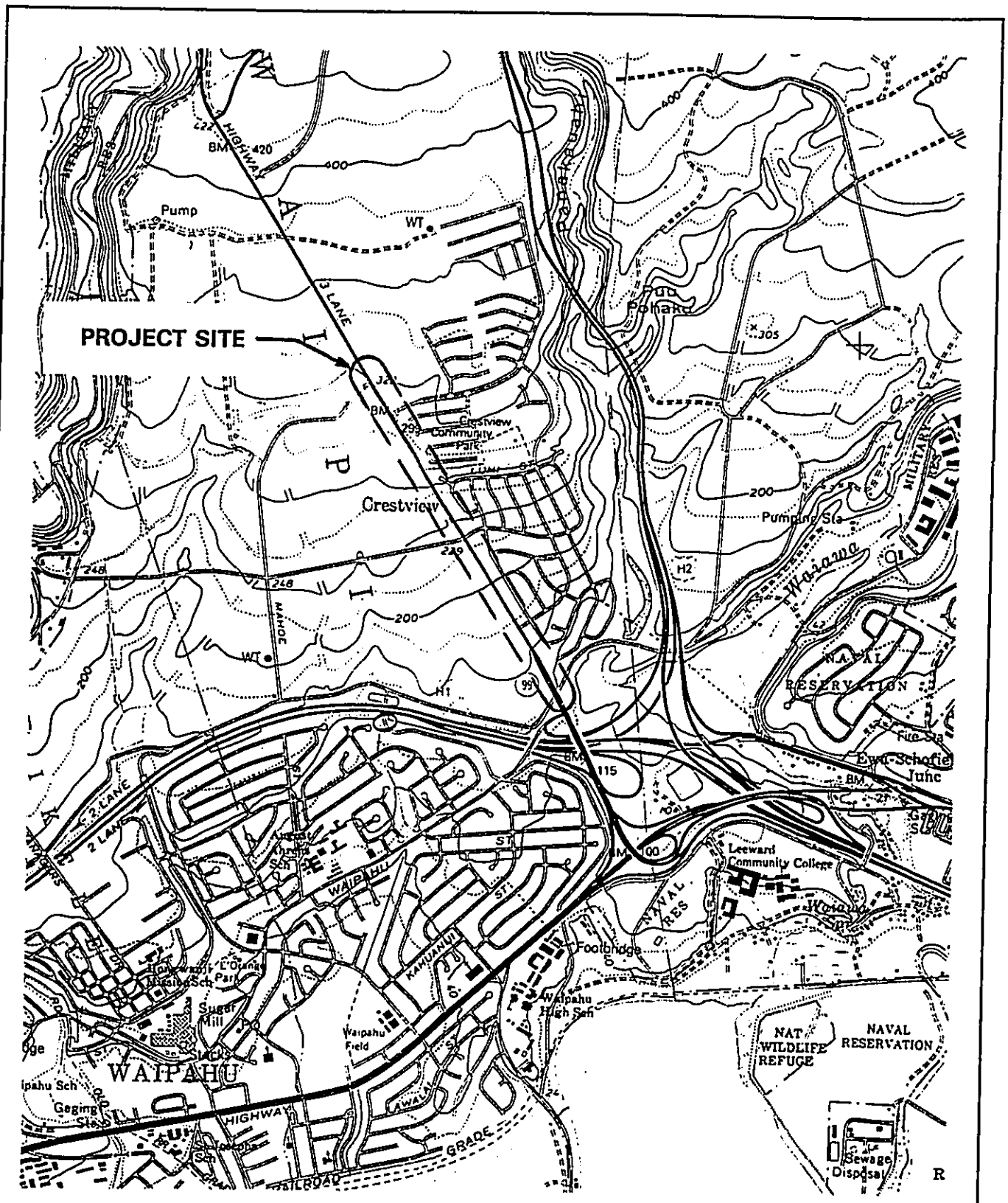


FIGURE 3-4 TOPOGRAPHY OF THE PROJECT SITE

consists of well-drained soils formed by the weathering of igneous rock. Runoff is slow to medium and the erosion hazard is slight to moderate. Small areas of this soil were found as dark reddish-brown silty clay loams approximately 7 inches thick, which overlie fine, gravelly alluvium. This soil can be used for sugar cane, pineapple, pasture or wildlife habitat.

3.7 FLOOD HAZARDS

According to the Flood Insurance Rate Map done for the City and County of Honolulu by the Federal Emergency Management Agency, the well site and the transmission main are in Zone "D," which means that flood hazards in the area are undetermined.

3.8 EARTHQUAKE HAZARDS

The island of Oahu is classified as a Seismic Zone 2B area as per the Uniform Building Code, 1988.

Given that the least active zone is Zone 0, and the most active zone is Zone 3, the possibility of an earthquake occurring on Oahu is considered quite remote. The Board of Water Supply, however, has adopted the more conservative Zone 3 design standards for all of its structures, which would offer a higher stability in the event of an earthquake.

3.9 FLORA AND FAUNA

The project area has been under agricultural cultivation since the early 1900's when its original vegetation was removed. The majority of the existing project site consists of abandoned Oahu Sugar Company cane fields. The remaining vegetation consists mostly of introduced or exotic nuisance species of grasses, shrubs and trees. There were no rare, endangered or threatened plant species found on the project site. Similar surveys done of neighboring sites have also found no rare or endangered species. The animals populating the site are mainly insects, birds and mammals most of which are not unique to the Hawaiian islands. Common bird species which may frequent the site are the barred dove, the lace-necked dove, the Japanese White-eye and the red-crested cardinals. Pests such as the house mouse, the Polynesian rat and the Indian mongoose also frequent the site. There are no rare or endangered animal species at the site.

3.10 ARCHAEOLOGY AND HISTORIC SITES

The Waipahu Wells III station is located in abandoned cane fields which were previously used for extensive agricultural use. Some archaeological sites were found in nearby gulch areas, but none at the proposed project site. It is highly unlikely that a new historic site will be found. In the event that one is discovered, State law requires that construction work in the area

be stopped and the Historic Preservation Division of the Department of Land and Natural Resources be notified immediately.

SECTION 4

SECTION 4

PROJECT IMPACTS AND MITIGATIVE MEASURES

4.1 SHORT-TERM IMPACTS AND MITIGATIVE MEASURES

Short-term impacts will result from site clearing, grubbing and grading; well installation; building construction; landscaping and transmission waterline installation. These activities will be limited to the project site during the construction period of a year. The following sections discuss the short-term impacts and their mitigative measures.

4.1.1 Construction Noise

Noise levels at the construction site and in nearby residential areas are expected to increase due to waterline excavation and transporting of equipment and materials. Where residences line both sides of the highway, noise impacts are expected to be the most significant during construction of the new transmission main.

In order to mitigate noise impacts, the use of muffled construction equipment is recommended. Construction equipment is also expected to be properly maintained. Heavy vehicles must be in compliance with Title 11, Administrative Rules, Department of Health, Chapter 42, Vehicular Noise Control for Hawaii. Also, construction activities will be limited to normal daylight working hours, including holidays.

4.1.2 Air Quality

Short-term air pollution may result from dust/dirt due to clearing, grubbing and grading, along with emissions from construction equipment. Frequent watering of the site should reduce dust emissions. Portions of the site, which are downwind of the project, should be surrounded by dust screens, if necessary. Areas which have been graded should be grassed as soon as possible to prevent dust from becoming a nuisance. All construction equipment and trucks shall be kept in good operating condition and equipped with adequate emissions controls. All open-bed trucks shall be covered when transporting materials which have the potential to become airborne. Overall, the project is not expected to have significant short-term effects on air quality.

4.1.3 Flora and Fauna

No known rare or endangered species of flora and fauna have been found at the site. Surveys of adjacent areas have also reported no known rare or endangered species. Therefore, no short-term impacts are expected.

4.1.4 Surface Water/Groundwater Quality

Construction of the project is not expected to adversely affect surface water quality in the area of the project. The

only impact on surface water would be from stormwater runoff which can be mitigated by erosion control measures. Erosion control measures will include: building berms around the project site to contain stormwater runoff; installing silt fences, if necessary; immediately landscaping areas which have been graded; and grading during dry weather.

The Waipahu Wells III project site sits over the Pearl Harbor aquifer. However, percolation of silt and dirt from construction activities into the aquifer is considered unlikely.

4.1.5 Archaeological/Historical

Since no significant archaeological or historic sites are known to exist at the site, no short-term impacts are expected.

4.1.6 Traffic

Traffic congestion along this stretch of highway, as well as to the north and south of the site, is expected to increase, especially during construction of the 24-inch waterline. Construction is expected to proceed in increments, with each stage having its own State Highways-approved traffic control plan. The contractor is responsible for following the control plan to regulate the flow of traffic, especially during the morning and afternoon rush hours when traffic along Kamehameha Highway is heavy.

In addition to the traffic control plans, diversion of traffic to the H-2 freeway through Ka Uka Boulevard will alleviate some of the congestion which is expected on Kamehameha Highway. Movement of heavy construction equipment should be restricted to periods of light traffic.

In addition to traffic congestion, several bus stops along Kamehameha Highway will have to be temporarily relocated during the construction of the transmission main. The construction should occur in phases which will mitigate the effect of relocating each bus stop.

4.1.7 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 appropriate signs. Highway right-of-way construction will be coned and signed to ensure automobile and pedestrian safety.

4.1.8 Socioeconomic

Construction of the Waipahu Wells III Station and 24-inch transmission main is expected to provide a small number of temporary jobs for local workers. The purchase of materials from local suppliers will help the local area economy.

4.2 LONG-TERM IMPACTS AND MITIGATIVE MEASURES

The long-term impacts of the project will affect the immediate project site, areas beyond the project site and the community. The following sections describe the project's long-term impacts on flora/fauna, drainage, infrastructure, socio-economic, land use, and planned development.

4.2.1 Flora and Fauna

Since there are no rare or endangered plant or animal species at the project site, no significant long-term impacts are expected.

4.2.2 Drainage

The minimal amount of additional runoff generated from the well site will be allowed to sheet flow into adjacent agricultural lands. Since Kamehameha Highway will be restored to its original pavement surface, the stormwater runoff associated with the transmission line construction area is not expected to increase.

4.2.3 Infrastructure

The Waipahu Wells III Station will serve to supplement the water supply in the rapidly developing Waipahu, Ewa, and Kapolei areas.

The new well station has plans for restrooms, and therefore, it is expected to generate a small additional load on the existing sewer system.

Power will be required to operate the pumps and lights. Power consumption by the five pumps is estimated to be 750 hp, which is equivalent to 750 kW, and is not expected to have a significant effect on HECO's existing power grid.

4.2.4 Socioeconomic

The BWS is responsible for providing safe drinking water to the people of the City and County of Honolulu. As the number of residents in Leeward Oahu increases, so should the BWS's capacity to serve them.

The increase in water availability will provide support for both residential communities and commercial developments within the Leeward area. The area of Kaplei is currently under significant development. Several subdivisions have already been built, as well as a golf course and school. Further development of this area is expected. In order to sustain this development, adequate resources must be available. The additional water from

the Waipahu Wells III Station should contribute to increased development in the Leeward area.

4.2.5 Land Use and Planned Development

The Waipahu Wells III Station and transmission main will provide additional capacity to the potable water system in its service area. The additional capacity will enable future subdivisions and amenities to be built.

SECTION 5

SECTION 5

ALTERNATIVES TO THE PROPOSED PLAN

5.1 NO ACTION

The Waipahu Wells III Station and transmission main project is intended to add to the municipal water supply to meet the growing demand of the Waipahu/Waikele area. A no-action alternative is not practical because the BWS may not be able to meet the demands of future area developments. The benefits of providing the public with additional water outweigh the relatively minor impacts of this project.

5.2 DELAYED ACTION

Delayed action is also not a practical alternative. It would only cause additional stress on local existing water system infrastructure serving the area until the new well station is built.

New subdivisions which will not have adequate water supply may have a connection moratorium imposed on them. Basically, the subdivision cannot obtain BWS service until additional water supply is added to the system. The delay in construction could ultimately lead to higher construction costs which would be reflected in the price of new homes in the affected area.

5.3 ALTERNATE SITES

The well site was probably chosen for a number of reasons, some of which may have been adequate elevation head, land acquisition, ease of accessibility and water quality data based on nearby wells.

All five wells have been drilled. If they prove to be unproductive wells, then an alternative site may have to be considered.

5.4 ALTERNATE SOURCES

The Board of Water Supply has considered several alternate sources of water such as desalination, utilization of surface water or brackish water, and recycling of wastewater. Until one of these alternatives becomes feasible from a technical and cost effective standpoint, the Board will continue to emphasize the development of groundwater as its primary source of potable water.

SECTION 6

SECTION 6

NEGATIVE DECLARATION DETERMINATION

The few potential negative impacts which have been identified in this Final Environmental Assessment should be adequately minimized by the suggested mitigative measures. In accordance with Chapter 343, *Hawaii Revised Statutes*, it has been determined that an Environmental Impact Statement is not required for the proposed Waipahu Wells III Station and transmission main project. Therefore, this document constitutes a Negative Declaration.

SECTION 7

SECTION 7

LIST OF NECESSARY PERMITS AND APPROVALS

The following permits and approvals are anticipated for the development of the proposed well station:

- Plan Approval - City and County Department of Public Works
- Plan Approval - Honolulu Board of Water Supply
- Plan Approval - State Commission of Persons with Disabilities
- Grading, Grubbing, Stockpiling Permit - City and County Department of Public Works
- Building Permit - City and County Building Department
- Conditional Use Permit - City and County Department of Land Utilization
- NPDES General Permit - State DOH - Clean Water Branch
- Air Quality Permit - State DOH - Clean Air Branch
- State Permit to Supply Water for Beneficial Use - Department of Land and Natural Resources
- State Historic Preservation Office - Department of Land and Natural Resources
- Construction within State Highways R-O-W - State Department of Transportation - Highways Division
- Pump Installation Permit - Department of Land and Natural Resources

- Water Use Permit - Department of Land and Natural Resources
- Utility Company Approvals - HECO, HTEL, Cable TV

REFERENCES

REFERENCES

1. "Annual Report and Statistical Summary, July 1, 1992 - June 30, 1993." Honolulu Board of Water Supply, City and County of Honolulu.

2. "Final Environmental Impact Statement of Gentry 515, Waiawa, Central Oahu District, Island of Oahu, Hawaii" (March 1987).

3. "Kamehameha Highway Widening, Central Oahu, Hawaii, TMK: 9-4-42,44,56 - Environmental Assessment." Highways Division, Department of Transportation, State of Hawaii.

4. "Kamehameha Highway Widening, Lumiaina Street to Waipio Uka Street, Ewa, Hawaii - Negative Declaration." Highways Division, Department of Transportation, State of Hawaii (May 1992).

5. "Oahu Water Plan." Board of Water Supply, City and County of Honolulu (July 1982).

6. "Rainfall Atlas of Hawaii." State of Hawaii, Department of Land and Natural Resources.

7. "Soil survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii." U.S. Department of Agriculture, Soil Conservation Service (August 1972).

8. "Waiola Estates Subdivision Final Environmental Impact Statement." City and County of Honolulu, Department of Housing and Community Development (Sept. 1986).

APPENDIX A

WATER USE PERMITS

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

October 19, 1994

Fax to :
Suzette Hokama
GMP
538 3269

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

Department of Hawaiian Home Lands
Application for Water Use Permit
Waipahu Wells III (Well Nos. 2400-09 to 13)
Waipahu-Waiawa Ground Water Management Area, Oahu

Applicant:

Dept. of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Landowner:

Castle & Cooke Homes, Inc.
P.O. Box 2780
Honolulu, HI 96803

Background

The Department of Hawaiian Home Lands (DHHL) filed an application for water use permit on August 16, 1994 to transfer a portion of the 1.724 million gallons per day (mgd) of ground water reserved from state lands in the Waipahu-Waiawa Aquifer System for use in the Papakolea, Nanakuli, and Waianae-Lualualei Hawaiian homestead areas by HAR 13-171-61.

The water is to be supplied by the Waipahu III Wells (Well Nos. 2400-09 to 13). A combined well construction/pump installation permit was issued to the Honolulu Board of Water Supply (BWS) on December 29, 1993 to construct, test, and install 1,000 gpm capacity pumps in up to five Waipahu III Wells. A well completion report and pump test data have been received for Well No. 2400-09, and construction of the remaining wells is currently underway.

Specific information regarding the proposed source, use, notification, objections, and field investigation(s) are described in Attachment A and the attached exhibits.

Analysis & Issues

By letter agreement dated July 22, 1994, use of this BWS source by DHHL is conditioned on a confirmation from the Commission that the water use permit be transferred to BWS once all other terms of the agreement have been met. The water will be used to supply the municipal needs of the Princess Kahanu Estates. The location of this DHHL development is consistent with homestead areas identified in HAR 13-171-61 and is also consistent with the justification provided by DHHL for the reserved quantity.

Development of Hawaiian homestead areas is in the public interest, as evidenced by the approval of DHHL's petition for reservation and the creation of Rule 13-171-61. Demand projections were made in accordance with the guideline developed by the county and used by the Commission for determination of reasonable use quantities. DHHL is afforded exemption from county zoning requirements. No objections or concerns have been raised to this proposed permit.

p.1

AGENDA 1
ITEM 6

Chairperson and Members
Commission on Water Resource Management

Minutes of
October 19, 1994

All written testimonies submitted at the meeting are filed in the Commission office and are available for review by interested parties.

AGENDA 1
ITEM 1 MINUTES OF THE SEPTEMBER 15 AND 28, 1994 MEETINGS

Unanimously approved (Nobriga/Ing).

ITEM 2 OLD BUSINESS/ANNOUNCEMENTS

None.

ITEM 3 DEPARTMENT OF TRANSPORTATION, APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, BRIDGE WIDENING AND CULVERT CROSSING, PIIKEA STREAM, KAU, HAWAII

Unanimously approved (Girald/Nobriga).

ITEM 4 DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, INSTALLATION OF A SEWER CROSSING, WAIAKEA STREAM, HILO, HAWAII

Unanimously approved (Ing/Sybinsky).

ITEM 5 ITT SHERATON HOTELS, KYO-YA CO., LTD., APPLICATION FOR A WATER USE PERMIT, KOKUSAI KOGYO WELL (WELL NO. 1749-19), PALOLO GROUND WATER MANAGEMENT AREA, OAHU

The representative from the Board of Water Supply said they did not have any objections to the staff recommendations.

Mr. Marty Heede, representing ITT Sheraton Hotels, asked if the matter could be worked out administratively rather than going into a public hearing.

Unanimously approved the staff's recommendations to initiate public hearing proceedings (Ing/Sybinsky).

ITEM 6 DEPARTMENT OF HAWAIIAN HOMES LANDS, APPLICATION FOR WATER USE PERMIT, WAIPAHU WELLS III (WELL NOS. 2400-09 TO 13), WAIPAHU-WAIAWA GROUND WATER MANAGEMENT AREA, OAHU)

Unanimously approved (Nobriga/Girald).

ITEM 7 DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT, APPLICATIONS FOR WELL CONSTRUCTION AND WATER USE PERMITS, KUNIA WELLS III (WELL NOS. 2301-40 TO 42), WAIPAHU-WAIAWA GROUND WATER MANAGEMENT AREA, OAHU

Ms. Nakama added the following recommendation:

Chairperson and Members
Commission on Water Resource Management

October 19, 1994

STANDARD WATER USE PERMIT CONDITIONS

1. The ground water described in the water use permit may only be taken from the location described, used for the reasonable-beneficial use described, and at the location described above and in the attachments. Reasonable-beneficial use means "the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is not wasteful and is both reasonable and consistent with the state and county land use plans and the public interest." (HAR §13-171-2).

2. The right to use ground water is a shared use right.

3. The water use must at all times meet the requirements set forth in HAR §13-171-13 which means that it:

   a. Can be accommodated with the available water source;
   b. Is a reasonable-beneficial use as defined in section §13-171-2;
   c. Will not interfere with any existing legal use of water;
   d. Is consistent with the public interest;
   e. Is consistent with state and county general plans and land use designations;
   f. Is consistent with county land use plans and policies; and
   g. Will not interfere with the rights of the Department of Hawaiian Home Lands as provided in section 221 of the Hawaiian Homes Commission Act and 174C-101(a), HRS.

4. The ground water use approved must not interfere with surface or ground water rights or reservations.

5. The ground water use approved must not interfere with interim or permanent instream flow standards or policies as determined by the Commission. If it does, then:

   a. A separate water use permit for surface water must be obtained in the case an area is also designated as a surface water management area;
   b. The interim or permanent instream flow standard, as applicable, must be amended.

6. The water use permit is subject to the requirements of the Hawaiian Homes Commission Act, as amended, if applicable.

7. The water use permit application and staff submittal approved by the Commission at its October 19, 1994 meeting are incorporated into the permit by reference.

8. Any modification of the permit terms, conditions, or uses can only be made with the express written consent of the Commission on Water Resource Management.

9. The water use permit may be modified by the Commission and the amount of water initially granted to the permittee may be reduced if the Commission determines it is necessary to:

   a. Protect water sources in quantity, quality, or both;
   b. Meet other legal obligations including other correlative rights;
   c. Insure adequate conservation measures;
   d. Require efficiency of water uses;
   e. Reserve water for future uses, provided that all legal existing uses of water as of June 1987, shall be protected;
   f. Meet legal obligations to the Department of Hawaiian Homes, if applicable; or
   g. Carry out such other necessary and proper exercise of the State's and the Commissions's police powers under law as may be required.

September 16, 1994

Mr. Keith Ahue, Chairperson
Commission on Water Resource
Management
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ahue:

Subject: Your Letter of August 29, 1994 Regarding Department of Hawaiian Home Lands' (DHHL) Application for a Water Use Permit for Waipahu Wells III (2400-09 to 13)

Thank you for the opportunity to comment on this application which is a transfer of allocation to us from DHHL. We request favorable action on this application.

If you have any questions, please contact Herbert Minakami at 527-6183.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

CL:do
cc: K. Hayashida, C. Lao

94-2362

942362

K.W. Mgr
AUG 31 1994
FE

RECEIVED
BD OF WATER SUPPLY
AUG 3 12 22 PM '94

JOHN WAIHEE
GOVERNOR OF HAWAII

KEITH W. AHUE
CHAIRPERSON

DR. PETER SYBINSKY
ROBERT S. NAKATA
J. DOUGLAS ING, ESQ.
ROBERT G. GIRALD
DAVID NOBRIGA

RAE M. LOUI, P.E.
DEPUTY

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

REF:WRM:SS

AUG 29 1994

TO: Dr. Peter A. Sybinsky, Director
Department of Health

Clayton H. W. Hee, Chairperson
Office of Hawaiian Affairs

✓Kazu Hayashida, Manager & Chief Engineer
Honolulu Board of Water Supply

Donald A. Clegg, Director
Department of Land Utilization

Robin Foster, Chief Planning Officer
Planning Department

FROM: Keith W. Ahue, Chairperson
Commission on Water Resource Management

SUBJECT: Water Use Permit Application
Waipahu-Waiawa Ground Water Management Area, Oahu

Transmitted for your review and comment is a copy of a water use permit application for the Department of Hawaiian Home Lands for Well Nos. 2400-09 to 13. Public notice of this application will be published in the Honolulu Star Bulletin issues of September 6, 1994 and September 13, 1994.

We would appreciate your review of the attached application for any conflicts or inconsistencies with the programs, plans, or objectives specific to your organization or department only. Please return this cover memo form by September 27, 1994.

If you have any questions regarding this application, please contact Lenore Nakama at 587-0218.

Attachment(s)

Response:

( ) We have no comments
(X) We have no objections
( ) Comments attached
( ) Additional information requested
( ) Extended review period requested

Contact person: Herbert H. Minakami Phone: 527-6183

Signed: Kazu Hayashida Date: 9/16/94
KAZU HAYASHIDA
Manager and Chief Engineer

JOHN WAIHEE
GOVERNOR
TATE OF HAWAII

HOALIKU L. DRAKE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

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

AUGUST 12, 1994

TO: The Honorable Keith W. Ahue, Chairperson
Department of Land and Natural Resources
Commission on Water Resource Management

FROM: Hoaliku L. Drake, Chairman
Hawaiian Homes Commission

SUBJECT: Request to Transfer Water Allocation,
Princess Kahanu Estates, Lualualei, Oahu

RECEIVED
94 AUG 16 AM 8:58
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Thank you for your correspondence dated July 19, 1994, regarding our request to transfer water allocation from the Department of Hawaiian Home Lands to the Honolulu Board of Water Supply for the Princess Kahanu Estates subdivision. While our amended request dated July 7, 1994 identified a transfer of 143,000 gallons per day, we were informed by the Board of Water Supply that 143,500 gallons would be necessary. Their letter of July 22, 1994 is attached. Our water use permit application which is also attached reflects this change.

We are aware that the process for review and consideration of our request takes approximately three months. Your assistance to expedite the review period will be appreciated. Currently, five model homes are under construction and the mass building of homes will start in October. We are hopeful that the first homeowners can move into their homes by January 1994.

Should you have any questions, please call me at 586-3800 or your staff may call Stewart Matsunaga, Land Development Division, at 586-3844.

RECEIVED
94 AUG 15 P 3:47
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

HLD:sm:5659B

Attachment

CC:Kazu Hayashida, Board of Water Supply
Craig Watase, Princess Kahanu Development Corporation

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

July 22, 1994

Mr. Mark H. Tagami
Calvin Kim & Associates, Inc.
1050 Queen Street, Suite 300
Honolulu, Hawaii 96814

Dear Mr. Tagami:

Subject: Your Letter of July 8, 1994 Regarding the Proposed Princess Kahanu Estates Subdivision, TMK: 8-7-07: 4, 8-7-33: 14 & 19

Thank you for your letter regarding the proposed development. We have the following comments on the Princess Kahanu Estates water master plan and water demand calculations:

1. The total water requirements should be 143,500 gallons per day.

2. The Department of Hawaiian Home Lands (DHHL) is required to:

   a. Confirm that the State Commission on Water Resource Management will approve the assignment transfer of permitted use from DHHL to the Board of Water Supply.

   b. Pay a proportionate share of our Waipahu Wells III project. The current estimated cost is $3.60 per gallon. The final cost will be established when we complete construction of the project.

   c. Pay a proportionate share of our proposed Nanakuli 242-foot Reservoir. The current estimated storage cost for the proposed reservoir is $4.20 per gallon.

   d. Pay our Water System Facilities Charges for transmission.

   e. Submit construction drawings for our review and approval.

The availability of water will be confirmed when the construction drawings are submitted for our review and approval.

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

Very truly yours,

Raymond S. Sato

FOR KAZU HAYASHIDA
Manager and Chief Engineer

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

RECEIVED
LAND DEVELOPMENT
DIV.
AUG 10 1 50 PM '94

AUG 10 9 01 AM '94

APPLICATION FOR WATER USE PERMIT

☒ Ground Water or ☐ Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225 (neighbor islands, 1-800-468-4644).

PERMITTEE INFORMATION

1. (a) APPLICANT

Firm/Name Dept. of Hawaiian Home Lands
Contact Person Stewart Matsunaga Ph. 586-3845
Address P.O. Box 1879
Honolulu, HI 96805

(b) LANDOWNER OF SOURCE

Firm/Name Castle & Cooke Homes, Inc.
Contact Person Wally Miyahira Ph. 548-4811
Address P.O. Box 2780
Honolulu, HI 96803

SOURCE INFORMATION

2. WATER MANAGEMENT AREA: Pearl Harbor WAIPAHU-WAIANAE ISLAND: Oahu
3. (a) EXISTING WELL/DIVERSION NAME AND STATE NUMBER: ~~Waipahu III 2400-07,08,09,10&11~~
   (b) PROPOSED (NEW) WELL/DIVERSION NAME: WAIPAHU III 2400-09 to 13
   (c) LOCATION: Address Waipahu Tax Map Key 9-4-05: 74
   (Attach a USGS map, scale 1"=2000', and a property tax map showing source location referenced to established property boundaries.)
4. SOURCE TYPE (check one): ☐ Stream ☒ Basal ☐ Dike-confined ☐ Perched ☐ Caprock
5. METHOD OF TAKING WATER (check one): ☐ Artesian ☒ Well & Pump ☐ Diverted Surface ☐ Other (explain)

USE INFORMATION

6. LOCATION OF PROPOSED WATER USE: (If possible, show on same maps as source location. Otherwise, attach similar maps)
   (a) Proposed use of water is: ☐ Existing ☒ New ☐ Both existing & new uses
   (b) Tax Map Key: 8-7-07:04 (If location of use is over multiple TMKs, please complete Table 1 on back of application)
   (c) Address: Princess Kahanu Estates
   (d) Current Land Use District: ☒ Urban ☐ Agriculture ☐ Conservation ☐ Rural
   (e) Current County Zoning Code: R-5, PD-H, P-2
7. QUANTITY OF WATER REQUESTED: ~~143,000~~ 143,500 gallons per day (averaged over 1 year)
8. METHOD OF MEASUREMENT: ☒ Flowmeter ☐ Open-pipe ☐ Weir ☐ Orifice ☐ Other (explain)
9. QUALITY OF WATER REQUESTED: ☐ Fresh ☐ Brackish ☐ Salt ☒ Potable ☐ Non-Potable
10. PROPOSED USE: ☒ Municipal (including hotels, stores, etc.) ☐ Individual Domestic ☐ Irrigation ☐ Industrial ☐ Military ☐ Other (explain)

For questions 12 & 13: If multiple TMKs are involved, please complete Table 1 on back of application.

11. TOTAL NUMBER OF RESIDENCES TO BE SERVED: 271 single-family homes
12. TOTAL ACRES TO BE IRRIGATED AND TYPE OF CROP: N/A (acres) (crop)
13. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 24 hours/day (daytime hours of operation, ex. 7 a.m. to 2 p.m.)
14. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON WATER USE:
   (a) Impact on Sustainable yield (?): It is a part of potable water released by reduction in pumpage by Oahu Sugar.
   (b) Instream Flow Standards affected (?): none
   (c) Hawaiian Home Lands use affected (?): The project will be occupied by DHHL lessees.
   (d) Other existing legal uses affected (?): none
   (e) Other (pending permits, EIS, etc.)(?): none
15. REMARKS, EXPLANATIONS: (see reverse)

(If more space is needed, continue on back side)

NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior existing permitted uses, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands future uses. In addition, applies understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

Applicant (print) for Hoaliku L. Drake, Chairman Hawaiian Homes Commission
Signature
Date 8/4/94

Landowner (print) Castle & Cooke Homes, Hawai
Signature
Date August 9, 1994

For Official Use Only:
Date Received
Date Accepted
Hydrologic Unit No.
Diversion Works No.
State Well No. 2400-09 to 1

6/19/93 WUPA Fo

16. REMARKS, EXPLANATIONS (cont'd):

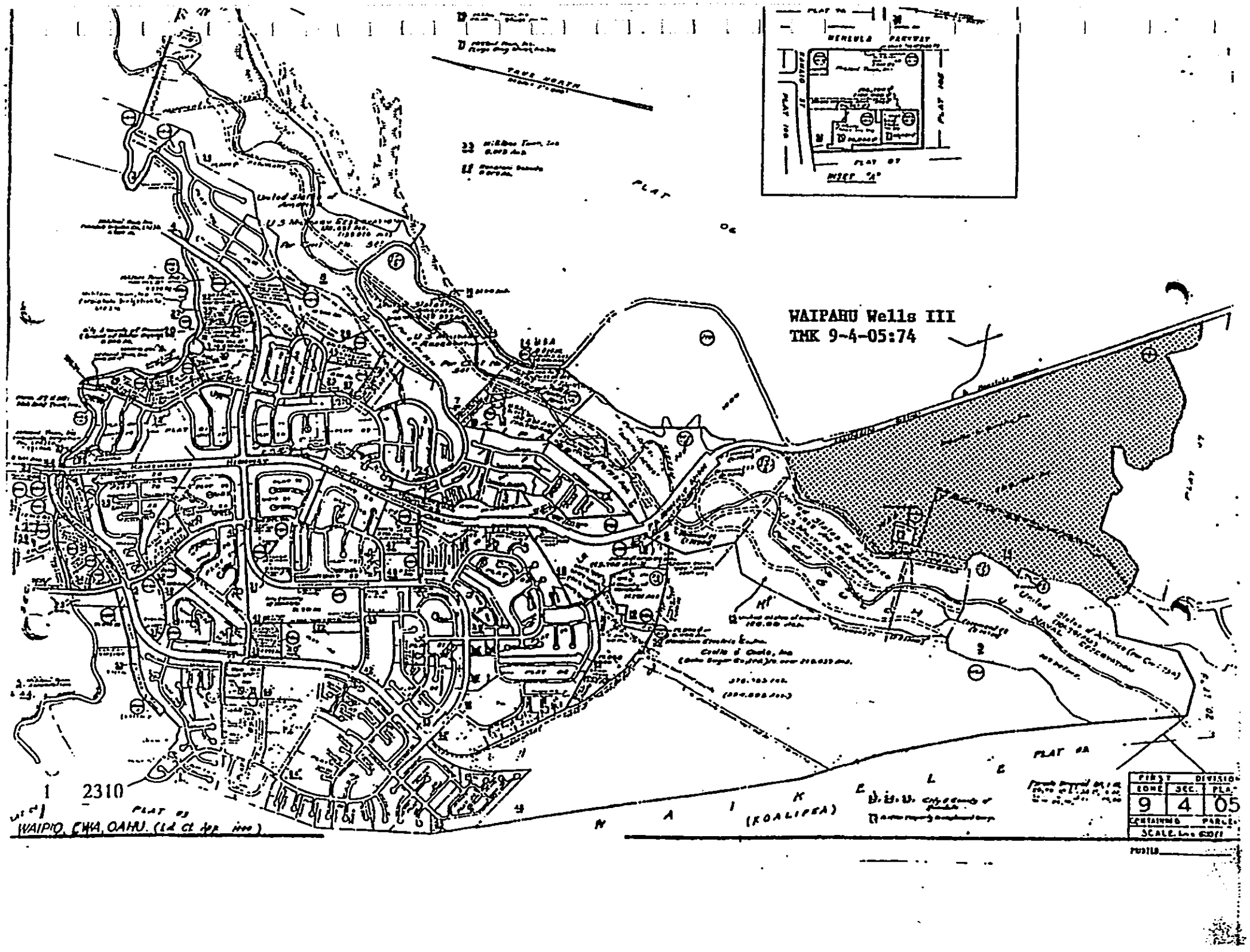
The water requested is a portion of the 1.724 million gallons of potable water reserved for DHHL by Water Commission Administrative Rule 13-171-61 (October, 1993).

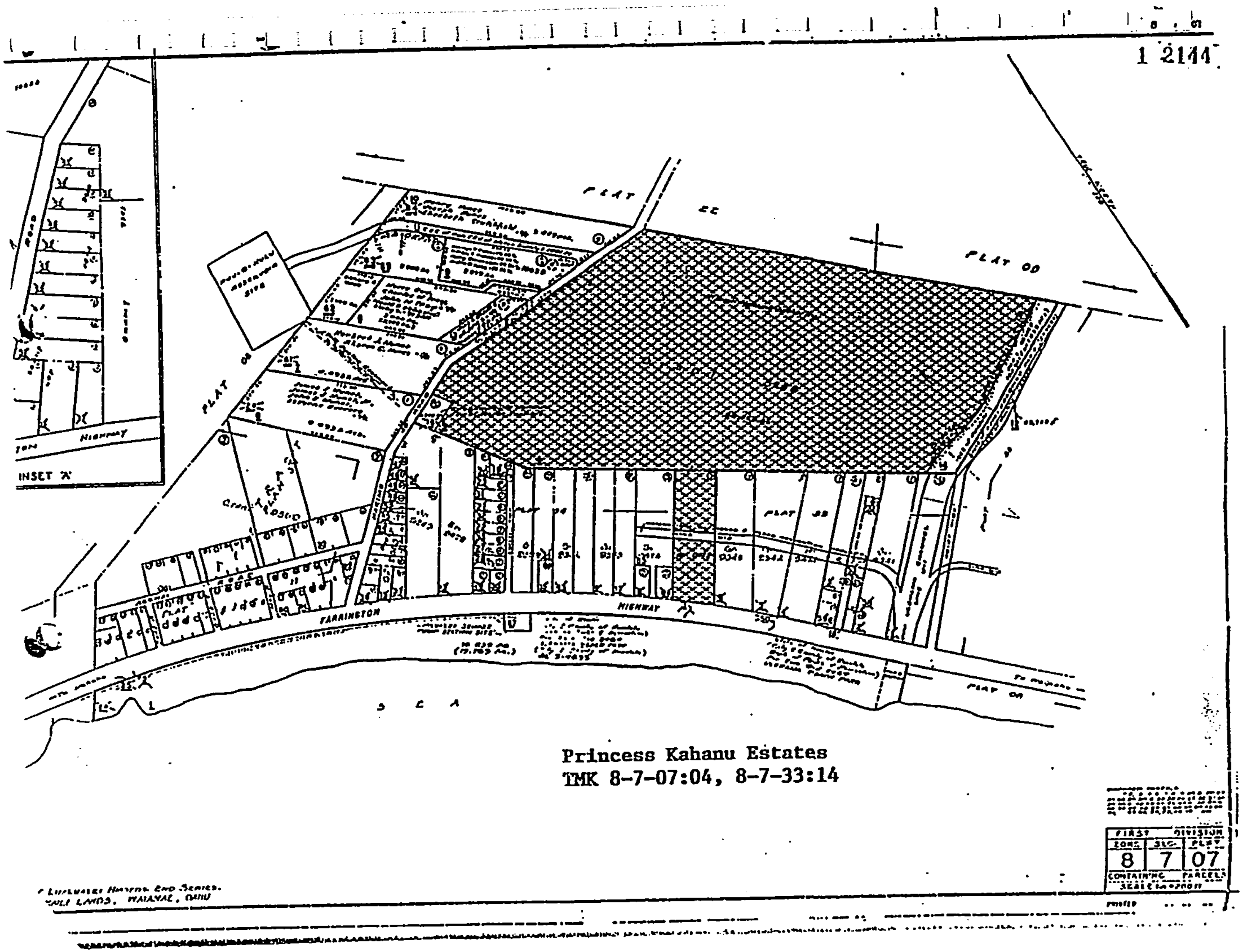
DHHL is exempting itself from City & County zoning requirements.

This water use allocation is to be transferred to the Honolulu Board of Water Supply.

TABLE 1. MULTIPLE TMKs TO USE REQUESTED WATER

PROJECT NAME	TMK	CURRENT COUNTY ZONING CODE	UNITS or NET ACRES	GPD/UNIT or GPD/ACRE	TOTAL GPD	% OF TOTAL TO BE USED OVER NEXT 4 YEARS
Princess Kahanu Estates	8-7-07:04	R-5,PDH P-2	271 units	500	135,500	100 %
Princess Kahanu Estates	8-7-07:04	R-5,PDH P-2	1 unit - pre-schoo	7,000	7,000	100%
Princess Kahanu Estates	8-7-33-14	R-5, PDH	1 unit - Community Center	1,000	1,000	100%


WAIPAHU Wells III
TMK 9-4-05:74
1 2310
WAIPIO, EWA, OAHU.
N A I K (KOALIPEA)
FIRST DIVISION
ZONE 9
SEC. 4
PLA. 05
PARCEL
SCALE



Princess Kahanu Estates
TMK 8-7-07:04, 8-7-33:14

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

August 28, 1992

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

Attention: Ms. Rae Loui

Dear Mr. Paty:

Subject: Amendment to Our Water Use Permit Application for Proposed Waipahu III Wells

We wish to amend the subject application by adding the drilling of two new wells each equipped with a 1.5 million gallon per day (mgd) pump at the Waipahu III site. The proposed change will result in a total of five wells at the Waipahu III site. A 1.5 mgd pump will be installed at each well.

The additional wells are for peaking purposes. The "permitted Use" request from 3 mgd will remain the same.

Your assistance in amending our Water Use Permit Application to reflect the change is appreciated.

If you have any questions, please call George Hiu at 527-6134.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

APPLICATION FOR WATER USE PERMIT

☐ Ground Water or ☐ Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

1. (a) APPLICANT
Firm/Name: Board of Water Supply
Contact Person: Kazu Hayashida Ph: 527-6180
Address: 630 South Beretania Street
Honolulu, Hawaii 96843

(b) LANDOWNER
Firm/Name: Dole Food Company, Inc., fka Castle and Cooke, Inc.
Contact Person: George Yim Ph: 548-6611
Address: P.O. Box 2990
Honolulu, Hawaii 96802

2. WATER MANAGEMENT AREA: Pearl Harbor ISLAND: Oahu

3. (a) EXISTING SOURCE NAME AND STATE NUMBER: _____
(well or stream diversion name/number)
(b) PROPOSED (NEW) SOURCE NAME: Waipahu Wells III

4. SOURCE LOCATION: Address _____ Tax Map Key 9-4-5:74 ~~9-4-07: 1~~
(Attach a USGS map, scale 1"=2000', and a property tax map showing source location referenced to established property boundaries.)

5. SOURCE TYPE (check one): ☐ Stream ☒ Basal ☐ Dike-confined ☐ Perched ☐ Caprock

6. METHOD OF TAKING WATER (check one): ☐ Artesian Flow ☒ Well & Pump ☐ Diverted Surface Flow ☐ Other (explain)

7. LOCATION OF PROPOSED WATER USE: (If possible, show on same maps as source location. Otherwise, attach similar maps)
(a) Address Municipal System Tax Map Key _____
(b) Land Use District (check one): ☐ Urban ☐ Agriculture ☐ Conservation ☐ Rural
(c) County Zoning (describe) _____

8. QUANTITY OF WATER REQUESTED: 3.0 million gallons per day

9. METHOD OF MEASUREMENT: ☒ Flowmeter ☐ Open-pipe ☐ Weir ☐ Orifice ☐ Other (explain)

10. QUALITY OF WATER REQUESTED: ☒ Fresh ☐ Brackish ☐ Salt ☐ Potable ☐ Non-Potable

11. PROPOSED USE: ☒ Municipal (including hotels, stores, etc.) ☐ Domestic (individual, noncommercial, etc.) ☐ Irrigation
☐ Industrial ☐ Military ☐ Other (explain)

12. NUMBER AND TYPE OF UNITS TO BE SERVED (explain): _____

13. TOTAL ACRES PROPOSED FOR IRRIGATION AND TYPE OF CROP: _____
(acres) (crop)

14. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 24 hours
(indicate hours of operation)

15. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON USE:
(a) Impact on Sustainable yield (?): Reduce sustainable yield
(b) Permenant or Interim Instream Flow Standards affected (?): N/A
(c) Hawaiian Home Land uses affected (?): N/A
(d) Other existing legal uses affected (?): N/A
(e) Other: _____

16. REMARKS, EXPLANATIONS: Additional two wells (total of five) with capacities of 1.5 mgd each for proposed well field.
(If more space is needed, continue on back side)

NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior existing permitted uses, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands future uses. In addition, applicant understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

Applicant (print) Board of Water Supply
Signature Kazu Hayashida
Date 8/28/92

Landowner (print) Dole Food Company, Inc., fka Castle and Cooke, Inc.
Signature see earlier application
Date _____

For Official Use Only:
Date Received 8/29/92 → 9/1/92 Hydrologic Unit No. 30203 Diversion Works No. _____
Date Accepted _____ State Well No. _____

Notice Dates:
Public _____ Mayor _____ BWS _____ Mail List _____ Bulletin _____ Public Hearing _____

ATER SUPPLY
OF HONOLULU
ETANIA STREET
HAWAII 96843

August 14, 1992

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

Attention: Ms. Rae Loui

Dear Mr. Paty:

Subject: Water Use Permit Application For Proposed Waipahu III Wells

We submit our application for wells which we propose to drill and to install pumps at the location shown on the map attached to our application.

The proposed project will be constructed jointly with the State Housing Finance and Development Corporation for the State Kapolei housing development in Ewa. The Corporation indicated that they need about 2.0 million gallons per day (mgd) for their planned developments at Kapolei. We need about 1.0 mgd to handle the smaller developments that will need water in the next ~~six years~~ 4 yrs. in the Ewa area.

If you have any questions, please contact Herbert H. Minakami at 527-6183.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

APPLICATION FOR WATER USE PERMIT

☒ Ground Water or ☐ Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

1. (a) APPLICANT
Firm/Name: Board of Water Supply
Contact Person: Kazu Hayashida Ph: 527-6180
Address: 630 South Beretania St.
Honolulu, Hawaii 96843

(b) LANDOWNER
Firm/Name: Dole Food Company, Inc. fka Castle and Cooke, Inc.
Contact Person: George Yim Ph: 548-6611
Address: P. O. Box 2990
Honolulu, Hawaii 96802

2. WATER MANAGEMENT AREA: Pearl Harbor ISLAND: Oahu

(a) EXISTING SOURCE NAME AND STATE NUMBER: _____
(well or stream diversion name/number)

(b) PROPOSED (NEW) SOURCE NAME: Waipahu Wells III

4. SOURCE LOCATION: Address _____ Tax Map Key 9-4-07: 1
(Attach a USGS map, scale 1"=2000', and a property tax map showing source location referenced to established property boundaries.)

5. SOURCE TYPE (check one): ☐ Stream ☒ Basal ☐ Dike-confined ☐ Perched ☐ Caprock

6. METHOD OF TAKING WATER (check one): ☐ Artesian Flow ☒ Well & Pump ☐ Diverted Surface Flow ☐ Other (explain)

7. LOCATION OF PROPOSED WATER USE: (If possible, show on same maps as source location. Otherwise, attach similar maps)
(a) Address Municipal System Tax Map Key _____
(b) Land Use District (check one): ☐ Urban ☐ Agriculture ☐ Conservation ☐ Rural
(c) County Zoning (describe) _____

8. QUANTITY OF WATER REQUESTED: 3.0 million gallons per day

9. METHOD OF MEASUREMENT: ☒ Flowmeter ☐ Open-pipe ☐ Weir ☐ Orifice ☐ Other (explain)

10. QUALITY OF WATER REQUESTED: ☒ Fresh ☐ Brackish ☐ Salt ☐ Potable ☐ Non-Potable

11. PROPOSED USE: ☒ Municipal (including hotels, stores, etc.) ☐ Domestic (individual, noncommercial, etc.) ☐ Irrigation ☐ Industrial ☐ Military ☐ Other (explain)

12. NUMBER AND TYPE OF UNITS TO BE SERVED (explain): _____

13. TOTAL ACRES PROPOSED FOR IRRIGATION AND TYPE OF CROP: _____
(acres) (crop)

14. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 24 hours
(indicate hours of operation)

15. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON USE:
(a) Impact on Sustainable yield (?): Reduction of available sustainable yield.
(b) Permenant or Interim Instream Flow Standards affected (?): n/a
(c) Hawaiian Home Land uses affected (?): n/a
(d) Other existing legal uses affected (?): n/a
(e) Other: _____

16. REMARKS, EXPLANATIONS: Construct new wellfield of three wells with capacities of 1.5 MGD each.

(If more space is needed, continue on back side)

NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior existing permitted uses, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands future uses. In addition, applicant understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

Applicant (print) Board of Water Supply
Signature _____
Date AUG 10 1992

Landowner (print) Dole Food Company, Inc. fka Castle and Cooke, Inc.
By Its Agent, Castle & Cooke Land Company
Signature _____
Date 8/13/92

For Official Use Only:
Date Received 08/14/92 & 8/11/92 Hydrologic Unit No. 30203 Diversion Works No. _____
Date Accepted _____ State Well No. _____

Notice Dates:
Public _____ Mayor _____ BWS _____ Mail List _____ Bulletin _____ Public Hearing _____

6/24/92 WUPA Form

459-22-30

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

APPLICATION FOR PERMIT

☒ Well Construction or ☐ Pump Installation

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

1. APPLICANT: (may be a, b, or c, but all must be filled in)

(a) WELL OWNER

Firm/Name Board of Water Supply
Contact Person Kazu Hayashida Ph: 527-6180
Address 630 S. Beretania Street
Honolulu, Hawaii 96843

(b) LANDOWNER

Firm/Name Same
Contact Person _____ Ph: _____
Address _____

(c) CONTRACTOR

Firm/Name To be determined Ph: _____ Contractor's C-57 License No. _____
Address _____

2. WELL LOCATION/NAME: Waipahu III Island Oahu
Address _____ Tax Map Key 9-4-5:74

(Attach a USGS map, scale 1"=2000', and a property tax map showing well location referenced to established property boundaries.)

3. (a) PROPOSED WORK: ☒ Drill New Well ☐ * Alter Location
☐ Modify Existing Well ☐ Redrill ☐ Deepen ☐ * Abandon/Seal
☐ Install New Pump ☐ Replace Pump ☐ Modify Pump
* Be sure to complete and submit well abandonment report upon completion of work.

(b) WELL TYPE: ☐ Dug ☐ Bored ☐ Driven ☒ Drilled ☐ Radial
Is this well a part of a battery of wells? ☐ Yes ☐ No
(Briefly describe and fill in the diagram on the back of this form.)

4. PROPOSED PUMP INFORMATION: Rated Pump Capacity: 1,000 gallons per minute

Pump Type:
☒ Deep Well Turbine ☐ Rotary ☐ Propeller
☐ Submersible ☐ Rotary-Displacement ☐ Reciprocating
☐ Centrifugal ☐ Rotary-Gear ☐ Impulse

Motor:
☐ Diesel
☐ Gas
☐ Electric, rated horsepower of _____

5. PROPOSED USE: ☒ Municipal (including hotels, stores, etc.) ☐ Military
☐ Domestic (individual, noncommercial water sys.) ☐ Industrial
☐ Irrigation (crop) _____ ☐ Other (explain)
State Land Use District: ☐ Urban ☐ Agriculture ☐ Rural ☐ Conservation
County Zoning (describe) _____
(If more space is needed, continue below under remarks, explanations.)

6. (a) PROPOSED AMOUNT OF WITHDRAWAL: 3 Million gallons per day
(b) METHOD OF FLOW MEASUREMENT: ☐ Flow-meter ☐ Open-pipe ☐ Orifice Plate ☐ Weir

7. PENDING ACTIONS: ☐ CDUA ☐ SMA ☐ EIS ☐ EA ☐ NONE ☐ Other(explain)

8. REMARKS, EXPLANATIONS: Drill up to 5 wells

(If more space is needed, continue on back)

By signing below indicates that the applicant understands that, if the permit requested is granted by the Commission on Water Resource Management, the proposed work is to be completed within two (2) years of the approval date. In addition, the contractor shall submit to the Commission a well completion report, well abandonment report, or both, within 30 days after the completion date of the permitted work. The applicant also understands that monthly water use data shall be submitted to the Commission. The applicant further understands that approval of the proposed permit shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner Board of Water Supply Landowner (Same) Contractor

Signature [signature] Signature _____ Signature _____
Date 6/9/93 Date _____ Date _____

For Official Use Only:
Date Received _____
Date Accepted _____
Field Checked By _____
Date _____

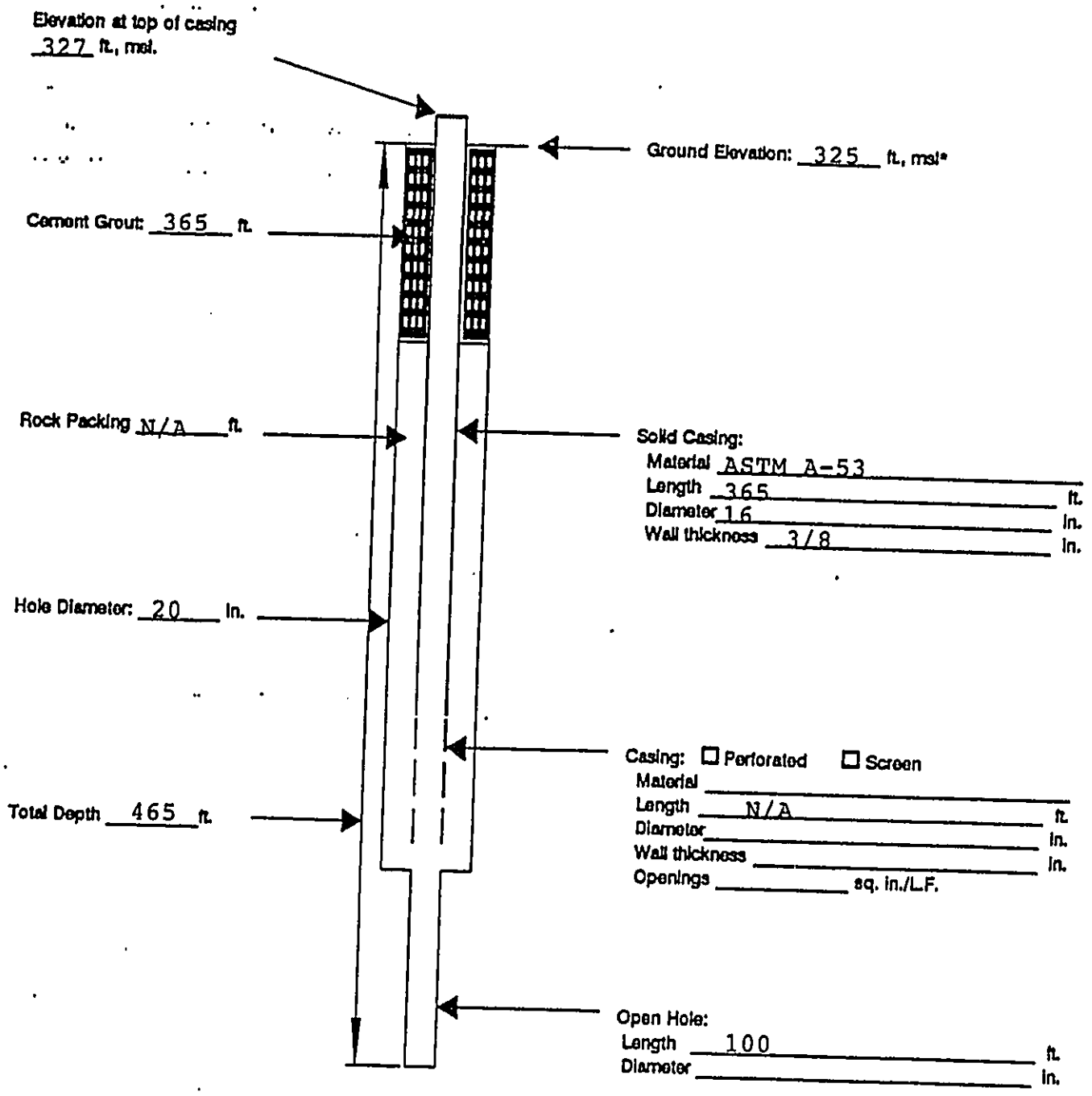
Longitude _____
Latitude _____

Aquifer System Name _____
State Well No. _____

6/24/92 WCPI Form

emarks, Explainations (cont'd): Drill up to 5 wells for HFDC for permitted use of 2,013,700 gpd and for peaking and stand by purposes.

9. PROPOSED WELL SECTION



Approximate elevation at time of filing application. Ground elevation above mean sea level (msl) by a surveyor licensed by the State must be submitted at tart of construction. Final elevations of well components shall be submitted in the well completion/well abandonment reports.

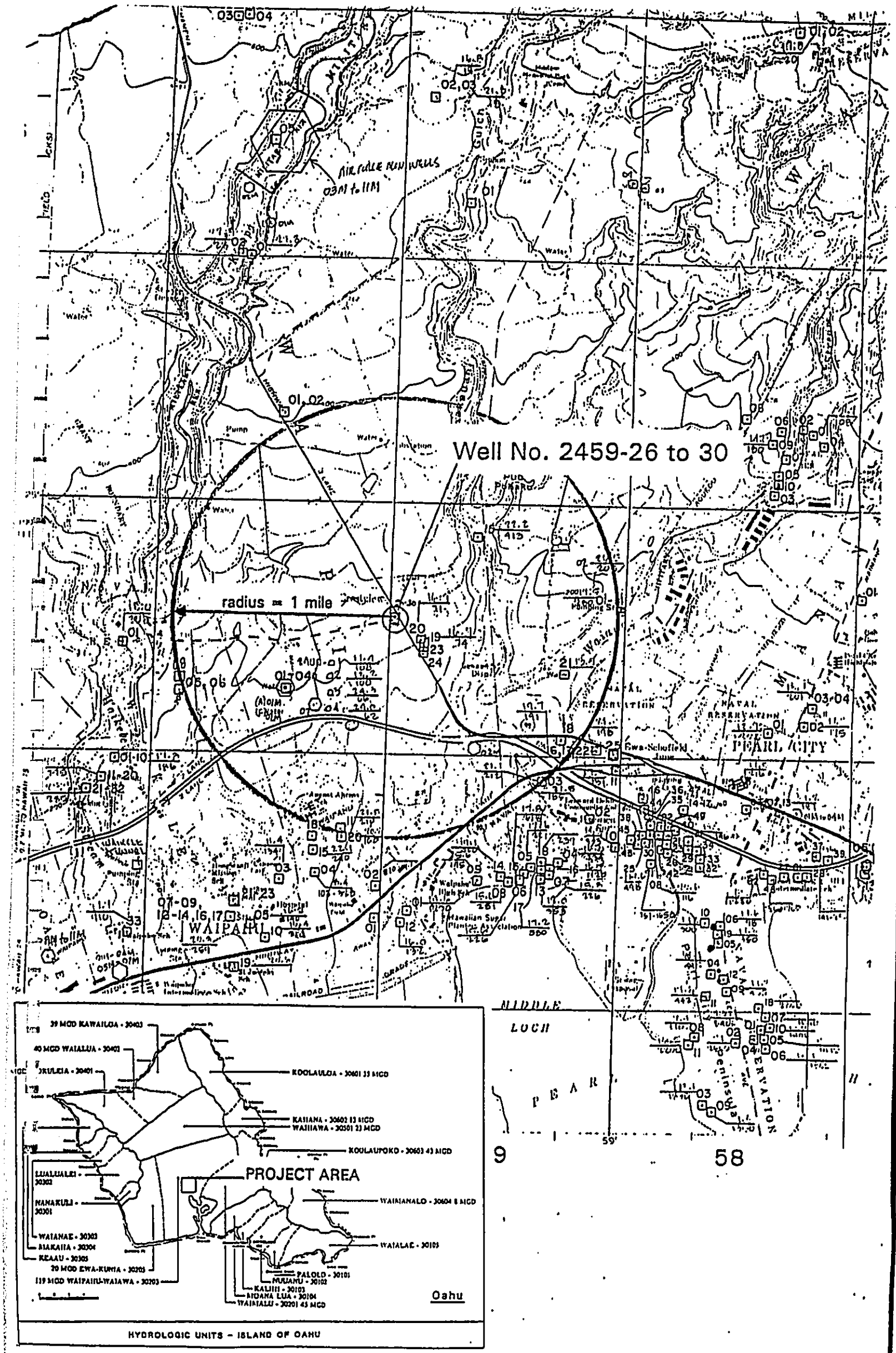

Well No. 2459-26 to 30
radius = 1 mile
PROJECT AREA
WAIPAHU
PEARL CITY
MIDDLE LOCH
PEARL HARBOR
39 MGD KAWAILOA - 30403
40 MGD WAIALUA - 30402
KOOLAULOA - 30601 33 MGD
KAIAWA - 30602 13 MGD
WAIHAWA - 30501 23 MGD
KOOLAUPOKO - 30603 43 MGD
LUALUALEI - 30302
NANAKULI - 30301
WAIANAE - 30303
MAKAHA - 30304
KEAAU - 30305
20 MGD EWA-KUNIA - 30205
139 MGD WAIPAHU-WAIAWA - 30203
WAIMANALO - 30604 8 MGD
WAIALAE - 30103
PALOLO - 30101
MOANUA - 30102
KALIHI - 30103
MOANA LUA - 30104
WAIHALU - 30201 45 MGD
Oahu
HYDROLOGIC UNITS – ISLAND OF OAHU

Exhibit 1

APPENDIX B

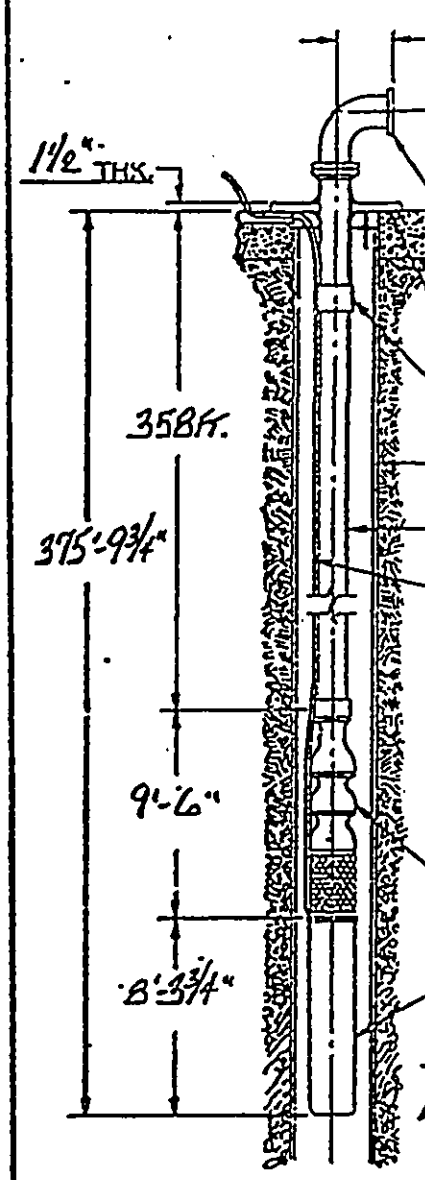
SUBMERSIBLE PUMPS

Wapi Pasha Well No. 3 — GMP ASSOCIATES

SUBMERSIBLE PUMP

MODEL: 12 MQ

FABRICATED STL. SURFACE PLATE



BOWL UNIT:

12MQ ASSEMBLY

7 STAGE

12 1/8" O.D. OF BOWL UNIT INCL. CABLE GUARD

MOTOR: Byron Jackson MFG. 11 5/8" O.D.

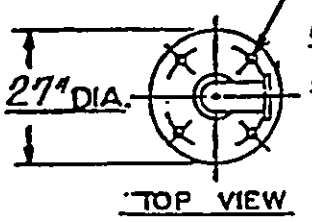
150 H.P. 60 CY. 480 VOLTS

1800 R.P.M. 3 PH. FRAME

PUMP RATING

G.P.M. 1000

FT. FIELD HD. 470



TOP VIEW

S.O. NO.

SOLD TO:

ORDER NO.

USER

ITEM NO.

PUMP IDENTIFICATION

THIS CERTIFIED PRINT

☐ FOR APPROVAL

BY GRD DATE 9-29-94

☐ FOR CONSTRUCTION

BY _____ DATE _____

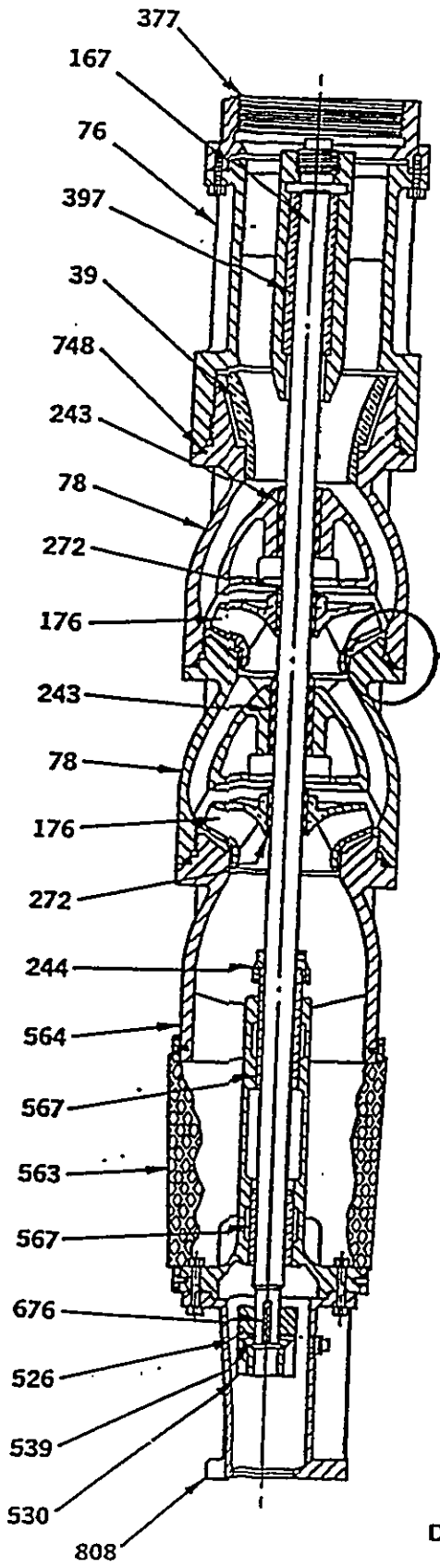
PRELIMINARY - FOR BUDGET QUOTE ONLY

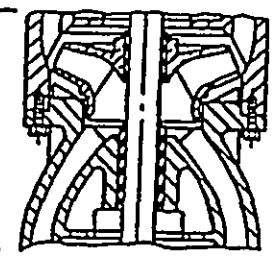
DRN. BY: _____ CHK'D BY: _____ DATE: _____

PUMP NO. _____

TYPE MQ SUBMERSIBLE BOWL ASSEMBLIES

Sectional Drawing for ~~11MQ, 11MQ~~, 12MQ, ~~13MQ, 15MQ and 17MQ~~





Flanged Bowls
(13MQ, 15MQ and 17MQ)

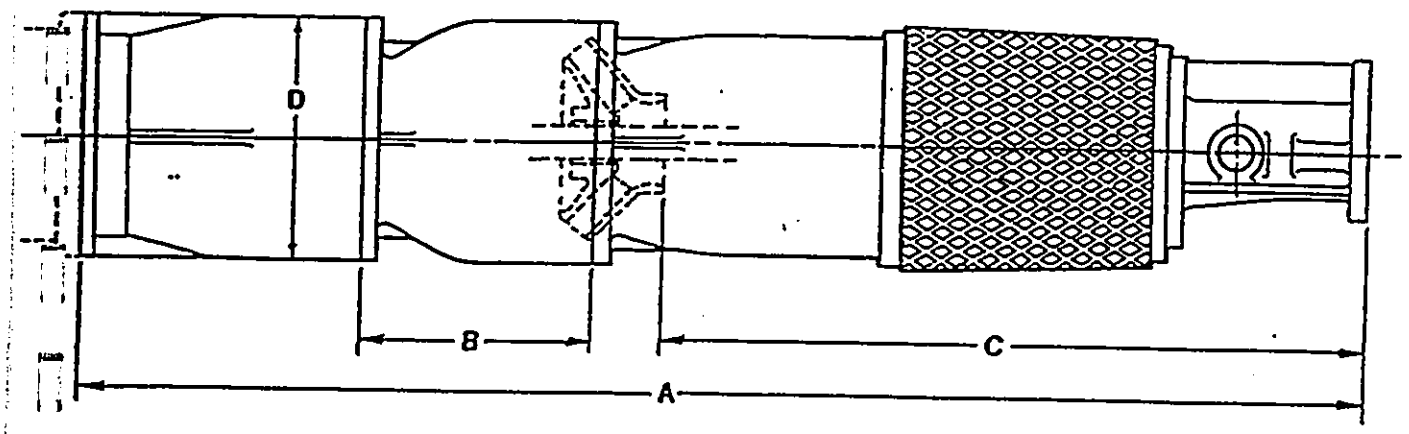
ITEM NO.	PART NAME
39	Flow Adapter
76	Top Case
78	Series Case
¢167	Pump Shaft
176	Impeller Ni-ALUM BRZ.
¢243	Bearing-Series Case
244	Sand Cap
¢272	Collet-Impeller Lock
377	Flange-Top Case
¢397	Bearing-Top Case
¢398	Bearing-Top Series Case
¢526	Retainer Ring
530	Coupling-Pump Half
¢539	Pin-Pump Half Coupling
563	Strainer Screen
564	Strain Body
¢567	Bearing-Strainer Body
¢676	Key-Coupling
¢748	'O' RING GASKET
808	Adapter

¢RECOMMENDED SPARE PARTS

WHEN ORDERING PARTS REFER TO:
1. PUMP NO._____
2. DWG. NO. 265874-2
3. PART NAME & ITEM .NO.

Drawing 265874-2

TYPE "MQ" SUBMERSIBLE BOWL ASSEMBLIES



Lengths Apply to Standard or Heavy Construction.

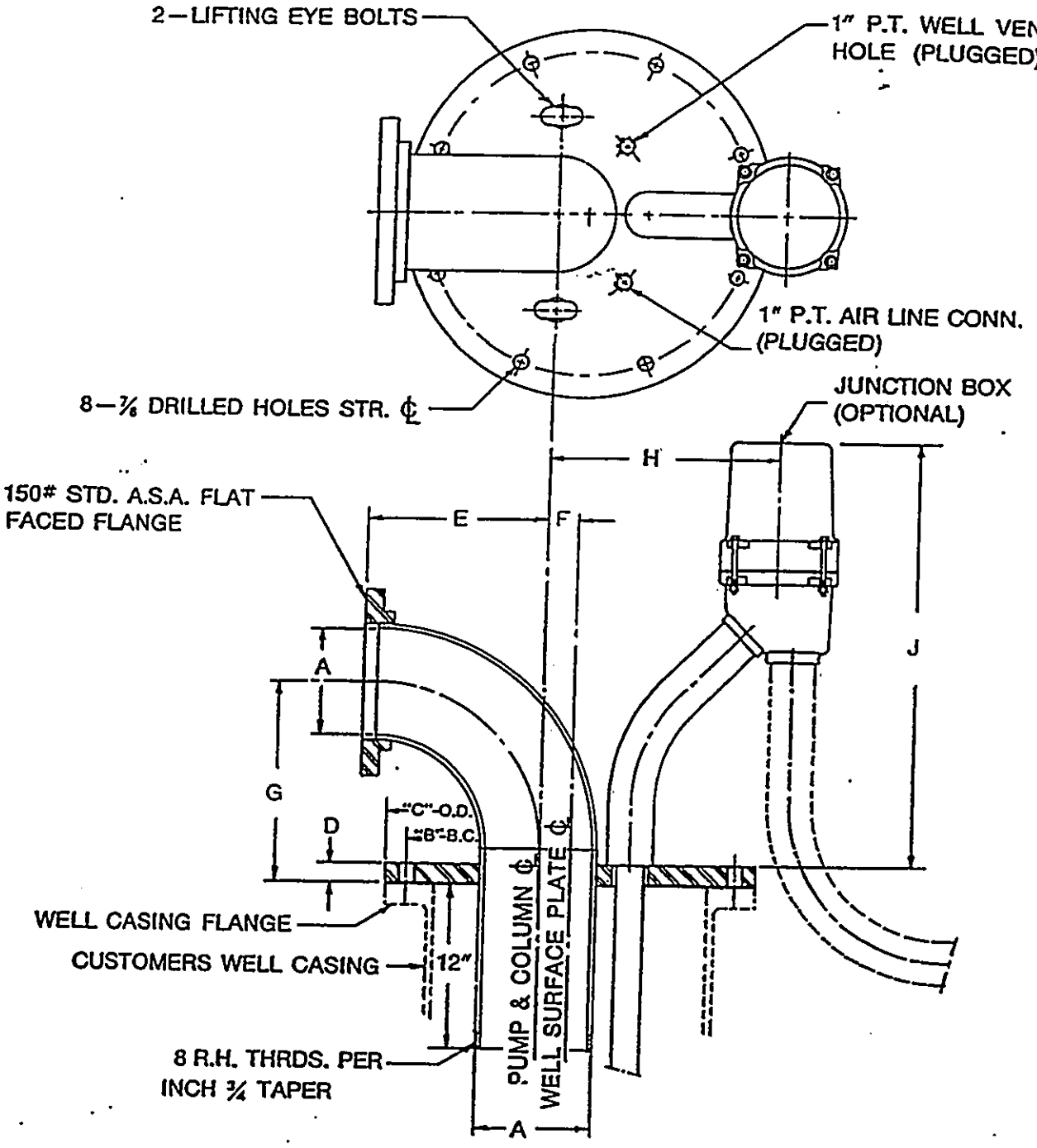
PUMP SIZE	SUBM. MOTOR SIZE	SUBM. MOTOR SPEED 2P	SUBM. MOTOR SPEED 4P	STRAINER SIZE	A (2)LENGTH OF ONE STG. UNIT	B LENGTH OF ADD'L STG.	C FIRST STAGE IMP.LOCATION	D	AVAILABLE TOP CASE OUTLET SIZES	WELL I.D. MIN.	WELL I.D. RECOM'ED
7-MQ	8	✓	✓	8	29 1/8	7 1/16	15 3/8	6 3/4	5	8½	10
	10	✓	✓		32 15/16		18 15/16			10	12
8-MQ	8	✓	✓	8	33 1/16	8	20 25/32	7 3/4	5 & 6	8½	10
	10	✓	✓		34 1/8		21 25/32			10	12
10-MQ	10	✓	✓	10	41 13/16	9½	23 1/16	9½	6, 8	12	12
	12	✓	✓		42 3/4		24 1/8				
	14		✓		45 7/16		26 13/16			14	16
11-MQ	10	✓	✓	12	48 3/4	10 3/4		10 3/4	8	12	13.5
	12	✓	✓		51 5/16		26 3/16				
	14		✓		52 1/4		29 11/16			14	16
12-MQ	10		✓	12	54 1/4	12		11¼	8, 10	13	15
	12		✓		53 13/16		26 3/16				
	14		✓		54 3/4		29 11/16			14	16
13-MQ	12		✓	14	54 7/8	12 7/8		13	10	14	16
	14		✓		52 5/16		28 1/4				
	17		✓		55 13/16		32 3/16			15¼	17
15-MQ	12		✓	15	67 7/16	14 7/16		14 7/16	10, 12	15½	17 7/8
	14		✓		65 1/8		38 1/8				
	17		✓		66 11/16		39 7/16				
17-MQ	17		✓	15	70 1/8	16¼	37 13/16	16 7/8	10, 12	17 7/8	19¼
	18		✓		71 3/16		38 7/8				
	21		✓								
20-MQ	17		✓	18	82 9/16	19 5/8	46 11/16	20	12, 16, 20	21	23
	18		✓		83 1/8		47¼				
	21		✓								

Flanged Bowls.

Length of one stage assembly may vary slightly with 2 Pole Speed Motor if critical, contact Tulsa Engineered Products Department for exact dimension.

SUBMERSIBLE — BASIC SURFACE PLATE SELECTION CHART

WITH OPTIONAL JUNCTION BOX



A COL. SIZE	WELL I.D. ACCOMMODATION	B	C	D	E	F	G	H	J	MAX. SETTING	MAX. LOAD
4	8-19	22	24	1¼	6¼	1	8	15½	28	1000	21,000
5	10-19	22	24	1¼	8¼	1	9½	16	28	1000	31,000
8	14-22	25	27	1½	13	1¼	14	17 13/16	33	800	55,000
12	19-26	29	31	1¾	19	1¼	20¼	19 7/8	33	700	100,000

4 POLE SUBMERSIBLE MOTORS

TECHNICAL DATA

1800 RPM — 3 PHASE — 60 HERTZ

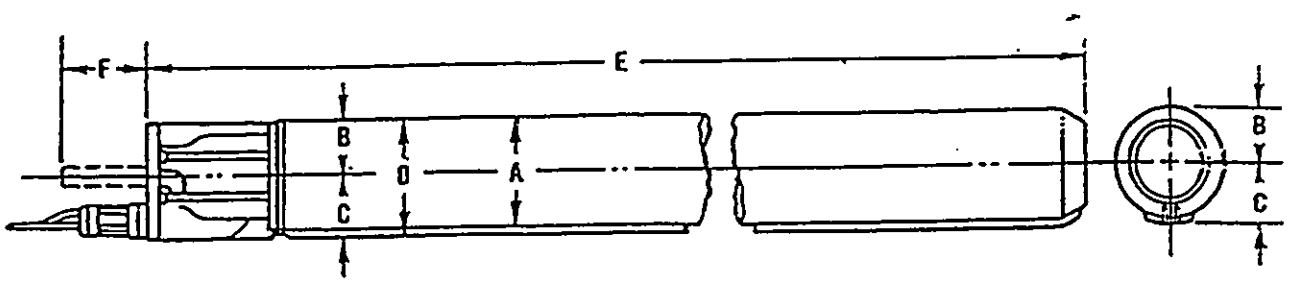
TOP SIZE	HORSE POWER	(1) VOLTAGE	AMPERES (2) RATED AMPS	AMPERES (2) STARTING CURRENT %	AMPERES NO LOAD	FULL LOAD RPM	½ LOAD P.F.	½ LOAD EFF.	¾ LOAD P.F.	¾ LOAD EFF.	FULL LOAD P.F.	FULL LOAD EFF.
1"	7.5	460	11	300	2.3	1745	72	75	80	80	84	81
	10		16	525	8.5	1765	58	75	68	81	74	82
	15		22	380	8.5	1745	68	81	76	83	81	83
	20		28	300	8.5	1725	74	82	81	83	84	83
	25		35	350	15	1735	64	79	74	85	79	86
	30		41	300	15	1720	68	82	77	86	82	85
1½"	40	460	50	470	18	1770	71	83	80	86	85	87
	50		65	360	18	1760	77	85	84	87	86	86
	60		83	425	35	1770	61	82	73	86	80	87
	75		98	360	35	1760	68	85	78	87	84	87
	100	460	140	415	45	1765	70	86	80	88	84	88
	125		160	420	55	1760	77	85	79	87	81	88
2"	150	[illegible]	195	370	74	1751	66	88	74	89	80	90
	200		250	330	100	1742	70	86	75	88	80	89
	125	2300	34	370	12	1750	68	88	75	87	80	89
	150		40	370	14	1748	66	88	74	89	80	90
	175		47	350	16	1746	66	86	72	88	80	89
	200		54	340	18	1742	70	86	75	88	80	89
	125	460	153	440	50	1756	84	83	88	86	88	87
	150		182	440	55	1754	83	83	88	87	88	88
	200		240	485	85	1760	77	86	83	88	87	89
	250		310	490	116	1760	74	85	82	88	85	90
	300		360	420	120	1751	76	85	83	88	85	90
4"	125	2300	30	405	7	1750	88	83	88	85	89	87
	150		36	420	10	1750	88	83	88	85	89	87
	200		48	380	14	1750	87	84	88	86	88	88
	250		60	450	18	1760	83	84	86	86	88	88
	300		74	405	20	1751	84	84	86	86	88	88
	300	2300	76	440	23	1773	76	87	81	88	83	89
	350		89	408	23	1770	79	87	82	88	83	89
	400		101	400	26	1769	79	87	82	88	83	89
	450		114	430	33	1774	77	87	81	88	83	89
	500		127	385	33	1770	80	87	82	88	83	89
	600		152	430	45	1774	76	87	81	88	83	89
5"	300	4000	42	529	17	1778	75	87	78	88	83	89
	350		49	447	17	1773	77	87	80	88	83	89
	400		56	474	18	1775	76	87	80	88	83	89
	450		63	576	24	1780	70	87	79	88	83	89
	500		70	475	22	1775	76	87	80	88	83	89
	600		88	420	26	1774	77	87	81	88	83	89
	600	2300	154	402	68	1774	79	81	83	86	84	87
	700		177	350	68	1768	79	82	83	87	84	88
	800		203	360	70	1770	79	84	83	87	84	88
3"	600	4000	89	425	30	1776	79	81	83	86	84	87
	700		98	367	30	1772	79	82	83	87	84	88
	800		117	365	32	1772	79	84	83	87	84	88
	800	4000	115	430	29	1762	76	80	83	85	86	87
	1000		144	408	33	1760	77	80	84	85	86	87
	1250		180	450	44	1768	77	80	84	85	86	87
	1500		216	420	49	1767	77	80	84	85	86	87
4"	600	6600	54	410	14	1760	76	78	83	83	86	84
	800		72	425	18	1762	76	79	83	83	86	85
	1000		90	450	23	1764	76	79	83	83	86	85
	1250		112	410	26	1760	77	80	84	84	86	85
	1500		133	415	31	1760	77	80	84	84	86	86

Motors are connected for operation on one voltage only.
Service factor AMPS equal to rated AMPS Plus 10%.

4 POLE SUBMERSIBLE MOTORS

TECHNICAL DATA

1800 RPM — 3 PHASE — 60 CYCLE



FLAT & ROUND TYPE CABLE

MOTOR SIZE	HORSE-POWER	VOLTS	TYPE OF TERMINAL BOX	FLAT CABLE SIZE	ROUND CABLE SIZE	DOWN THRUST CAPACITY AT PUMP SHUT OFF	MIN. WELL I.D.	OUTSIDE DIA. OF STATOR A	℄ TO OUTSIDE OF MOTOR: SIDE OPPOSITE TERMINAL BOX B	℄ TO OUTSIDE OF MOTOR: TERMINAL BOX SIDE C	OVERALL WIDTH OF MOTOR (B + C) D	LENGTH OF MOTOR E	SHAFT EXTEN-SION F	SHIPPING WEIGHT OF MOTOR	HORSE-POWER
6"	7½ 10 15 20 25 30	460	Flat Type Cable	#2	–	4900#	6"	7¼"	3¼"	4¼"	7¼"	53¼" 60 60 60 67½ 67½	5¹¹⁄₁₆"	450# 465 480 500 525 550	7½ 10 15 20 25 30
10"	40 50 60 75	460	Flat Type Cable	#2	–	7600#	10"	9¼"	4¼"	5¼"	9¼"	68¼ 68¼ 79¼ 79¼	6¼"	845# 950 1100 1250	40 50 60 75
	100 125	460 460										83¼ 92¼		1365 1490	100 125
12"	125 150 175 200	460	Flat Type Cable	#1/0	–	10,800#	12"	11"	5½"	6¹⁄₁₆"	11¹⁄₁₆"	90¼ 99¼ 103¼ 105¼	7¹³⁄₁₆"	2010# 2100 2210 2265	125 150 175 200
	125 150 175 200	2300	Flat Type Cable	#4 SKV	–	10,800#	12"	11"	5½"	6¹⁄₁₆"	11¹⁄₁₆"	90¼ 99¼ 103¼ 105¼	7¹³⁄₁₆"	2010# 2100 2210 2265	125 150 175 200
14"	125 150 200 250 300	460	Flat Type Cable	#1/0	–	16,700#	14"	12¾"	6¼"	7¹³⁄₁₆"	13¹³⁄₁₆"	96½ 100½ 106½ 117½ 121½	7¹³⁄₁₆"	2400# 2550 2810 3100 3228	125 150 200 250 300
14"	125 150 200 250 300	2300	Flat Type Cable	#4 SKV	#6 #2 #1/0	16,700#	14"	12¾"	6¼"	7¹³⁄₁₆"	13¹³⁄₁₆"	100½ 106½ 117½ 121½ 121½	7¹³⁄₁₆"	2580# 2840 3140 3273 3273	125 150 200 250 300
17"	300 350 400 450	2300	2300 V Flat Cable Type	2300 V #4 SKV	#6 #2 #1/0	16,700#	16½"	15"	7½"	8¼"	16½"	106½ 114 122 129½	8¼"	3725# 4100 4250 4390	300 350 400 450
	500 600	4000	4160 V Spc'l	4160 V Spc'l	#4/0							133½ 146		4400 4600	500 600
16"	600 700 800	2300	Flat Type Cable	#4/0 SKV	350 MCM	16,700#	17¼"	15¹⁵⁄₁₆"	7¹³⁄₁₆"	8¹³⁄₁₆"	16¹³⁄₁₆"	140 146	8¹³⁄₁₆"	4650# 5000	600 700
		4000	Spc'l	Spc'l	#6-350 MCM							156		5350	800
21"	600 800 1000 1250 1500	4000 6600	Spc'l	Spc'l	Spc'l	28,000#	23"	20"	10"	11"	21"	134½ 144½ 156 167 180	9½"	4300# 5200 6100 7100 8200	600 800 1000 1250 1500

* Flat cables must be submerged during operation on all motors.

SUBMERSIBLE — TECHNICAL DATA

ROUND CABLE SELECTION GUIDE

ge: 460

Hertz: 60

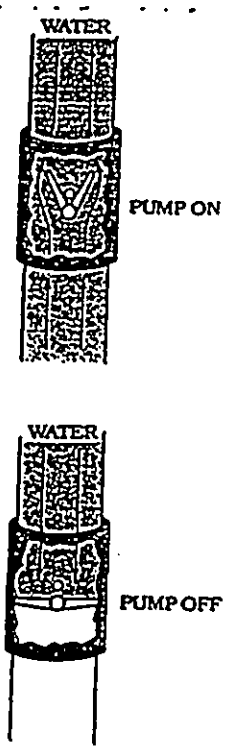
MOTOR RATED AMPS	CABLE SIZE																			
	#8 AWG		#6 AWG		#4 AWG		#2 AWG		#1 AWG		#1/0 AWG		#2/0 AWG		#4/0 AWG		300 MCM		500 MCM	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
22	1029 707 514	0.032 0.067 0.127	1631 1121 815	0.020 0.042 0.080	2579 1773 1290	0.013 0.027 0.050	4051 2785 2025	0.008 0.017 0.032	5056 3476 2528	0.006 0.013 0.025	6281 4318 3141	0.005 0.011 0.020	7749 5327 3874	0.004 0.008 0.016	11411 7845 5706	0.002 0.005 0.010	14676 10089 7338	0.002 0.004 0.007	19394 13333 9697	0.001 0.002 0.004
	404 323 276	0.206 0.322 0.442	641 512 437	0.130 0.202 0.278	1013 811 692	0.081 0.127 0.175	1591 1273 1087	0.051 0.080 0.110	1986 1589 1357	0.041 0.063 0.087	2468 1974 1685	0.032 0.050 0.069	3044 2435 2079	0.026 0.040 0.055	4483 3586 3062	0.016 0.025 0.034	5765 4612 3937	0.011 0.016 0.024	7619 6095 5203	0.007 0.011 0.015
50	228 174	0.857 1.110	359 276 216	0.413 0.696 1.139	567 437 342	0.260 0.439 0.716	891 686 537	0.163 0.276 0.450	1112 856 670	0.130 0.219 0.357	1382 1063 832	0.103 0.174 0.283	1705 1311 1027	0.081 0.138 0.225	2510 1931 1512	0.051 0.087 0.141	3229 2484 1945	0.036 0.061 0.100	4267 3282 2570	0.022 0.037 0.060
140 160					290	0.998	455 318	0.628 1.262	568 397 348	0.498 1.016 1.327	705 494 432	0.395 0.806 1.052	870 609 533	0.313 0.639 0.834	1281 897 785	0.197 0.402 0.525	1647 1153 1009	0.139 0.283 0.370	2177 1524 1333	0.083 0.170 0.222
250													437	1.239	644 546 502	0.780 1.065 1.281	828 702 646	0.550 0.765 0.904	1094 928 853	0.330 0.459 0.542
																	521	1.389	688 593	0.834 1.124

1. Column "A" gives the maximum allowable cable lengths in feet.
2. Column "B" gives cable loss in HP/100 ft. of cable at full load.
3. Stock 600V cable sizes are 6 & 4 AWG, and 300 & 500 MCM.
4. Stock 5KV cable sizes are 6, 2, 1/0, and 4/0 AWG (5KV cable may be substituted for 600V cables).
5. Cable ampacity limits are per NEC (National Electric Code) Table 310-28, 1987.
   Ampacity limit is 1.10 x motor rated AMPS (Motor service factory is 1.10) not the 1.25 multiplier as stated in NEC for motor branch circuits for 600V and less systems.
6. Cable sizing is for round cable (3 conductor jacketed cable) only.

Eliminates damaging backsurge

The patented Lakewood Surge Control Valve eliminates damaging backsurge when the pump shuts off. As the pump operates, the valve wings fold up on "open" position—with minimal resistance or restriction of water flow.

When the pump shuts off, water pressure forces valve wings to fold down, eliminating powerful backsurge from water remaining in the upper column pipe. This water is allowed to safely and slowly bleed back through the surge valve, protecting pump parts and well structure.



The Lakewood Surge Control Valve:

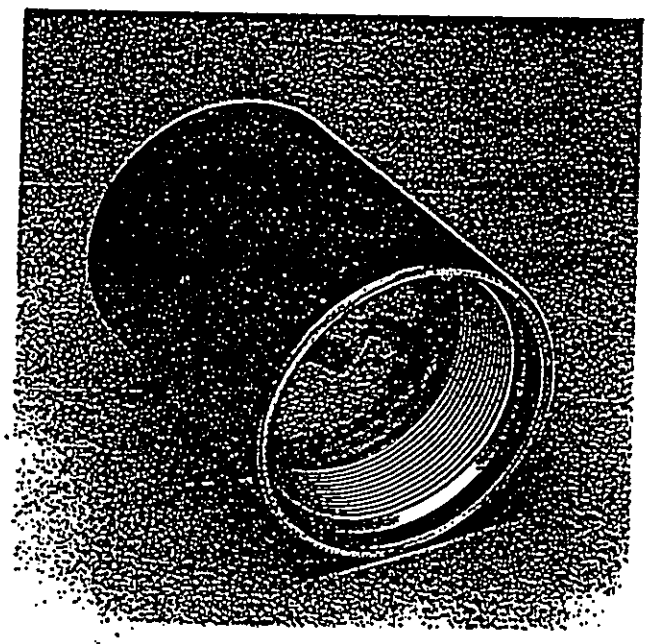
- Economical—low-cost, positive water control.
- Efficient—minimal or no maintenance.
- Effective—total control of backsurge.
- Easy to install—installation as simple as a coupling.
- Selection—a range of sizes to suit your needs, 3"—12", also available in stainless steel.

Dynamically engineered:

- All steel construction—seamless coupling stock, steel seats.
- Quality tested—to 1,000 lbs.
- Numerically controlled machining—for true threads and faces.
- Quiet—neoprene tube shock absorber on upper cross bar.
- Superior design—minimal flow resistance, only two moving parts.
- Quality construction—all NPT threads, 8V and 8Rd, or flanged.

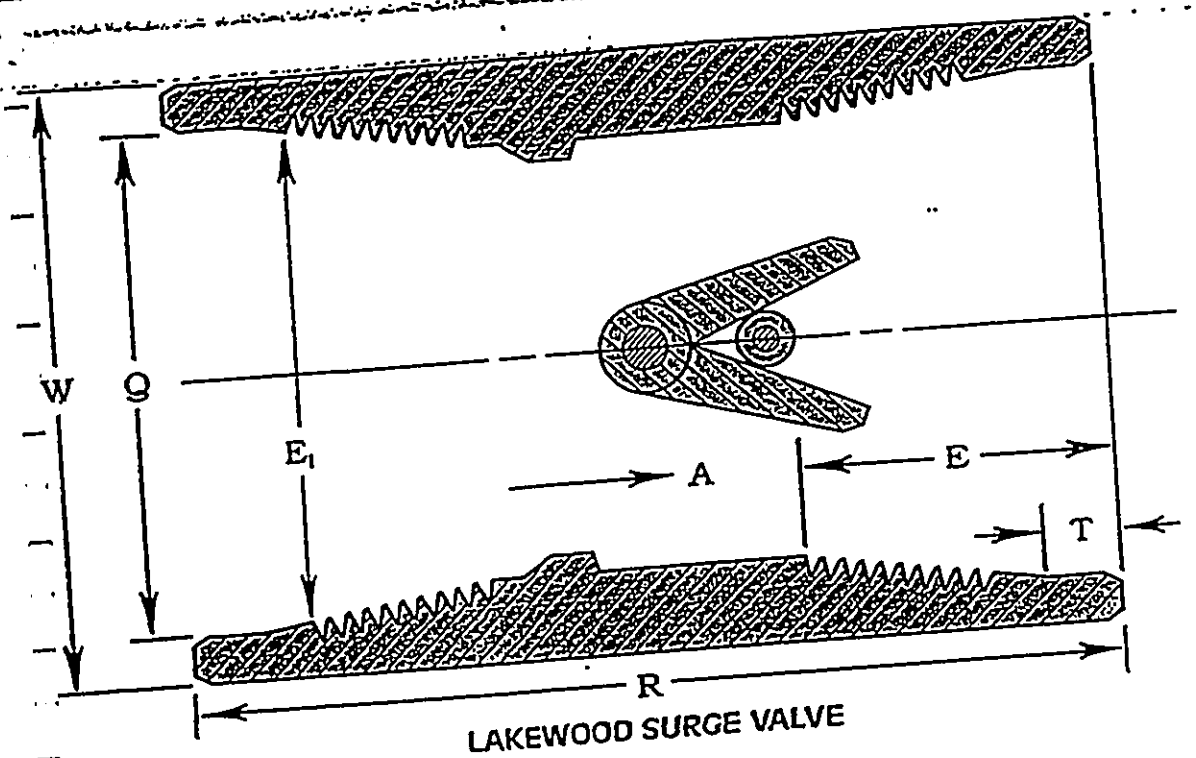
Many customers prefer using Lakewood Surge Control Valves in tandem on deep set wells. In tandem, one surge valve is usually installed 100' or less above the pump, the second valve at the static water level. Tandem surge valves add sure, accurate control of backsurge and backwash in many well conditions. And should the pump ever need to be pulled, the Lakewood Surge Valve allows water to bleed out of the pipe and pump, making the job easier and eliminating a watery mess around the rig. The Lakewood Surge Valve can also be used on shaft-driven turbine pumps, installed at the suction end. Pump, shaft and well structure are then protected from damaging backflush.

The Lakewood Surge Control Valve is built for long life in your well. Installs as easily as a column pipe coupling on most any water well where you need to control backwash.



LAKEWOOD SURGE VALVES

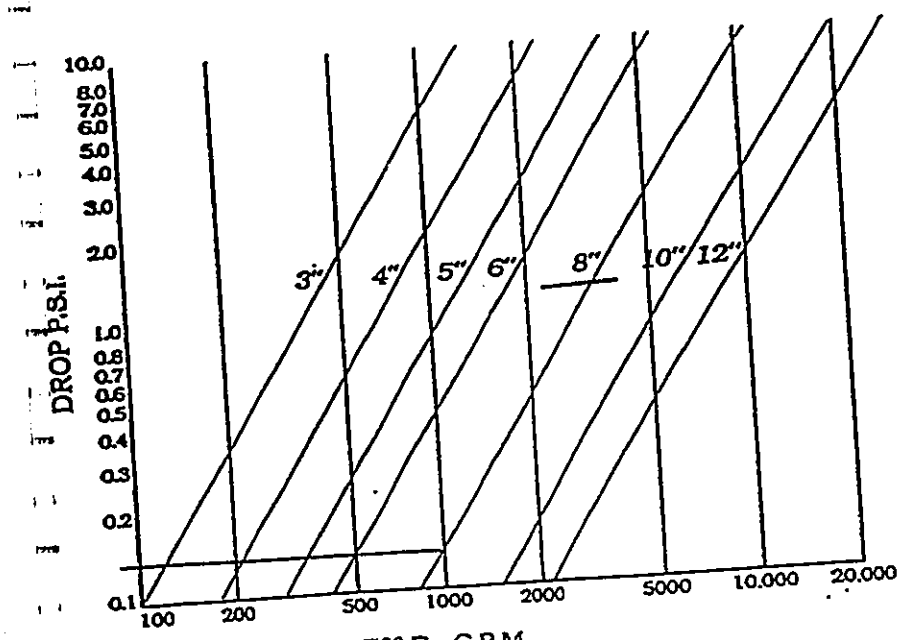
for submersible and turbine pump installations



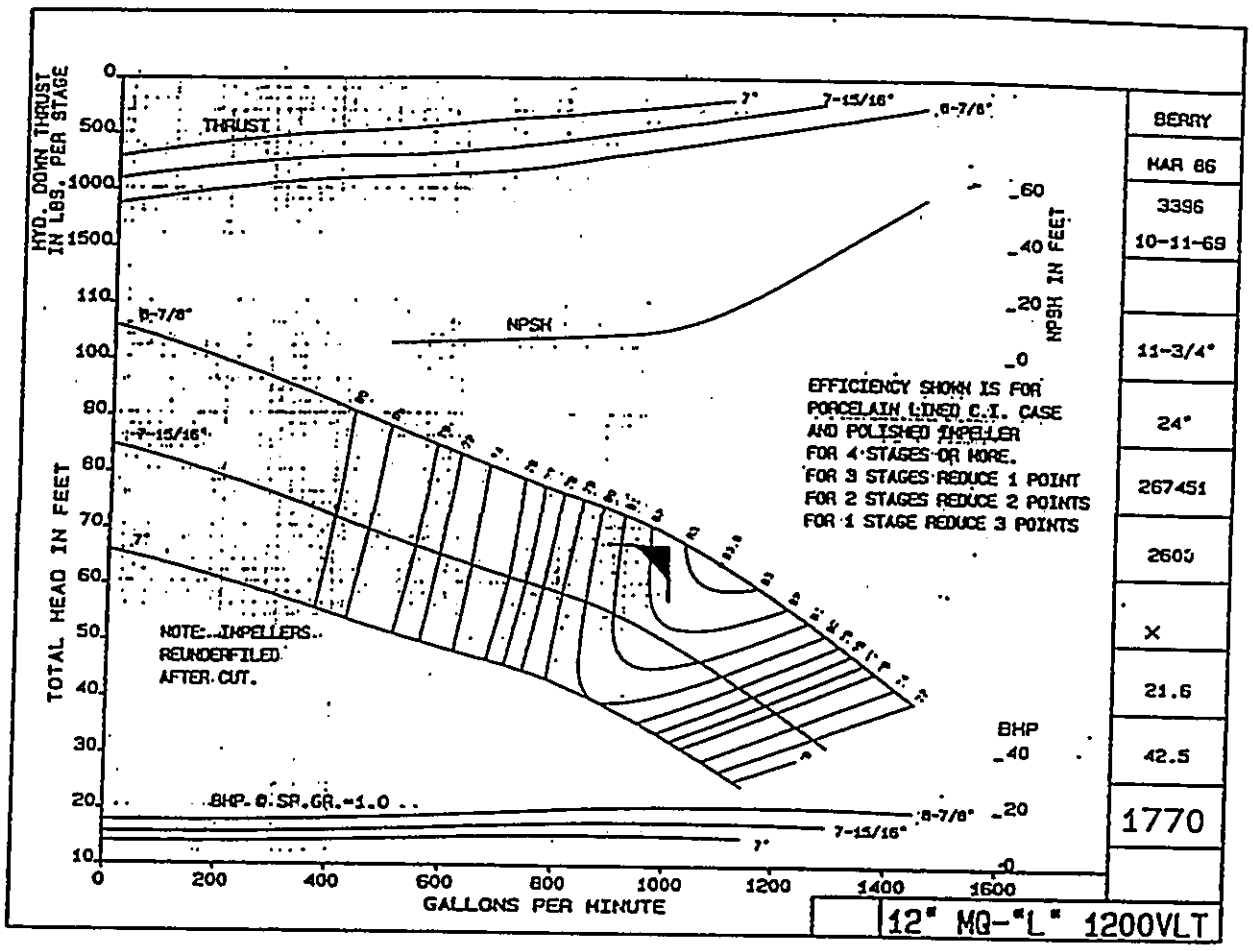
LAKEWOOD SURGE VALVE

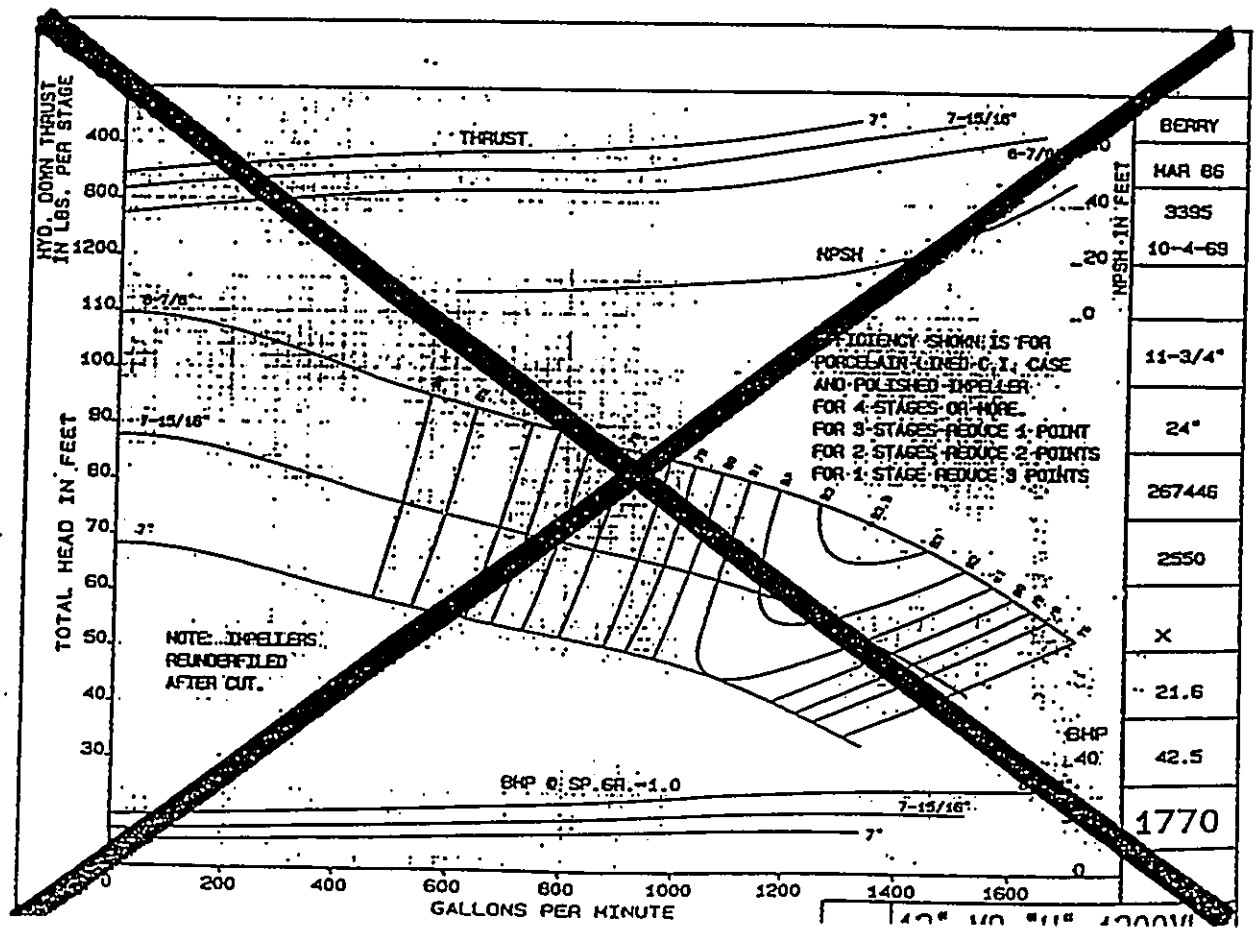
NOM. SIZE	P.D. D	VALVE O.D. W	C'BORE D	C'BORE R	Q	T	WEIGHT LBS.	SQ. IN. AREA OPENING
3"	3.388	4.000	2.125	6¼	3.590	.471	7.5	5.36
4"	4.387	5.000	2.250	6¾	4.590	.490	11	10.31
5"	5.449	6.290	2.312	7⅞	5.650	.500	19	14.88
8"	8.500	9.625	2.625	8¾	8.719	.676	49	40.16
12"	12.617	14.000	3.000	12	12.810	.780	97	95.0

—Special sizes, materials or threads on request.



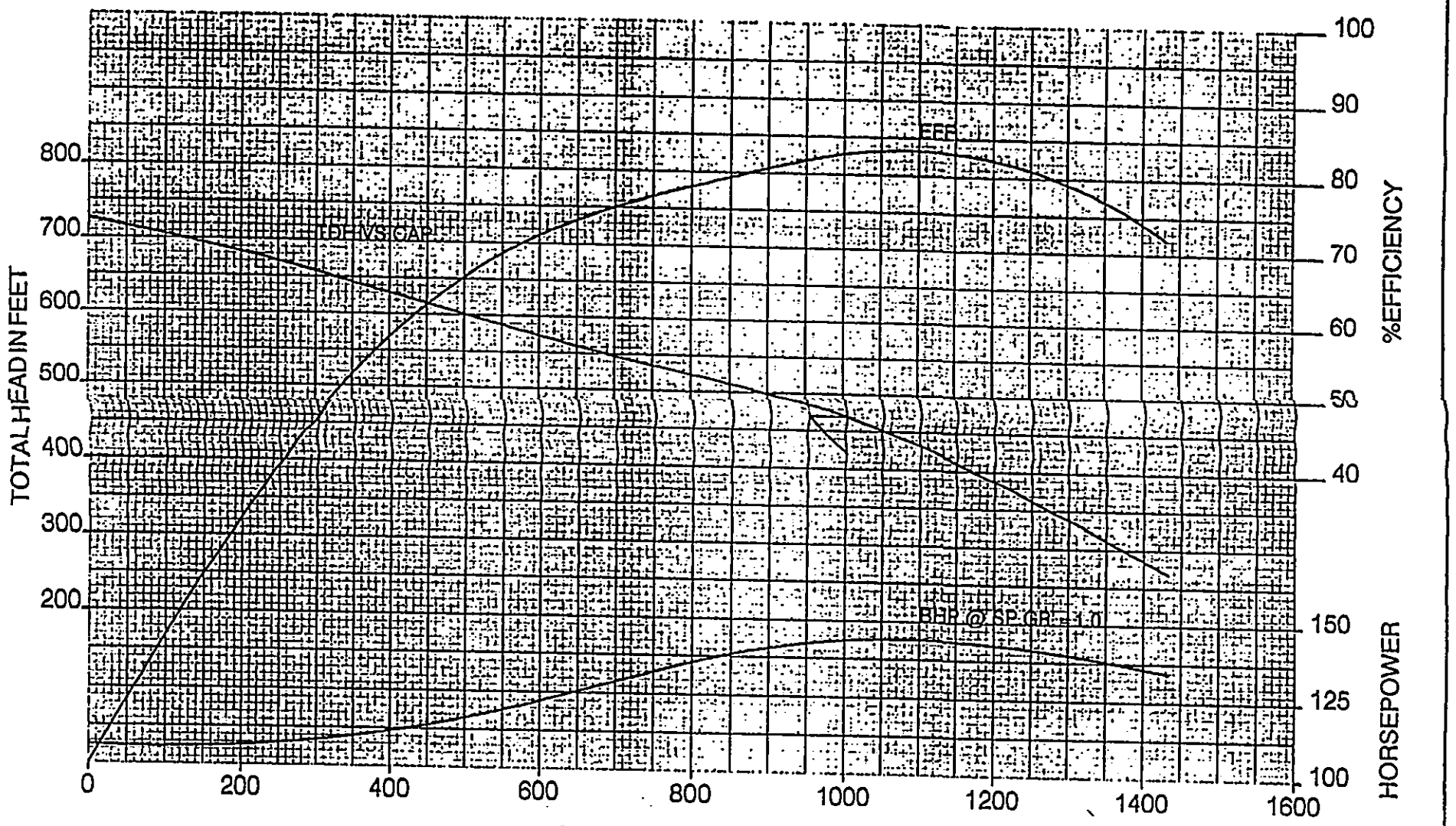
LAKEWOOD SURGE VALVE HEAD LOSS CHART


HYD. DOWN THRUST IN LBS. PER STAGE
THRUST
7"
7-15/16"
8-7/8"
NPSH
NPSH IN FEET
EFFICIENCY SHOWN IS FOR PORCELAIN LINED C.I. CASE AND POLISHED IMPELLER
FOR 4 STAGES OR MORE.
FOR 3 STAGES REDUCE 1 POINT
FOR 2 STAGES REDUCE 2 POINTS
FOR 1 STAGE REDUCE 3 POINTS
NOTE: IMPELLERS REUNDERFILED AFTER CUT.
TOTAL HEAD IN FEET
BHP
BHP @ SP.GR.=1.0
GALLONS PER MINUTE
BERRY
MAR 86
3396
10-11-69
11-3/4"
24"
267451
2600
X
21.6
42.5
1770
12" MQ-"L" 1200VLT


HYD. DOWN THRUST IN LBS. PER STAGE
THRUST
7"
7-15/16"
NPSH
NPSH IN FEET
EFFICIENCY SHOWN IS FOR PORCELAIN LINED C.I. CASE AND POLISHED IMPELLER
FOR 4 STAGES OR MORE.
FOR 3 STAGES REDUCE 1 POINT
FOR 2 STAGES REDUCE 2 POINTS
FOR 1 STAGE REDUCE 3 POINTS
NOTE: IMPELLERS REUNDERFILED AFTER CUT.
TOTAL HEAD IN FEET
BHP
BHP @ SP.GR.=1.0
GALLONS PER MINUTE
BERRY
MAR 86
3395
10-4-69
11-3/4"
24"
267446
2550
X
21.6
42.5
1770

Gl[illegible]sso[illegible]

Waipahu Well No. 3



Imp Size & Type		RPM	Imp. Number	Vanes	Diameter	Underfile	Stages
12MQ	7 STG. L7	1750	267451		8.37483		7L
Data By	grd	Date					
Curve By		29 SEP 94					

Factory No.	Customer No.	Item No.	Imp. Material	NI-al bronze	Motor H.P.	Curve No.
			Case Material	C.I.	150	

APPENDIX C

WATER QUALITY DATA

MONTGOMERY LABORATORIES
555 East Walnut Street
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1

Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

MONTGOMERY LABORATORIES
Submitted on
AUG 2 3 1994
HDS

Report#: 15038

MONTGOMERY LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940816017 Sample ID WAIPAHU III (940721008) Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 23-aug-1994

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Thallium, GF (HL/EPA 200.9)	mg/l	ND				0.001	18-aug-1994	eyw	22-aug-1994	klm

Report #: 15038

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Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940816017 Sample ID WAIPAHU III (940721008) Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 23-aug-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Thallium, GF	mg/l	0.040	0.0444	112
LCS2	Thallium, GF	mg/l	0.040	0.0462	116
MBLK	Thallium, GF	mg/l	ND	ND	
MS	Thallium, GF	mg/l	0.040	0.0463	116
MSD	Thallium, GF	mg/l	0.040	0.0450	112

Report #: 15038

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Laboratory Report

KF -
Returning to
your files.
I made copies for
myself. Thanks.
Ken

Lab
t
.3
acher

Report#: 14571

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818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721008 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 17-aug-1994

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Beryllium, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.001			22-jul-1994	jps
Cadmium, Total, GF	(HL/EPA206.2)	mg/l	ND				0.001	02-aug-1994	gto	02-aug-1994	gto
Mercury	(HL/EPA 245.1)	ug/l	ND				0.2	22-jul-1994	eyw	22-jul-1994	eyw
Nickel, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.01			22-jul-1994	jps
Antimony, Total, GF	(HL/EPA200.9)	mg/l	ND				0.005	01-aug-1994	gto	01-aug-1994	gto
2,3,7,8 - Dioxin	(1613)	Picograms/L	ND				5.91	25-jul-1994	col	09-aug-1994	col

Report #: 14571

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ATTN: Ron Fenstemacher

Sample # 940721008 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 17-aug-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0492	98
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0504	101
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0496	99
MSD	Beryllium, Total, ICAP	mg/l	0.05	0.0491	98
LCS1	Cadmium, Total, GF	mg/l	0.0100	0.0102	102
LCS2	Cadmium, Total, GF	mg/l	0.0100	0.0099	99
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.0100	0.0104	104
MSD	Cadmium, Total, GF	mg/l	0.0100	0.0098	98
LCS1	Mercury	ug/l	1.50	1.42	95
LCS2	Mercury	ug/l	1.50	1.49	99
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.57	105
MSD	Mercury	ug/l	1.50	1.56	104
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.495	99
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.500	100
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.486	97
MSD	Nickel, Total, ICAP	mg/l	0.5	0.486	97
LCS1	Antimony, Total, GF	mg/l	0.040	0.041	102
LCS2	Antimony, Total, GF	mg/l	0.040	0.042	105
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.042	105
MSD	Antimony, Total, GF	mg/l	0.040	0.042	105

Report #: 14571

Report 14571 Comment Page

Group Validation Comments

Result for TCDD analysis is submitted by Pace, Inc.

Sample# 940721008
Source: WAIPAHU III

Validation Test Comments

Sample needs to be analyzed for Tl-low rather than TL-GF. M (TL-GF)
artin will correct in database. Please rerun and re-enter w (TL-GF)
ith 1 ppb dl. (TL-GF)

MONTGOMERY LABORATORIES
555 East Walnut Street
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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 14569

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project

Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Dibromochloropropane (DBCP)	ug/l	ND				0.01	02-aug-1994	hth	02-aug-1994	hth
Ethylene Dibromide (EDB)	ug/l	0.03				0.01	02-aug-1994	hth	02-aug-1994	hth
Data Entry	--	08/03/94				0	02-aug-1994	hth	02-aug-1994	hth

Report #: 14569

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Laboratory Report

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630 S Beretania St

Honolulu , HI 96843
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Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	NA	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	NA	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
MS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

Report #: 14569

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Laboratory Report

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630 S Beretania St

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ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project

Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
alpha-Chlordane	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Acenaphthylene	ug/l	ND				0.1	26-Jul-1994	llj	29-Jul-1994	crw
Alachlor	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Aldrin	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Anthracene	ug/l	ND				0.02	26-Jul-1994	llj	29-Jul-1994	crw
Atrazine	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Benz(a)Anthracene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Benzo(a)pyrene	ug/l	ND				0.02	26-Jul-1994	llj	29-Jul-1994	crw
Benzo(b)fluoranthene	ug/l	ND				0.02	26-Jul-1994	llj	29-Jul-1994	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	26-Jul-1994	llj	29-Jul-1994	crw
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	26-Jul-1994	llj	29-Jul-1994	crw
Butylbenzylphthalate	ug/l	ND				0.5	26-Jul-1994	llj	29-Jul-1994	crw
Bromacil	ug/l	ND				2	26-Jul-1994	llj	29-Jul-1994	crw
Butachlor	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Chrysene	ug/l	ND				0.02	26-Jul-1994	llj	29-Jul-1994	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	26-Jul-1994	llj	29-Jul-1994	crw
Diethylphthalate	ug/l	ND				0.5	26-Jul-1994	llj	29-Jul-1994	crw
Diazinon	ug/l	ND				0.1	26-Jul-1994	llj	29-Jul-1994	crw
Dieldrin	ug/l	ND				0.2	26-Jul-1994	llj	29-Jul-1994	crw
Dimethylphthalate	ug/l	ND				0.5	26-Jul-1994	llj	29-Jul-1994	crw
Dimethoate	ug/l	ND				10	26-Jul-1994	llj	29-Jul-1994	crw
Di-n-Butylphthalate	ug/l	ND				0.5	26-Jul-1994	llj	29-Jul-1994	crw
Endrin	ug/l	ND				0.1	26-Jul-1994	llj	29-Jul-1994	crw
Fluorene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Gamma-Chlordane	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Hexachlorobenzene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jul-1994	llj	29-Jul-1994	crw

Report #: 14569

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.04	26-Jul-1994	tlj	29-Jul-1994	crw
Heptachlor Epoxide	ug/l	ND				0.02	26-Jul-1994	tlj	29-Jul-1994	crw
Indeno(1,2,3-c,d)Pyrene	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Isophorone	ug/l	ND				0.5	26-Jul-1994	tlj	29-Jul-1994	crw
Lindane	ug/l	ND				0.02	26-Jul-1994	tlj	29-Jul-1994	crw
Methoxychlor	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Metribuzin	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Molinate	ug/l	ND				0.2	26-Jul-1994	tlj	29-Jul-1994	crw
Metolachlor	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
trans-Nonachlor	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Pentachlorophenol	ug/l	ND				1	26-Jul-1994	tlj	29-Jul-1994	crw
Phenanthrene	ug/l	ND				0.02	26-Jul-1994	tlj	29-Jul-1994	crw
Prometryn	mg/l	ND				0.5	26-Jul-1994	tlj	29-Jul-1994	crw
Propachlor	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Pyrene	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Simazine	ug/l	ND				0.05	26-Jul-1994	tlj	29-Jul-1994	crw
Thiobencarb	ug/l	ND				0.2	26-Jul-1994	tlj	29-Jul-1994	crw
Trifluralin	ug/l	ND				0.1	26-Jul-1994	tlj	29-Jul-1994	crw

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Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	96	70 - 130

Report #: 14569

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Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	2.25	112
LCS1	Acenaphthylene	ug/l	2	2.12	106
LCS1	Alachlor	ug/l	2	2.47	124
LCS1	Aldrin	ug/l	2	1.95	98
LCS1	Anthracene	ug/l	2	2.08	104
LCS1	Atrazine	ug/l	2	2.17	108
LCS1	Benz(a)Anthracene	ug/l	2	1.77	88
LCS1	Benzo(a)pyrene	ug/l	2	2.03	102
LCS1	Benzo(b)fluoranthene	ug/l	2	2.12	106
LCS1	Benzo(g,h,i)Perylene	ug/l	2	2.02	101
LCS1	Benzo(k)fluoranthene	ug/l	2	2.23	112
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	2.36	118
LCS1	Butylbenzylphthalate	ug/l	2	1.97	98
LCS1	Chrysene	ug/l	2	1.98	99
LCS1	Dibenzo(a,h)Anthracene	ug/l	2	2.01	100
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	2.08	104
LCS1	Diethylphthalate	ug/l	2	2.47	124
LCS1	Dimethylphthalate	ug/l	2	2.34	117
LCS1	Di-n-Butylphthalate	ug/l	2	2.32	116
LCS1	Endrin	ug/l	2	1.88	94
LCS1	Fluorene	ug/l	2	2.15	108
LCS1	gamma-Chlordane	ug/l	2	2.35	118
LCS1	Hexachlorobenzene	ug/l	2	1.94	97
LCS1	Hexachlorocyclopentadiene	ug/l	2	2.03	102
LCS1	Heptachlor	ug/l	2	2.03	102
LCS1	Heptachlor Epoxide	ug/l	2	2.31	116
LCS1	Indeno(1,2,3-c,d)Pyrene	ug/l	2	1.95	98
LCS1	Lindane	ug/l	2	2.17	108
LCS1	Methoxychlor	ug/l	2	2.54	127
LCS1	Molinate	ug/l	2	2.38	119
LCS1	trans-Nonachlor	ug/l	2	2.31	116

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	8	11.7	146
LCS1	Phenanthrene	ug/l	2	2.10	105
LCS1	Pyrene	ug/l	2	2.39	120
LCS1	Simazine	ug/l	2	1.78	89
LCS1	Thiobencarb	ug/l	2	2.32	116
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Bis(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di-(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	mg/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.16	108
MS	Acenaphthylene	ug/l	2	2.08	104
MS	Alachlor	ug/l	2	2.32	116
MS	Aldrin	ug/l	2	1.91	96
MS	Anthracene	ug/l	2	1.92	96
MS	Atrazine	ug/l	2	2.08	104
MS	Benz(a)Anthracene	ug/l	2	1.61	80
MS	Benzo(a)pyrene	ug/l	2	1.71	86
MS	Benzo(b)Fluoranthene	ug/l	2	1.68	84
MS	Benzo(g,h,i)Perylene	ug/l	2	1.72	86

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(k)Fluoranthene	ug/l	2	1.95	98
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.91	96
MS	Butylbenzylphthalate	ug/l	2	1.84	92
MS	Chrysene	ug/l	2	1.83	92
MS	Dibenz(a,h)Anthracene	ug/l	2	1.55	78
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.95	98
MS	Diethylphthalate	ug/l	2	2.37	118
MS	Dimethylphthalate	ug/l	2	2.24	112
MS	Di-n-Butylphthalate	ug/l	2	2.08	104
MS	Endrin	ug/l	2	2.09	104
MS	Fluorene	ug/l	2	2.12	106
MS	gamma-Chlordane	ug/l	2	2.16	108
MS	Hexachlorobenzene	ug/l	2	1.94	97
MS	Hexachlorocyclopentadiene	ug/l	2	1.41	70
MS	Heptachlor	ug/l	2	1.98	99
MS	Heptachlor Epoxide	ug/l	2	2.12	106
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.50	75
MS	Lindane	ug/l	2	2.05	102
MS	Methoxychlor	ug/l	2	2.05	102
MS	Molinate	ug/l	2	2.34	117
MS	trans-Nonachlor	ug/l	2	2.20	110
MS	Pentachlorophenol	ug/l	8	10.0	125
MS	Phenanthrene	ug/l	2	2.05	102
MS	Pyrene	ug/l	2	2.09	104
MS	Simazine	ug/l	2	1.37	68
MS	Thiobencarb	ug/l	2	2.16	108

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Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-aug-1994

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 1016 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1221 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1232 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1242 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1248 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1254 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
PCB 1260 Arochlor	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
Alpha-BHC	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Alachlor (Alanex)	ug/l	ND				0.05	23-Jul-1994	kah	04-aug-1994	kah
Aldrin	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Beta-BHC	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Chlordane	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994	kah
Chlorthalonil (Orconil, Bravo)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Delta-BHC	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
P,P' DDD	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
P,P' DDE	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
P,P' DDT	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Dieldrin	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Endrin Aldehyde	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Endrin	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Endosulfan II(alpha)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Endosulfan II (beta)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Endosulfan sulfate	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Heptachlor	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Heptachlor Epoxide	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Lindane (gamma-BHC)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994	kah
Methoxychlor	ug/l	ND				0.05	23-Jul-1994	kah	04-aug-1994	kah
Toxaphene	ug/l	ND				0.5	23-Jul-1994	kah	04-aug-1994	kah
Date Entry	--	08/05/94				0	23-Jul-1994	kah	04-aug-1994	kah

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SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	108	70 - 130

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SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.03	60
LCS1	p,p' DDT	ug/l	0.10	0.08	80
LCS1	Dieldrin	ug/l	0.10	0.09	90
LCS1	Endrin	ug/l	0.10	0.08	80
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.04	80
LCS1	Heptachlor	ug/l	0.05	0.04	80
LCS2	Aldrin	ug/l	0.05	0.03	60
LCS2	p,p' DDT	ug/l	0.10	0.08	80
LCS2	Dieldrin	ug/l	0.10	0.09	90
LCS2	Endrin	ug/l	0.10	0.09	90
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	0.04	80
LCS2	Heptachlor	ug/l	0.05	0.04	80
MBLK	PCB 1016 Arochlor	ug/l	ND	ND	
MBLK	PCB 1221 Arochlor	ug/l	ND	ND	
MBLK	PCB 1232 Arochlor	ug/l	ND	ND	
MBLK	PCB 1242 Arochlor	ug/l	ND	ND	
MBLK	PCB 1248 Arochlor	ug/l	ND	ND	
MBLK	PCB 1254 Arochlor	ug/l	ND	ND	
MBLK	PCB 1260 Arochlor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	NA	
MS	p,p' DDT	ug/l	0.10	NA	
MS	Dieldrin	ug/l	0.10	NA	
MS	Endrin	ug/l	0.10	NA	
MS	Gamma-BHC (Lindane)	ug/l	0.05	NA	
MS	Heptachlor	ug/l	0.05	NA	

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1,2-Tetrachloroethane	ug/l	ND				0.5			25-jul-1994	col
1,1,1-Trichloroethane	ug/l	ND				0.5			25-jul-1994	col
1,1,2,2-Tetrachloroethane	ug/l	ND				0.5			25-jul-1994	col
1,1,2-Trichloroethane	ug/l	ND				0.5			25-jul-1994	col
1,1-Dichloroethane	ug/l	ND				0.5			25-jul-1994	col
1,1-Dichloroethylene	ug/l	ND				0.5			25-jul-1994	col
1,1-Dichloropropene	ug/l	ND				0.5			25-jul-1994	col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			25-jul-1994	col
1,2,3-Trichloropropane	ug/l	ND				0.5			25-jul-1994	col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			25-jul-1994	col
1,2,4-Trimethylbenzene	ug/l	ND				0.5			25-jul-1994	col
1,2-Dichloroethane	ug/l	ND				0.5			25-jul-1994	col
1,2-Dichloropropane	ug/l	ND				0.5			25-jul-1994	col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			25-jul-1994	col
1,3-Dichloropropane	ug/l	ND				0.5			25-jul-1994	col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			25-jul-1994	col
2,2-Dichloropropane	ug/l	ND				0.5			25-jul-1994	col
2-Butanone (MEK)	ug/l	ND				5			25-jul-1994	col
2-Chloroethylvinylether	ug/l	ND				1			25-jul-1994	col
o-Chlorotoluene	ug/l	ND				0.5			25-jul-1994	col
p-Chlorotoluene	ug/l	ND				0.5			25-jul-1994	col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			25-jul-1994	col
Benzene	ug/l	ND				0.5			25-jul-1994	col
Bromobenzene	ug/l	ND				0.5			25-jul-1994	col
Bromomethane (Methyl Bromide)	ug/l	ND				0.5			25-jul-1994	col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			25-jul-1994	col
Chlorobenzene	ug/l	ND				0.5			25-jul-1994	col
Carbon Tetrachloride	ug/l	ND				0.5			25-jul-1994	col
cis-1,3-Dichloropropene	ug/l	ND				0.2			25-jul-1994	col

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Bromoform	ug/l	ND				0.5			25-Jul-1994	col
Chloroform (Trichloromethane)	ug/l	ND				0.5			25-Jul-1994	col
Bromochloromethane	ug/l	ND				0.5			25-Jul-1994	col
Chloroethane	ug/l	ND				0.5			25-Jul-1994	col
Chloromethane(Methyl Chloride)	ug/l	ND				0.5			25-Jul-1994	col
Chlorodibromomethane	ug/l	ND				0.5			25-Jul-1994	col
Dibromomethane	ug/l	ND				0.5			25-Jul-1994	col
Bromodichloromethane	ug/l	ND				0.5			25-Jul-1994	col
Dichloromethane	ug/l	ND				0.5			25-Jul-1994	col
Ethyl benzene	ug/l	ND				0.5			25-Jul-1994	col
Dichlorodifluoromethane	ug/l	ND				0.5			25-Jul-1994	col
Fluorotrichloromethane(Freon1)	ug/l	ND				0.5			25-Jul-1994	col
Hexachlorobutadiene	ug/l	ND				0.5			25-Jul-1994	col
Isopropylbenzene	ug/l	ND				0.5			25-Jul-1994	col
m-Dichlorobenzene (1,3-DCB)	ug/l	ND				0.5			25-Jul-1994	col
m,p-Xylenes	ug/l	ND				0.5			25-Jul-1994	col
Naphthalene	ug/l	ND				0.5			25-Jul-1994	col
n-Butylbenzene	ug/l	ND				0.5			25-Jul-1994	col
n-Propylbenzene	ug/l	ND				0.5			25-Jul-1994	col
o-Xylene	ug/l	ND				0.5			25-Jul-1994	col
o-Dichlorobenzene (1,2-DCB)	ug/l	ND				0.5			25-Jul-1994	col
Tetrachloroethylene (PCE)	ug/l	ND				0.5			25-Jul-1994	col
p-Isopropyltoluene	ug/l	ND				0.5			25-Jul-1994	col
sec-Butylbenzene	ug/l	ND				0.5			25-Jul-1994	col
Styrene	ug/l	ND				0.5			25-Jul-1994	col
trans-1,2-Dichloroethylene	ug/l	ND				0.5			25-Jul-1994	col
tert-Butylbenzene	ug/l	ND				0.5			25-Jul-1994	col
Trichloroethylene (TCE)	ug/l	ND				0.5			25-Jul-1994	col
Trichlorotrifluoroethane(Freon	ug/l	ND				0.5			25-Jul-1994	col

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Sample # 940721006 Sample ID WAIPAHU III Project

Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
trans-1,3-Dichloropropene	ug/l	ND				0.5			25-jul-1994	col
Toluene	ug/l	ND				0.5			25-jul-1994	col
Vinyl chloride (VC)	ug/l	ND				0.5			25-jul-1994	col

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Toluene-d8	91	80 - 120
1,2-Dichloroethane-d4	101	80 - 120
4-Bromofluorobenzene	104	80 - 120

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ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1-Dichloroethylene	ug/l	4	3.93	98
LCS1	1,2,4-Trichlorobenzene	ug/l	4	4.56	114
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.29	107
LCS1	p-Chlorotoluene	ug/l	4	4.68	117
LCS1	Benzene	ug/l	4	4.35	109
LCS1	Chlorobenzene	ug/l	4	4.76	119
LCS1	Chloroform (Trichloromethane)	ug/l	4	3.99	100
LCS1	Trichloroethylene (TCE)	ug/l	4	4.61	115
LCS1	Toluene	ug/l	4	4.55	114
LCS2	1,1-Dichloroethylene	ug/l	4	3.31	83
LCS2	1,2,4-Trichlorobenzene	ug/l	4	4.33	108
LCS2	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.91	98
LCS2	p-Chlorotoluene	ug/l	4	4.19	105
LCS2	Benzene	ug/l	4	3.99	100
LCS2	Chlorobenzene	ug/l	4	4.03	101
LCS2	Chloroform (Trichloromethane)	ug/l	4	3.55	89
LCS2	Trichloroethylene (TCE)	ug/l	4	3.80	95
LCS2	Toluene	ug/l	4	3.84	96
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane(Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloroethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane(Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	

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Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane(Freon	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	
MS	1,1-Dichloroethylene	ug/l	4	NA	
MS	1,2,4-Trichlorobenzene	ug/l	4	NA	
MS	p-Dichlorobenzene (1,4-DCB)	ug/l	4	NA	
MS	p-Chlorotoluene	ug/l	4	NA	
MS	Benzene	ug/l	4	NA	
MS	Chlorobenzene	ug/l	4	NA	
MS	Chloroform (Trichloromethane)	ug/l	4	NA	
MS	Trichloroethylene (TCE)	ug/l	4	NA	
MS	Toluene	ug/l	4	NA	
MSD	1,1-Dichloroethylene	ug/l	4	NA	
MSD	1,2,4-Trichlorobenzene	ug/l	4	NA	
MSD	p-Dichlorobenzene (1,4-DCB)	ug/l	4	NA	
MSD	p-Chlorotoluene	ug/l	4	NA	
MSD	Benzene	ug/l	4	NA	

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MSD	Chlorobenzene	ug/l	4	NA	
MSD	Chloroform (Trichloromethane)	ug/l	4	NA	
MSD	Trichloroethylene (TCE)	ug/L	4	NA	
MSD	Toluene	ug/l	4	NA	

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Sample# 940721006
Source: WAIPAHU III

Data Entry Comments

The spike recoveries of bromoform and 1,2,4-Trichlorobenzene (@VOASDWA)
are above the control limit of 120%(at 122%)in the LCS (@VOASDWA)
analyzed on 7/25/94. No significant impact on sample data. (@VOASDWA)
Reference QIR-MS-94-032. (@VOASDWA)

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for

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

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Sample # 940721007 Sample ID WAIPAHU III Project

Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Endothall	(ML/EPA 548)	ug/l	ND				5	24-jul-1994	llj	03-aug-1994	crh
Glyphosate	(ML/EPA 547)	ug/l	ND				6			28-jul-1994	dil

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Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Endothall	ug/l	25	28.7	115
LCS2	Endothall	ug/l	25	NA	
MBLK	Endothall	ug/l	ND	ND	
MS	Endothall	ug/l	25	30.1	120
LCS1	Glyphosate	ug/l	50	55.3	111
LCS2	Glyphosate	ug/l	50	45.7	91
MBLK	Glyphosate	ug/l	ND	ND	

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Sample # 940721007 Sample ID WAIPAHU III Project

Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Diquat and Paraquat (EPA 549)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Diquat	ug/l	ND				0.4	24-jul-1994	llj	26-jul-1994	dil
Paraquat	ug/l	ND				2	24-jul-1994	llj	26-jul-1994	dil

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Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Diquat and Paraquat (EPA 549)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Diquat	ug/l	5.0	4.56	91
LCS1	Paraquat	ug/l	10.0	8.37	84
LCS2	Diquat	ug/l	5.0	NA	
LCS2	Paraquat	ug/l	10.0	NA	
MBLK	Diquat	ug/l	ND	ND	
MBLK	Paraquat	ug/l	ND	ND	
MS	Diquat	ug/l	5.0	4.55	91
MS	Paraquat	ug/l	10.0	7.14	71
MSD	Diquat	ug/l	5.0	NA	
MSD	Paraquat	ug/l	10.0	NA	

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Aldicarbs (ML/EPA 531.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
3-Hydroxycarbofuran	ug/l	ND				2			26-jul-1994	dil
Aldicarb (Temik)	ug/l	ND				0.5			26-jul-1994	dil
Aldicarb sulfone	ug/l	ND				0.8			26-jul-1994	dil
Aldicarb sulfoxide	ug/l	ND				0.5			26-jul-1994	dil
Baygon	ug/l	ND				2			26-jul-1994	dil
Carbofuran (Furadan)	ug/l	ND				0.9			26-jul-1994	dil
Carbaryl	ug/l	ND				2			26-jul-1994	dil
Methiocarb	ug/l	ND				2			26-jul-1994	dil
Methomyl	ug/l	ND				2			26-jul-1994	dil
Oxamyl (Vydate)	ug/l	ND				2			26-jul-1994	dil

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Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Aldicarbs (ML/EPA 531.1)

Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
BDMC	97	80 - 120

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Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	21.6	108
LCS1	Aldicarb (Temik)	ug/l	20.0	20.3	102
LCS1	Aldicarb sulfone	ug/l	20.0	22.2	111
LCS1	Aldicarb sulfoxide	ug/l	20.0	23.9	120
LCS1	Baygon	ug/l	20.0	20.6	103
LCS1	Carbofuran (Furadan)	ug/l	20.0	20.4	102
LCS1	Carbaryl	ug/l	20.0	22.4	112
LCS1	Methiocarb	ug/l	20.0	22.7	114
LCS1	Methomyl	ug/l	20.0	20.2	101
LCS1	Oxamyl (Vydate)	ug/l	20.0	21.1	106
LCS2	3-Hydroxycarbofuran	ug/l	20.0	21.9	110
LCS2	Aldicarb (Temik)	ug/l	20.0	19.2	96
LCS2	Aldicarb sulfone	ug/l	20.0	22.8	114
LCS2	Aldicarb sulfoxide	ug/l	20.0	25.2	126
LCS2	Baygon	ug/l	20.0	20.9	104
LCS2	Carbofuran (Furadan)	ug/l	20.0	20.5	102
LCS2	Carbaryl	ug/l	20.0	22.7	114
LCS2	Methiocarb	ug/l	20.0	22.3	112
LCS2	Methomyl	ug/l	20.0	20.4	102
LCS2	Oxamyl (Vydate)	ug/l	20.0	22.0	110
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20	21.1	106

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Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (Temik)	ug/l	20	21.3	106
MS	Aldicarb sulfone	ug/l	20	20.7	104
MS	Aldicarb sulfoxide	ug/l	20	25.0	125
MS	Baygon	ug/l	20	20.7	104
MS	Carbofuran (Furadan)	ug/l	20	20.4	102
MS	Carbaryl	ug/l	20	22.4	112
MS	Methiocarb	ug/l	20	23.6	118
MS	Methomyl	ug/l	20	20.2	101
MS	Oxamyl (Vydate)	ug/l	20	21.2	106
MSD	3-Hydroxycarbofuran	ug/l	20	21.0	105
MSD	Aldicarb (Temik)	ug/l	20	21.2	106
MSD	Aldicarb sulfone	ug/l	20	20.8	104
MSD	Aldicarb sulfoxide	ug/l	20	26.0	130
MSD	Baygon	ug/l	20	20.7	104
MSD	Carbofuran (Furadan)	ug/l	20	20.4	102
MSD	Carbaryl	ug/l	20	22.6	113
MSD	Methiocarb	ug/l	20	24.4	122
MSD	Methomyl	ug/l	20	20.3	102
MSD	Oxamyl (Vydate)	ug/l	20	21.4	107

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ATTN: Ron Fenstemacher

Sample # 940721007 Sample ID WAIPAHU III Project

Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-aug-1994

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994	wpt
2,4,5-TP (Silvex)	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
2,4-D	ug/l	ND				0.1	22-jul-1994	wpt	26-jul-1994	wpt
2,4-DB	ug/l	ND				2	22-jul-1994	wpt	26-jul-1994	wpt
Dichlorprop	ug/l	ND				0.5	22-jul-1994	wpt	26-jul-1994	wpt
5-Hydroxydicamba	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
Acifluorfen (qualitative)	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
Bentazon	ug/l	ND				0.5	22-jul-1994	wpt	26-jul-1994	wpt
Chloramben (qualitative)	ug/l	ND				0.5	22-jul-1994	wpt	26-jul-1994	wpt
Dalapon (qualitative)	ug/l	ND				1	22-jul-1994	wpt	26-jul-1994	wpt
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	22-jul-1994	wpt	26-jul-1994	wpt
DCPA	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
Dicamba	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
Dinoseb	ug/l	ND				0.2	22-jul-1994	wpt	26-jul-1994	wpt
Pentachlorophenol	ug/l	0.07				0.04	22-jul-1994	wpt	26-jul-1994	wpt
Picloram	ug/l	ND				0.1	22-jul-1994	wpt	26-jul-1994	wpt
4-Nitrophenol (qualitative)	ug/l	ND				5	22-jul-1994	wpt	26-jul-1994	wpt
Data Entry	--	07/28/94				0	22-jul-1994	wpt	26-jul-1994	wpt

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Sample # 940721007 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	89	70 - 130

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Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.62	124
LCS1	2,4-D	ug/l	1.00	0.98	98
LCS1	Bentazon	ug/l	1.00	1.01	101
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.42	84
MS	2,4-D	ug/l	1.00	0.95	95
MS	Bentazon	ug/l	1.00	0.77	77
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

Report #: 14570

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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 14572

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555 East Walnut Street
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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721009 Sample ID WAIPAHU III Project

Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 02-aug-1994

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Cyanide (EPA/SM 335.3)	mg/l	0.006				0.005			24-Jul-1994	mbm

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721009 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 02-aug-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Cyanide	mg/l	0.05	0.0483	97
LCS2	Cyanide	mg/l	0.05	0.0565	113
MBLK	Cyanide	mg/l	ND	ND	
MS	Cyanide	mg/l	0.05	0.0531	106
MSD	Cyanide	mg/l	0.05	0.0486	97

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Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940721009 Sample ID WAIPAHU III Project

Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 02-aug-1994

Gross Alpha and Beta Radiation (ML/EPA 900.0)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Alpha, Gross	pCi/l	2.6				5			28-Jul-1994	gub
Alpha, Two Sigma Error	pCi/l	1.4				0			28-Jul-1994	gub
Beta, Gross	pCi/l	6.0				5			28-Jul-1994	gub
Beta, Two Sigma Error	pCi/l	1.0				0			28-Jul-1994	gub

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Sample # 940721009 Sample ID WAIPAHU III Project
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 02-aug-1994

Gross Alpha and Beta Radiation (ML/EPA 900.0)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Alpha, Gross	pCi/l	9.2	10.0	109
LCS1	Beta, Gross	pCi/l	28.1	31.2	111
LCS2	Alpha, Gross	pCi/l	9.2	9.8	107
LCS2	Beta, Gross	pCi/l	28.1	29.8	106

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#2

Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 15299

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project

Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Dibromochloropropane (DBCP)	ug/l	ND				0.01	29-aug-1994	hth	30-aug-1994	hth
Ethylene Dibromide (EDB)	ug/l	0.03				0.01	29-aug-1994	hth	30-aug-1994	hth
Data Entry	--	08/30/94				0	29-aug-1994	hth	30-aug-1994	hth

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.12	120
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
MS	Ethylene Dibromide (EDB)	ug/l	0.10	0.09	90

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Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
alpha-Chlordane	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Acenaphthylene	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Alachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Aldrin	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Anthracene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Atrazine	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benz(a)Anthracene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benzo(a)pyrene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	30-aug-1994	csk	01-sep-1994	crw
Butylbenzylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Bromacil	ug/l	ND				2	30-aug-1994	csk	01-sep-1994	crw
Butachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Chrysene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	30-aug-1994	csk	01-sep-1994	crw
Diethylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Diazinon	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Dieldrin	ug/l	ND				0.2	30-aug-1994	csk	01-sep-1994	crw
Dimethylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Dimethoate	ug/l	ND				10	30-aug-1994	csk	01-sep-1994	crw
Di-n-Butylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Endrin	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Fluorene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
gamma-Chlordane	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Hexachlorobenzene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Hexachlorocyclopentadiene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.04	30-aug-1994	csk	01-sep-1994	crw
Heptachlor Epoxide	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Indeno(1,2,3-c,d)Pyrene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Isophorone	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Lindane	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Methoxychlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Metribuzin	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Molinate	ug/l	ND				0.2	30-aug-1994	csk	01-sep-1994	crw
Metolachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
trans-Nonachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Pentachlorophenol	ug/l	ND				1	30-aug-1994	csk	01-sep-1994	crw
Phenanthrene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Prometryn	mg/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Propachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Pyrene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Simazine	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Thiobencarb	ug/l	ND				0.2	30-aug-1994	csk	01-sep-1994	crw
Trifluralin	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	88	70 - 130

Report #: 15299

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ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	2.50	125
LCS1	Acenaphthylene	ug/l	2	1.93	96
LCS1	Alachlor	ug/l	2	2.41	120
LCS1	Aldrin	ug/l	2	2.13	106
LCS1	Anthracene	ug/l	2	1.75	88
LCS1	Atrazine	ug/l	2	2.28	114
LCS1	Benz(a)Anthracene	ug/l	2	1.81	90
LCS1	Benzo(a)pyrene	ug/l	2	1.76	88
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.89	94
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.98	99
LCS1	Benzo(k)Fluoranthene	ug/l	2	2.05	102
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	2.27	114
LCS1	Butylbenzylphthalate	ug/l	2	1.90	95
LCS1	Chrysene	ug/l	2	1.84	92
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.92	96
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	1.96	98
LCS1	Diethylphthalate	ug/l	2	2.33	116
LCS1	Dimethylphthalate	ug/l	2	2.11	106
LCS1	Di-n-Butylphthalate	ug/l	2	2.47	124
LCS1	Endrin	ug/l	2	1.71	86
LCS1	Fluorene	ug/l	2	2.08	104
LCS1	gamma-Chlordane	ug/l	2	2.29	114
LCS1	Hexachlorobenzene	ug/l	2	1.92	96
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.32	66
LCS1	Heptachlor	ug/l	2	1.91	96
LCS1	Heptachlor Epoxide	ug/l	2	2.18	109
LCS1	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.74	87
LCS1	Lindane	ug/l	2	1.94	97
LCS1	Methoxychlor	ug/l	2	2.09	104
LCS1	Molinate	ug/l	2	2.31	116
LCS1	trans-Nonachlor	ug/l	2	2.14	107

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	8	8.79	110
LCS1	Phenanthrene	ug/l	2	2.03	102
LCS1	Pyrene	ug/l	2	2.32	116
LCS1	Simazine	ug/l	2	2.31	116
LCS1	Thiobencarb	ug/l	2	2.38	119
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Bis(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	mg/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	1.88	94
MS	Acenaphthylene	ug/l	2	1.83	92
MS	Alachlor	ug/l	2	2.34	117
MS	Aldrin	ug/l	2	2.07	104
MS	Anthracene	ug/l	2	1.03	52
MS	Atrazine	ug/l	2	2.19	110
MS	Benz(a)Anthracene	ug/l	2	1.62	81
MS	Benzo(a)pyrene	ug/l	2	1.79	90
MS	Benzo(b)Fluoranthene	ug/l	2	2.19	110
MS	Benzo(g,h,i)Perylene	ug/l	2	2.26	113

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(k)Fluoranthene	ug/l	2	2.20	110
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	2.84	142
MS	Butylbenzylphthalate	ug/l	2	2.40	120
MS	Chrysene	ug/l	2	1.95	98
MS	Dibenz(a,h)Anthracene	ug/l	2	2.31	116
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	2.48	124
MS	Diethylphthalate	ug/l	2	2.13	106
MS	Dimethylphthalate	ug/l	2	2.16	108
MS	Di-n-Butylphthalate	ug/l	2	2.30	115
MS	Endrin	ug/l	2	2.12	106
MS	Fluorene	ug/l	2	1.90	95
MS	gamma-Chlordane	ug/l	2	2.18	109
MS	Hexachlorobenzene	ug/l	2	1.91	96
MS	Hexachlorocyclopentadiene	ug/l	2	1.30	65
MS	Heptachlor	ug/l	2	1.96	98
MS	Heptachlor Epoxide	ug/l	2	2.05	102
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	2.24	112
MS	Lindane	ug/l	2	1.87	94
MS	Methoxychlor	ug/l	2	2.38	119
MS	Molinate	ug/l	2	2.20	110
MS	trans-Nonachlor	ug/l	2	2.13	106
MS	Pentachlorophenol	ug/l	8	10.3	129
MS	Phenanthrene	ug/l	2	1.96	98
MS	Pyrene	ug/l	2	2.16	108
MS	Simazine	ug/l	2	2.07	104
MS	Thiobencarb	ug/l	2	2.31	116

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1,2-Tetrachloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,1-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,2,2-Tetrachloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,2-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloropropene	ug/l	ND				0.5			30-aug-1994	col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,3-Trichloropropane	ug/l	ND				0.5			30-aug-1994	col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,4-Trimethylbenzene	ug/l	ND				0.5			30-aug-1994	col
1,2-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,2-Dichloropropane	ug/l	ND				0.5			30-aug-1994	col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			30-aug-1994	col
1,3-Dichloropropene	ug/l	ND				0.5			30-aug-1994	col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			30-aug-1994	col
2,2-Dichloropropane	ug/l	ND				5			30-aug-1994	col
2-Butanone (MEK)	ug/l	ND				1			30-aug-1994	col
2-Chloroethylvinylether	ug/l	ND				0.5			30-aug-1994	col
o-Chlorotoluene	ug/l	ND				0.5			30-aug-1994	col
p-Chlorotoluene	ug/l	ND				5			30-aug-1994	col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				0.5			30-aug-1994	col
Benzene	ug/l	ND				0.5			30-aug-1994	col
Bromobenzene	ug/l	ND				0.5			30-aug-1994	col
Bromomethane (Methyl Bromide)	ug/l	ND				0.5			30-aug-1994	col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
Chlorobenzene	ug/l	ND				0.5			30-aug-1994	col
Carbon Tetrachloride	ug/l	ND				0.5			30-aug-1994	col
cis-1,3-Dichloropropene	ug/l	ND				0.2			30-aug-1994	col

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Honolulu, City of
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ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Bromoform	ug/l	ND				0.5			30-aug-1994	col
Chloroform (Trichloromethane)	ug/l	ND				0.5			30-aug-1994	col
Bromochloromethane	ug/l	ND				0.5			30-aug-1994	col
Chloroethane	ug/l	ND				0.5			30-aug-1994	col
Chloromethane(Methyl Chloride)	ug/l	ND				0.5			30-aug-1994	col
Chlorodibromomethane	ug/l	ND				0.5			30-aug-1994	col
Dibromomethane	ug/l	ND				0.5			30-aug-1994	col
Bromodichloromethane	ug/l	ND				0.5			30-aug-1994	col
Dichloromethane	ug/l	ND				0.5			30-aug-1994	col
Ethyl benzene	ug/l	ND				0.5			30-aug-1994	col
Dichlorodifluoromethane	ug/l	ND				0.5			30-aug-1994	col
Fluorotrichloromethane(Freon1)	ug/l	ND				0.5			30-aug-1994	col
Hexachlorobutadiene	ug/l	ND				0.5			30-aug-1994	col
Isopropylbenzene	ug/l	ND				0.5			30-aug-1994	col
m-Dichlorobenzene (1,3-DCB)	ug/l	ND				0.5			30-aug-1994	col
m,p-Xylenes	ug/l	ND				0.5			30-aug-1994	col
Naphthalene	ug/l	ND				0.5			30-aug-1994	col
n-Butylbenzene	ug/l	ND				0.5			30-aug-1994	col
n-Propylbenzene	ug/l	ND				0.5			30-aug-1994	col
o-Xylene	ug/l	ND				0.5			30-aug-1994	col
o-Dichlorobenzene (1,2-DCB)	ug/l	ND				0.5			30-aug-1994	col
Tetrachloroethylene (PCE)	ug/l	ND				0.5			30-aug-1994	col
p-Isopropyltoluene	ug/l	ND				0.5			30-aug-1994	col
sec-Butylbenzene	ug/l	ND				0.5			30-aug-1994	col
Styrene	ug/l	ND				0.5			30-aug-1994	col
trans-1,2-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
tert-Butylbenzene	ug/l	ND				0.5			30-aug-1994	col
Trichloroethylene (TCE)	ug/l	ND				0.5			30-aug-1994	col
Trichlorotrifluoroethane(Freon	ug/l	ND				0.5			30-aug-1994	col

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project

Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
trans-1,3-Dichloropropene	ug/l	ND				0.5			30-aug-1994	col
Toluene	ug/l	ND				0.5			30-aug-1994	col
Vinyl chloride (VC)	ug/l	ND				0.5			30-aug-1994	col
Data Entry	--	ND				0			30-aug-1994	col

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Toluene-d8	95	80 - 120
1,2-Dichloroethane-d4	100	80 - 120
4-Bromofluorobenzene	102	80 - 120

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1-Dichloroethylene	ug/l	4	3.37	84
LCS1	1,2,4-Trichlorobenzene	ug/l	4	4.80	120
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.74	94
LCS1	p-Chlorotoluene	ug/l	4	3.72	93
LCS1	Benzene	ug/l	4	4.10	102
LCS1	Chlorobenzene	ug/l	4	4.18	104
LCS1	Chloroform (Trichloromethane)	ug/l	4	3.73	93
LCS1	Trichloroethylene (TCE)	ug/l	4	3.84	96
LCS1	Toluene	ug/l	4	4.02	100
LCS2	1,1-Dichloroethylene	ug/l	4	4.09	102
LCS2	1,2,4-Trichlorobenzene	ug/l	4	4.42	110
LCS2	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.15	104
LCS2	p-Chlorotoluene	ug/l	4	4.35	109
LCS2	Benzene	ug/l	4	4.39	110
LCS2	Chlorobenzene	ug/l	4	4.52	113
LCS2	Chloroform (Trichloromethane)	ug/l	4	4.21	105
LCS2	Trichloroethylene (TCE)	ug/l	4	4.48	112
LCS2	Toluene	ug/l	4	4.48	112
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	

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Laboratory Report

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane(Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane(Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	

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Laboratory Report

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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane(Freon	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

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Laboratory Report

for

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 15300

MONTGOMERY LABORATORIES
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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Cadmium, Total, GF	(HL/EPA200.2)	mg/l	ND				0.001	31-aug-1994	wlm	31-aug-1994	wlm
Mercury	(HL/EPA 245.1)	ug/l	ND				0.2	31-aug-1994	eyw	31-aug-1994	eyw

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0101	101
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0111	111
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.01	0.0114	114
MSD	Cadmium, Total, GF	mg/l	0.01	0.0116	116
LCS1	Mercury	ug/l	1.50	1.35	90
LCS2	Mercury	ug/l	1.50	1.28	85
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.52	101
MSD	Mercury	ug/l	1.50	1.45	97

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Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project

Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarbs (ML/EPA 531.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
3-Hydroxycarbofuran	ug/l	ND				2			31-aug-1994	dil
Aldicarb (Temik)	ug/l	ND				0.5			31-aug-1994	dil
Aldicarb sulfone	ug/l	ND				0.8			31-aug-1994	dil
Aldicarb sulfoxide	ug/l	ND				0.5			31-aug-1994	dil
Baygon	ug/l	ND				2			31-aug-1994	dil
Carbofuran (Furadan)	ug/l	ND				0.9			31-aug-1994	dil
Carbaryl	ug/l	ND				2			31-aug-1994	dil
Methiocarb	ug/l	ND				2			31-aug-1994	dil
Methomyl	ug/l	ND				2			31-aug-1994	dil
Oxamyl (Vydate)	ug/l	ND				2			31-aug-1994	dil

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarbs (ML/EPA 531.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
BDMC	90	80 - 120

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarbs (ML/EPA 531.1)

Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	21.0	105
LCS1	Aldicarb (Temik)	ug/l	20.0	19.9	100
LCS1	Aldicarb sulfone	ug/l	20.0	21.6	108
LCS1	Aldicarb sulfoxide	ug/l	20.0	23.6	118
LCS1	Baygon	ug/l	20.0	20.2	101
LCS1	Carbofuran (Furadan)	ug/l	20.0	20.0	100
LCS1	Carbaryl	ug/l	20.0	20.8	104
LCS1	Methiocarb	ug/l	20.0	19.7	98
LCS1	Methomyl	ug/l	20.0	19.8	99
LCS1	Oxamyl (Vydate)	ug/l	20.0	20.5	102
LCS2	3-Hydroxycarbofuran	ug/l	20.0	21.1	106
LCS2	Aldicarb (Temik)	ug/l	20.0	19.7	98
LCS2	Aldicarb sulfone	ug/l	20.0	21.8	109
LCS2	Aldicarb sulfoxide	ug/l	20.0	23.9	120
LCS2	Baygon	ug/l	20.0	20.5	102
LCS2	Carbofuran (Furadan)	ug/l	20.0	20.2	101
LCS2	Carbaryl	ug/l	20.0	21.9	110
LCS2	Methiocarb	ug/l	20.0	21.1	106
LCS2	Methomyl	ug/l	20.0	20.1	100
LCS2	Oxamyl (Vydate)	ug/l	20.0	20.9	104
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20.0	20.5	102

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Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (Temik)	ug/l	20.0	20.1	100
MS	Aldicarb sulfone	ug/l	20.0	20.6	103
MS	Aldicarb sulfoxide	ug/l	20.0	20.1	100
MS	Baygon	ug/l	20.0	20.6	103
MS	Carbofuran (Furadan)	ug/l	20.0	20.5	102
MS	Carbaryl	ug/l	20.0	20.6	103
MS	Methiocarb	ug/l	20.0	21.1	106
MS	Methomyl	ug/l	20.0	20.3	102
MS	Oxamyl (Vydate)	ug/l	20.0	20.5	102
MSD	3-Hydroxycarbofuran	ug/l	20.0	20.7	104
MSD	Aldicarb (Temik)	ug/l	20.0	20.4	102
MSD	Aldicarb sulfone	ug/l	20.0	20.5	102
MSD	Aldicarb sulfoxide	ug/l	20.0	20.1	100
MSD	Baygon	ug/l	20.0	20.5	102
MSD	Carbofuran (Furadan)	ug/l	20.0	20.4	102
MSD	Carbaryl	ug/l	20.0	20.8	104
MSD	Methiocarb	ug/l	20.0	21.7	108
MSD	Methomyl	ug/l	20.0	20.2	101
MSD	Oxamyl (Vydate)	ug/l	20.0	20.5	102

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
2,4,5-TP (Silvex)	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
2,4-D	ug/l	ND				0.1	29-aug-1994	rey	02-sep-1994	wpt
2,4-DB	ug/l	ND				2	29-aug-1994	rey	02-sep-1994	wpt
Dichlorprop	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994	wpt
5-Hydroxydicamba	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
Acifluorfen (qualitative)	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
Bentazon	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994	wpt
Chloramben (qualitative)	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994	wpt
Dalapon (qualitative)	ug/l	ND				1	29-aug-1994	rey	02-sep-1994	wpt
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	29-aug-1994	rey	02-sep-1994	wpt
DCPA	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
Dicamba	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
Dinoseb	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994	wpt
Pentachlorophenol	ug/l	ND				0.04	29-aug-1994	rey	02-sep-1994	wpt
Picloram	ug/l	ND				0.1	29-aug-1994	rey	02-sep-1994	wpt
4-Nitrophenol (qualitative)	ug/l	ND				5	29-aug-1994	rey	02-sep-1994	wpt
Data Entry	--	09/06/94				0	29-aug-1994	rey	02-sep-1994	wpt

Report #: 15300

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Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	105	70 - 130

Report #: 15300

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ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.58	116
LCS1	2,4-D	ug/l	1.00	1.01	101
LCS1	Bentazon	ug/l	1.00	1.17	117
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.72	144
MS	2,4-D	ug/l	1.00	1.23	123
MS	Bentazon	ug/l	1.00	1.33	133
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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Laboratory Report

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ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 1016 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1221 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1232 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1242 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1248 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1254 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
PCB 1260 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
Alpha-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Alachlor (Alanex)	ug/l	ND				0.05	01-sep-1994	csk	07-sep-1994	kah
Aldrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Beta-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Chlordane	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994	kah
Chlorthalonil (Dreonil, Bravo)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Delta-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
P,P' DDD	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
p,p' DDE	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
P,P' DDT	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Dieldrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Endrin Aldehyde	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Endrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Endosulfan I (alpha)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Endosulfan II (beta)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Endosulfan sulfate	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Heptachlor	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Heptachlor Epoxide	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Lindane (gamma-BHC)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Methoxychlor	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994	kah
Toxaphene	ug/l	ND				0.05	01-sep-1994	csk	07-sep-1994	kah
Data Entry		09/09/94				0.5	01-sep-1994	csk	07-sep-1994	kah

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	96	70 - 130

Report #: 15300

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Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.05	100
LCS1	p,p' DDT	ug/l	0.10	0.10	100
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.09	90
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.04	80
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.05	100
MS	P,P' DDT	ug/l	0.10	0.10	100
MS	Dieldrin	ug/l	0.10	0.11	110
MS	Endrin	ug/l	0.10	0.09	90
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.04	80

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Draft #1 of 2

MINERAL ANALYSES

AREA			
LOCATION	Waipahu III - Well #1 (2460-09)	Waipahu III - Well #17 (2400-10)	
Year	1994	1994	
Date collected	July 20	Aug. 25	
Time collected	0940	0925	
Laboratory number	—	—	
Regional head, feet	—	—	
Specific conductance micromhos @ 25°C	289	322	
pH value	7.37	7.55	
Turbidity	0.09	0.16	
Color	0	0	
IN PARTS PER MILLION:			
Dissolved oxygen	—	—	
Free carbon dioxide	—	—	
Silica	40	44	
Calcium	6.2	6.6	
Magnesium	6.9	7.0	
Sodium	38	47	
Potassium	2.1	2.2	
Bicarbonate	62	43	
Sulfate	15	14	
Chloride	36	34	
Fluoride	0.10	0.10	
Nitrate	13	13	
Phosphate	0.85	0.80	
Iron	0.01	0.01	
Manganese	.01	.01	
Copper	.01	.01	
Lead	.01	.01	
Arsenic	.01	.01	
Selenium	.01	.01	
Chromium[a]			
Total dissolved solids			
Alkalinity			
Total hardness			
IN EQUIVALENTS PER			
Calcium (Ca)			
Magnesium (Mg)			
Sodium (Na)			
Potassium			
Bicarbo			
Sulfa			
Chl			
Ni			

..... less than .....

Barium
Cadmium

CORRECTION

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

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III'HOLE #2 Project
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.05	100
MS	p,p' DDT	ug/l	0.10	0.10	100
MS	Dieldrin	ug/l	0.10	0.11	110
MS	Endrin	ug/l	0.10	0.09	90
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.04	80

Report #: 15300

Draft #1 & 2

MINERAL ANALYSES

AREA			
LOCATION	Waipahu III - Well #1 (2400-09)	Waipahu III - Well #7 (2400-10)	
Year	1994	1994	
Date collected	July 20	Aug. 25	
Time collected	0940	0925	
Laboratory number	—	—	
Regional head, feet	—	—	
Specific conductance micromhos @ 25°C	289	377	
pH value	7.37	7.55	
Turbidity	0.09	0.16	
Color	0	0	
IN PARTS PER MILLION:			
Dissolved oxygen	—	—	
Free carbon dioxide	—	—	
Silica	40	44	
Calcium	6.2	6.6	
Magnesium	6.9	7.0	
Sodium	38	47	
Potassium	2.1	2.2	
Bicarbonate	62	93	
Sulfate	15	14	
Chloride	36	34	
Fluoride	0.10	0.10	
Nitrate	13	13	
Phosphate	0.85	0.80	
Iron)	0.01	0.01	
Manganese)	.01	.01	
Copper)	.01	.01	
Lead) ..... less than	.01	.01	
Arsenic)	.01	.01	
Selenium)	.01	.01	
Chromium[a])	.01	.01	
Total dissolved solids	220	248	
Alkalinity	51	76	
Total hardness	44	45	
IN EQUIVALENTS PER MILLION:			
Calcium (Ca)	0.309	0.329	
Magnesium (Mg)	.567	.576	
Sodium (Na)	1.655	2.054	
Potassium (K)	.054	.056	
Bicarbonate (HCO_3)	1.016	1.525	
Sulfate (SO_4)	.312	.291	
Chloride (Cl)[b]	1.047	.989	
Nitrate (NO_3)	.210	.210	
TOTALS	5.170	6.030	

a Hexavalent only.
b Includes fluoride and phosphate as PO_4.

Silver)	.01	.01
Barium) ..... less than	.01	.01
Cadmium)	.01	.01

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#3

Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 16364

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Dibromochloropropane (DBCP)	ug/l	ND				0.01	22-oct-1994	hth	23-oct-1994	hth
Ethylene Dibromide (EDB)	ug/l	0.02				0.01	22-oct-1994	hth	23-oct-1994	hth
Data Entry	-	10/24/94				0	22-oct-1994	hth	23-oct-1994	hth

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ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.11	110
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.09	90
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
MS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

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ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID HAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
alpha-Chlordane	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Acenaphthylene	ug/l	ND				0.1	24-oct-1994	csk	27-oct-1994	crw
Alachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Aldrin	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Anthracene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Atrazine	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Benz(a)Anthracene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Benzo(a)pyrene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	24-oct-1994	csk	27-oct-1994	crw
Butylbenzylphthalate	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Bromacil	ug/l	ND				2	24-oct-1994	csk	27-oct-1994	crw
Butachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Chrysene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	24-oct-1994	csk	27-oct-1994	crw
Diethylphthalate	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Diazinon	ug/l	ND				0.1	24-oct-1994	csk	27-oct-1994	crw
Dieldrin	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Dimethylphthalate	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Dimethoate	ug/l	ND				10	24-oct-1994	csk	27-oct-1994	crw
Di-n-Butylphthalate	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Endrin	ug/l	ND				0.1	24-oct-1994	csk	27-oct-1994	crw
Fluorene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
gamma-Chlordane	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Hexachlorobenzene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Hexachlorocyclopentadiene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.04	24-oct-1994	csk	27-oct-1994	crw
Heptachlor Epoxide	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Indeno(1,2,3,c,d)Pyrene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Isophorone	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Lindane	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Methoxychlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Metribuzin	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Molinate	ug/l	ND				0.2	24-oct-1994	csk	27-oct-1994	crw
Metolachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
trans-Nonachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Pentachlorophenol	ug/l	ND				1	24-oct-1994	csk	27-oct-1994	crw
Phenanthrene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	crw
Prometryn	mg/l	ND				0.5	24-oct-1994	csk	27-oct-1994	crw
Propachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Pyrene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Simazine	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	crw
Thiobencarb	ug/l	ND				0.2	24-oct-1994	csk	27-oct-1994	crw
Trifluralin	ug/l	ND				0.1	24-oct-1994	csk	27-oct-1994	crw

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Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	90	70 - 130

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Alpha-Chlordane	ug/l	2	1.93	96
LCS1	Acenaphthylene	ug/l	2	1.90	95
LCS1	Alachlor	ug/l	2	1.98	99
LCS1	Aldrin	ug/l	2	1.88	94
LCS1	Anthracene	ug/l	2	1.85	92
LCS1	Atrazine	ug/l	2	1.92	96
LCS1	Benz(a)Anthracene	ug/l	2	1.77	88
LCS1	Benzo(a)pyrene	ug/l	2	1.92	96
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.95	98
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.95	98
LCS1	Benzo(k)Fluoranthene	ug/l	2	1.80	90
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	1.73	86
LCS1	Butylbenzylphthalate	ug/l	2	1.80	90
LCS1	Chrysene	ug/l	2	1.82	91
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.85	92
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	2.20	110
LCS1	Diethylphthalate	ug/l	2	1.90	95
LCS1	Dimethylphthalate	ug/l	2	1.96	98
LCS1	Di-n-Butylphthalate	ug/l	2	1.71	86
LCS1	Endrin	ug/l	2	1.67	84
LCS1	Fluorene	ug/l	2	1.82	91
LCS1	gamma-Chlordane	ug/l	2	1.92	96
LCS1	Hexachlorobenzene	ug/l	2	1.85	92
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.61	80
LCS1	Heptachlor	ug/l	2	1.75	88
LCS1	Heptachlor Epoxide	ug/l	2	1.90	95
LCS1	Indeno(1,2,3-c,d)Pyrene	ug/l	2	1.83	92
LCS1	Lindane	ug/l	2	1.87	94
LCS1	Methoxychlor	ug/l	2	1.71	86
LCS1	Molinate	ug/l	2	1.93	96
LCS1	trans-Nonachlor	ug/l	2	1.88	94

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	8	6.43	80
LCS1	Phenanthrene	ug/l	2	1.89	94
LCS1	Pyrene	ug/l	2	1.92	96
LCS1	Simazine	ug/l	2	1.88	94
LCS1	Thiobencarb	ug/l	2	1.85	92
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)Pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	mg/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.04	102
MS	Acenaphthylene	ug/l	2	1.74	87
MS	Alachlor	ug/l	2	2.18	109
MS	Aldrin	ug/l	2	1.73	86
MS	Anthracene	ug/l	2	0.37	18
MS	Atrazine	ug/l	2	2.01	100
MS	Benz(a)Anthracene	ug/l	2	1.39	70
MS	Benzo(a)pyrene	ug/l	2	0.92	46
MS	Benzo(b)Fluoranthene	ug/l	2	2.05	102
MS	Benzo(g,h,i)Perylene	ug/l	2	1.85	92

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)fluoranthene	ug/l	2	1.90	95
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.90	95
MS	Butylbenzylphthalate	ug/l	2	1.81	90
MS	Chrysene	ug/l	2	1.89	94
MS	Dibenz(a,h)Anthracene	ug/l	2	1.82	91
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.57	78
MS	Diethylphthalate	ug/l	2	2.18	109
MS	Dimethylphthalate	ug/l	2	2.20	110
MS	Di-n-Butylphthalate	ug/l	2	2.04	102
MS	Endrin	ug/l	2	1.69	84
MS	Fluorene	ug/l	2	2.04	102
MS	gamma-Chlordane	ug/l	2	2.06	103
MS	Hexachlorobenzene	ug/l	2	1.82	91
MS	Hexachlorocyclopentadiene	ug/l	2	0.36	18
MS	Heptachlor	ug/l	2	1.72	86
MS	Heptachlor Epoxide	ug/l	2	1.98	99
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.77	88
MS	Lindane	ug/l	2	1.94	97
MS	Methoxychlor	ug/l	2	1.75	88
MS	Molinate	ug/l	2	2.23	112
MS	trans-Nonachlor	ug/l	2	1.86	93
MS	Pentachlorophenol	ug/l	8	8.04	100
MS	Phenanthrene	ug/l	2	1.90	95
MS	Pyrene	ug/l	2	1.98	99
MS	Simazine	ug/l	2	2.08	104
MS	Thiobencarb	ug/l	2	1.97	98

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Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1,2-Tetrachloroethane	ug/l	ND				0.5			01-nov-1994	col
1,1,1-Trichloroethane	ug/l	ND				0.5			01-nov-1994	col
1,1,2,2-Tetrachloroethane	ug/l	ND				0.5			01-nov-1994	col
1,1,2-Trichloroethane	ug/l	ND				0.5			01-nov-1994	col
1,1-Dichloroethane	ug/l	ND				0.5			01-nov-1994	col
1,1-Dichloroethylene	ug/l	ND				0.5			01-nov-1994	col
1,1-Dichloropropene	ug/l	ND				0.5			01-nov-1994	col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			01-nov-1994	col
1,2,3-Trichloropropane	ug/l	ND				0.5			01-nov-1994	col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			01-nov-1994	col
1,2,4-Trimethylbenzene	ug/l	ND				0.5			01-nov-1994	col
1,2-Dichloroethane	ug/l	ND				0.5			01-nov-1994	col
1,2-Dichloropropane	ug/l	ND				0.5			01-nov-1994	col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			01-nov-1994	col
1,3-Dichloropropane	ug/l	ND				0.5			01-nov-1994	col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			01-nov-1994	col
2,2-Dichloropropane	ug/l	ND				0.5			01-nov-1994	col
2-Butanone (MEK)	ug/l	ND				5			01-nov-1994	col
2-Chloroethylvinylether	ug/l	ND				1			01-nov-1994	col
o-Chlorotoluene	ug/l	ND				0.5			01-nov-1994	col
p-Chlorotoluene	ug/l	ND				0.5			01-nov-1994	col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			01-nov-1994	col
Benzene	ug/l	ND				0.5			01-nov-1994	col
Bromobenzene	ug/l	ND				0.5			01-nov-1994	col
Bromomethane (Methyl Bromide)	ug/l	ND				0.5			01-nov-1994	col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			01-nov-1994	col
Chlorobenzene	ug/l	ND				0.5			01-nov-1994	col
Carbon Tetrachloride	ug/l	ND				0.5			01-nov-1994	col
cis-1,3-Dichloropropene	ug/l	ND				0.2			01-nov-1994	col

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Sample # 941021265 Sample ID HAIPAHU WELL III G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Bromoform	ug/l	ND				0.5			01-nov-1994	col
Chloroform (Trichloromethane)	ug/l	ND				0.5			01-nov-1994	col
Bromochloromethane	ug/l	ND				0.5			01-nov-1994	col
Chloroethane	ug/l	ND				0.5			01-nov-1994	col
Chloromethane(Methyl Chloride)	ug/l	ND				0.5			01-nov-1994	col
Chlorodibromomethane	ug/l	ND				0.5			01-nov-1994	col
Dibromomethane	ug/l	ND				0.5			01-nov-1994	col
Bromodichloromethane	ug/l	ND				0.5			01-nov-1994	col
Dichloromethane	ug/l	ND				0.5			01-nov-1994	col
Ethyl benzene	ug/l	ND				0.5			01-nov-1994	col
Dichlorodifluoromethane	ug/l	ND				0.5			01-nov-1994	col
Fluorotrichloromethane(Freon1)	ug/l	ND				0.5			01-nov-1994	col
Hexachlorobutadiene	ug/l	ND				0.5			01-nov-1994	col
Isopropylbenzene	ug/l	ND				0.5			01-nov-1994	col
m-Dichlorobenzene (1,3-DCB)	ug/l	ND				0.5			01-nov-1994	col
m,p-Xylenes	ug/l	ND				0.5			01-nov-1994	col
Naphthalene	ug/l	ND				0.5			01-nov-1994	col
n-Butylbenzene	ug/l	ND				0.5			01-nov-1994	col
n-Propylbenzene	ug/l	ND				0.5			01-nov-1994	col
o-Xylene	ug/l	ND				0.5			01-nov-1994	col
o-Dichlorobenzene (1,2-DCB)	ug/l	ND				0.5			01-nov-1994	col
Tetrachloroethylene (PCE)	ug/l	ND				0.5			01-nov-1994	col
p-Isopropyltoluene	ug/l	ND				0.5			01-nov-1994	col
sec-Butylbenzene	ug/l	ND				0.5			01-nov-1994	col
Styrene	ug/l	ND				0.5			01-nov-1994	col
trans-1,2-Dichloroethylene	ug/l	ND				0.5			01-nov-1994	col
tert-Butylbenzene	ug/l	ND				0.5			01-nov-1994	col
Trichloroethylene (TCE)	ug/l	ND				0.5			01-nov-1994	col
Trichlorotrifluoroethane(Freon	ug/l	ND				0.5			01-nov-1994	col

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Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
trans-1,3-Dichloropropene	ug/l	ND				0.5			01-nov-1994	col
Toluene	ug/l	ND				0.5			01-nov-1994	col
Vinyl chloride (VC)	ug/l	ND				0.5			01-nov-1994	col
Data Entry	--	11/04/94				0			01-nov-1994	col

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
4-Bromofluorobenzene	100	80 - 120
Toluene-d8	95	80 - 120
1,2-Dichloroethane-d4	109	80 - 120

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Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1,1-Trichloroethane	ug/l	4	3.83	96
LCS1	1,1,2,2-Tetrachloroethane	ug/l	4	3.87	97
LCS1	1,1,2-Trichloroethane	ug/l	4	3.79	95
LCS1	1,1-Dichloroethane	ug/l	4	4.11	103
LCS1	1,2,4-Trichlorobenzene	ug/l	4	3.79	95
LCS1	1,2-Dichloroethane	ug/l	4	3.92	98
LCS1	1,2-Dichloropropane	ug/l	4	3.84	96
LCS1	1,3-Dichloropropane	ug/l	8	7.45	93
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.55	89
LCS1	Benzene	ug/l	4	4.13	103
LCS1	cis-1,2-Dichloroethylene	ug/l	4	3.83	96
LCS1	Chlorobenzene	ug/l	4	3.86	96
LCS1	Carbon Tetrachloride	ug/l	4	3.92	98
LCS1	Bromoform	ug/l	4	3.60	90
LCS1	Chloroform (Trichloromethane)	ug/l	4	3.68	92
LCS1	Bromodichloromethane	ug/l	4	3.39	85
LCS1	Dichloromethane	ug/l	4	4.10	102
LCS1	Ethyl benzene	ug/l	4	4.22	106
LCS1	Fluorotrichloromethane(freon1)	ug/l	4	4.80	120
LCS1	m,p-Xylenes	ug/l	8	8.02	100
LCS1	o-Xylene	ug/l	4	3.89	97
LCS1	o-Dichlorobenzene (1,2-DCB)	ug/l	4	3.53	88
LCS1	Tetrachloroethylene (PCE)	ug/l	4	3.80	95
LCS1	Styrene	ug/l	4	4.04	101
LCS1	trans-1,2-Dichloroethylene	ug/l	4	3.92	98
LCS1	Trichloroethylene (TCE)	ug/l	4	3.87	97
LCS1	Trichlorotrifluoroethane(freon	ug/l	4	5.38	134
LCS1	Toluene	ug/l	4	4.00	100
LCS1	Vinyl chloride (VC)	ug/l	4	4.24	106
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Chloromethane(Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane(Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane(Freon	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

Report#: 16365

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Barium, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.02			27-oct-1994	jps
Beryllium, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.001			27-oct-1994	jps
Cadmium, Total, GF	(HL/EPA206.2)	mg/l	ND				0.001	31-oct-1994	wlm	31-oct-1994	wlm
Mercury	(HL/EPA 245.1)	ug/l	ND				0.2	25-oct-1994	eyw	26-oct-1994	eyw
Nickel, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.01			27-oct-1994	jps
Antimony, Total, GF	(HL/EPA200.9)	mg/l	ND				0.005	27-oct-1994	wlm	27-oct-1994	wlm
Thallium, GF	(HL/EPA 200.9)	mg/l	ND				0.001	25-oct-1994	gub	29-oct-1994	wlm

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/l	1.0	0.989	99
LCS2	Barium, Total, ICAP	mg/l	1.0	1.00	100
MBLK	Barium, Total, ICAP	mg/l	ND	ND	
MS	Barium, Total, ICAP	mg/l	1.0	0.943	94
MSD	Barium, Total, ICAP	mg/l	1.0	0.918	92
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0471	94
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0472	95
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0464	93
MSD	Beryllium, Total, ICAP	mg/l	0.05	0.0449	90
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0101	101
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0102	102
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.01	0.0087	87
MSD	Cadmium, Total, GF	mg/l	0.01	0.0084	84
LCS1	Mercury	ug/l	1.50	1.41	94
LCS2	Mercury	ug/l	1.50	1.38	92
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.48	99
MSD	Mercury	ug/l	1.50	1.49	99
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.496	99
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.493	99
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.462	92
MSD	Nickel, Total, ICAP	mg/l	0.5	0.457	91
LCS1	Antimony, Total, GF	mg/l	0.04	0.0365	91
LCS2	Antimony, Total, GF	mg/l	0.04	0.0362	90
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.0449	112
MSD	Antimony, Total, GF	mg/l	0.040	0.0465	116
LCS1	Thallium, GF	mg/l	0.008	0.0073	97

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS2	Thallium, GF	mg/l	0.008	0.00828	104
MBLK	Thallium, GF	mg/l	ND	ND	
MS	Thallium, GF	mg/l	0.008	0.00823	103
MSD	Thallium, GF	mg/l	0.008	0.00810	101

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Laboratory Report

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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarbs (ML/EPA 531.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
3-Hydroxycarbofuran	ug/l	ND				2			24-oct-1994	llj
Aldicarb (Temik)	ug/l	ND				0.5			24-oct-1994	llj
Aldicarb sulfone	ug/l	ND				0.8			24-oct-1994	llj
Aldicarb sulfoxide	ug/l	ND				0.5			24-oct-1994	llj
Baygon	ug/l	ND				2			24-oct-1994	llj
Carbofuran (Furadan)	ug/l	ND				0.9			24-oct-1994	llj
Carbaryl	ug/l	ND				2			24-oct-1994	llj
Methiocarb	ug/l	ND				2			24-oct-1994	llj
Methomyl	ug/l	ND				2			24-oct-1994	llj
Oxamyl (Vydate)	ug/l	ND				2			24-oct-1994	llj

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Laboratory Report

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Honolulu , HI 96843
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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarbs (ML/EPA 531.1)

Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
BDMC	87	80 - 120

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Laboratory Report

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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	18.9	94
LCS1	Aldicarb (Temik)	ug/l	20.0	18.7	94
LCS1	Aldicarb sulfone	ug/l	20.0	19.0	95
LCS1	Aldicarb sulfoxide	ug/l	20.0	15.4	77
LCS1	Baygon	ug/l	20.0	19.6	98
LCS1	Carbofuran (Furadan)	ug/l	20.0	19.6	98
LCS1	Carbaryl	ug/l	20.0	18.6	93
LCS1	Methiocarb	ug/l	20.0	16.7	84
LCS1	Methomyl	ug/l	20.0	18.5	92
LCS1	Oxamyl (Vydate)	ug/l	20.0	18.0	90
LCS2	3-Hydroxycarbofuran	ug/l	20.0	NA	
LCS2	Aldicarb (Temik)	ug/l	20.0	NA	
LCS2	Aldicarb sulfone	ug/l	20.0	NA	
LCS2	Aldicarb sulfoxide	ug/l	20.0	NA	
LCS2	Baygon	ug/l	20.0	NA	
LCS2	Carbofuran (Furadan)	ug/l	20.0	NA	
LCS2	Carbaryl	ug/l	20.0	NA	
LCS2	Methiocarb	ug/l	20.0	NA	
LCS2	Methomyl	ug/l	20.0	NA	
LCS2	Oxamyl (Vydate)	ug/l	20.0	NA	
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20.0	20.1	100

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Laboratory Report

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Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarb[B] (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (oxime)	ug/l	20.0	19.6	98
MS	Aldicarb sulfone	ug/l	20.0	19.3	96
MS	Aldicarb sulfoxide	ug/l	20.0	19.6	98
MS	Baygon	ug/l	20.0	20.1	100
MS	Carbofuran (Furadan)	ug/l	20.0	19.9	100
MS	Carbaryl	ug/l	20.0	20.3	102
MS	Methiocarb	ug/l	20.0	18.5	92
MS	Methomyl	ug/l	20.0	18.5	92
MS	Oxamyl (Vydate)	ug/l	20.0	18.7	94
MSD	3-Hydroxycarbofuran	ug/l	20.0	20.2	101
MSD	Aldicarb (oxime)	ug/l	20.0	19.5	98
MSD	Aldicarb sulfone	ug/l	20.0	19.5	98
MSD	Aldicarb sulfoxide	ug/l	20.0	19.2	98
MSD	Baygon	ug/l	20.0	20.3	102
MSD	Carbofuran (Furadan)	ug/l	20.0	20.2	101
MSD	Carbaryl	ug/l	20.0	20.4	102
MSD	Methiocarb	ug/l	20.0	20.3	102
MSD	Methomyl	ug/l	20.0	18.6	93
MSD	Oxamyl (Vydate)	ug/l	20.0	18.9	94

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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
2,4,5-TP (Silvex)	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
2,4-D	ug/l	ND				0.1	26-oct-1994	rvd	30-oct-1994	dst
2,4-DB	ug/l	ND				2	26-oct-1994	rvd	30-oct-1994	dst
Dichlorprop	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994	dst
5-Hydroxydicamba	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
Acifluorfen (qualitative)	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
Bentazon	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994	dst
Chloramben (qualitative)	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994	dst
Dalapon (qualitative)	ug/l	ND				1	26-oct-1994	rvd	30-oct-1994	dst
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	26-oct-1994	rvd	30-oct-1994	dst
DCPA	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
Dicamba	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
Dinoseb	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994	dst
Pentachlorophenol	ug/l	ND				0.04	26-oct-1994	rvd	30-oct-1994	dst
Picloram	ug/l	ND				0.1	26-oct-1994	rvd	30-oct-1994	dst
4-Nitrophenol (qualitative)	ug/l	ND				5	26-oct-1994	rvd	30-oct-1994	dst
Data Entry	--	11/03/94				0	26-oct-1994	rvd	30-oct-1994	dst

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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	118	70 - 130

Report #: 16365

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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.52	104
LCS1	2,4-D	ug/l	1.00	1.01	101
LCS1	Bentazon	ug/l	1.00	1.04	104
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Actifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.53	106
MS	2,4-D	ug/l	1.00	1.06	106
MS	Bentazon	ug/l	1.00	1.14	114
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

Report #: 16365

MONTGOMERY LABORATORIES
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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 1016 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1221 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1232 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1242 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1248 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1254 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
PCB 1260 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
Alpha-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Alachlor (Alanex)	ug/l	ND				0.05	24-oct-1994	rvd	30-oct-1994	dst
Aldrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Beta-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Chlordane	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994	dst
Chlorthalonil (Draconil, Bravo)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Delta-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
p,p' DDD	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
p,p' DDE	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
p,p' DDT	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Dieldrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Endrin Aldehyde	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Endrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Endosulfan I (alpha)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Endosulfan II (beta)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Endosulfan sulfate	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Heptachlor	ug/l	NA				0.01	24-oct-1994	rvd	30-oct-1994	dst
Heptachlor Epoxide	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Lindane (gamma-BHC)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994	dst
Methoxychlor	ug/l	ND				0.05	24-oct-1994	rvd	30-oct-1994	dst
Toxaphene	ug/l	ND				0.5	24-oct-1994	rvd	30-oct-1994	dst
Data Entry	-	11/04/94				0	24-oct-1994	rvd	30-oct-1994	dst

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	100	70 - 130

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Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.03	60
LCS1	p,p' DDT	ug/l	0.10	0.09	90
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.10	100
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.03	60
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.04	80
MS	p,p' DDT	ug/l	0.10	0.10	100
MS	Dieldrin	ug/l	0.10	0.11	110
MS	Endrin	ug/l	0.10	0.10	100
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.05	100

Report #: 16365

Report 16365 Comment Page

Group Validation Comments

(508) Heptachlor reported as NA due to QC failure on LCS, use 525.1 results for heptachlor. Reference QIR-GC-94-150.

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#5

Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

MONTGOMERY LABORATORIES
Submitted on
DEC 30 1994
HDS

Report#: 17105

Report Summary of positive results, PR17105

Analyzed	941202078 WAIPAHU WELL III HOLE #5	Result	MDL	UNITS
12/09/94	Data Entry	12/12/94		--
12/09/94	Ethylene Dibromide (EDB)	0.02	.010	UGL
12/12/94	Data Entry	12/15/94		--
12/10/94	Data Entry	12/19/94		--
12/02/94	Data Entry	12/09/94		--

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Barium, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.02			09-dec-1994	jpm
Beryllium, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.001			09-dec-1994	jpm
Cadmium, Total, GF	(HL/EPA206.2)	mg/l	ND				0.001	12-dec-1994	wlm	12-dec-1994	wlm
Mercury	(HL/EPA 245.1)	ug/l	ND				0.2	09-dec-1994	eyw	10-dec-1994	gub
Nickel, Total, ICAP	(HL/6010-200.7)	mg/l	ND			1	0.01			09-dec-1994	jpm
Antimony, Total, GF	(HL/EPA200.9)	mg/l	ND				0.005	10-dec-1994	wlm	10-dec-1994	wlm
Thallium, GF	(HL/EPA 200.9)	mg/l	ND				0.001	09-dec-1994	gub	28-dec-1994	WTM

Report #: 17105

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/l	1.0	0.994	99
LCS2	Barium, Total, ICAP	mg/l	1.0	0.982	98
MBLK	Barium, Total, ICAP	mg/l	ND	ND	
MS	Barium, Total, ICAP	mg/l	1.0	1.01	101
MSD	Barium, Total, ICAP	mg/l	1.0	1.03	103
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0473	95
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0462	92
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0474	95
MSD	Beryllium, Total, ICAP	mg/l	0.05	0.0495	99
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0113	113
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0113	113
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.01	0.0096	96
MSD	Cadmium, Total, GF	mg/l	0.01	0.0104	104
LCS1	Mercury	ug/l	1.50	1.30	87
LCS2	Mercury	ug/l	1.50	1.29	86
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.27	85
MSD	Mercury	ug/l	1.50	1.27	85
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.499	100
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.484	97
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.509	102
MSD	Nickel, Total, ICAP	mg/l	0.5	0.517	103
LCS1	Antimony, Total, GF	mg/l	0.04	0.0457	114
LCS2	Antimony, Total, GF	mg/l	0.04	0.0440	110
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.0440	110
MSD	Antimony, Total, GF	mg/l	0.040	0.0479	120
LCS1	Thallium, GF	mg/l	0.008	0.00983	123

Report #: 17105

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/l	1.0	0.994	99
LCS2	Barium, Total, ICAP	mg/l	1.0	0.982	98
MBLK	Barium, Total, ICAP	mg/l	ND	ND	
MS	Barium, Total, ICAP	mg/l	1.0	1.01	101
MSD	Barium, Total, ICAP	mg/l	1.0	1.03	103
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0473	95
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0462	92
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0474	95
MSD	Beryllium, Total, ICAP	mg/l	0.05	0.0495	99
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0113	113
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0113	113
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.01	0.0096	96
MSD	Cadmium, Total, GF	mg/l	0.01	0.0104	104
LCS1	Mercury	ug/l	1.50	1.30	87
LCS2	Mercury	ug/l	1.50	1.29	86
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.27	85
MSD	Mercury	ug/l	1.50	1.27	85
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.499	100
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.484	97
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.509	102
MSD	Nickel, Total, ICAP	mg/l	0.5	0.517	103
LCS1	Antimony, Total, GF	mg/l	0.04	0.0457	114
LCS2	Antimony, Total, GF	mg/l	0.04	0.0440	110
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.0440	110
MSD	Antimony, Total, GF	mg/l	0.040	0.0479	120
LCS1	Thallium, GF	mg/l	0.008	0.00983	123

Report #: 17105

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS2	Thallium, GF	mg/l	0.008	0.00914	114
MBLK	Thallium, GF	mg/l	ND	ND	
MS	Thallium, GF	mg/l	0.008	0.0106	132
MSD	Thallium, GF	mg/l	0.008	0.0107	134

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ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Dibromochloropropane (DBCP)	ug/l	ND				0.01	08-dec-1994	hth	09-dec-1994	hth
Ethylene Dibromide (EDB)	ug/l	0.02				0.01	08-dec-1994	hth	09-dec-1994	hth
Data Entry	--	12/12/94				0	08-dec-1994	hth	09-dec-1994	hth

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.11	110
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.11	110
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
MS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

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ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
alpha-Chlordane	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Acenaphthylene	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994	crw
Alachlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Aldrin	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Anthracene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Atrazine	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Benz(a)Anthracene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Benzo(a)pyrene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	05-dec-1994	csk	08-dec-1994	crw
Butylbenzylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Bromacil	ug/l	ND				2	05-dec-1994	csk	08-dec-1994	crw
Butachlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Chrysene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	05-dec-1994	csk	08-dec-1994	crw
Diethylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Diazinon	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994	crw
Dieldrin	ug/l	ND				0.2	05-dec-1994	csk	08-dec-1994	crw
Dimethylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Dimethoate	ug/l	ND				10	05-dec-1994	csk	08-dec-1994	crw
Di-n-Butylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Endrin	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994	crw
Fluorene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
gamma-Chlordane	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Hexachlorobenzene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Hexachlorocyclopentadiene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw

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Laboratory Report

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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.04	05-dec-1994	csk	08-dec-1994	crw
Heptachlor Epoxide	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Indeno(1,2,3-cd)Pyrene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Isophorone	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Lindane	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Methoxychlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Metribuzin	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Molinate	ug/l	ND				0.2	05-dec-1994	csk	08-dec-1994	crw
Metolachlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
trans-Nonachlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Pentachlorophenol	ug/l	ND				1	05-dec-1994	csk	08-dec-1994	crw
Phenanthrene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994	crw
Prometryn	ng/l	ND				0.5	05-dec-1994	csk	08-dec-1994	crw
Propachlor	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Pyrene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Simazine	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994	crw
Thiobencarb	ug/l	ND				0.2	05-dec-1994	csk	08-dec-1994	crw
Trifluralin	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994	crw

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	107	70 - 130

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	1.91	96
LCS1	Acenaphthylene	ug/l	2	1.82	91
LCS1	Alachlor	ug/l	2	2.08	104
LCS1	Aldrin	ug/l	2	1.83	92
LCS1	Anthracene	ug/l	2	1.71	86
LCS1	Atrazine	ug/l	2	1.86	93
LCS1	Benz(a)Anthracene	ug/l	2	1.74	87
LCS1	Benzo(a)pyrene	ug/l	2	1.78	89
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.94	97
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.87	94
LCS1	Benzo(k)Fluoranthene	ug/l	2	1.79	90
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	2.00	100
LCS1	Butylbenzylphthalate	ug/l	2	1.74	87
LCS1	Chrysene	ug/l	2	1.81	90
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.78	89
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	1.56	78
LCS1	Diethylphthalate	ug/l	2	1.94	97
LCS1	Dimethylphthalate	ug/l	2	1.89	94
LCS1	Di-n-Butylphthalate	ug/l	2	2.07	104
LCS1	Endrin	ug/l	2	1.95	98
LCS1	Fluorene	ug/l	2	1.87	94
LCS1	gamma-Chlordane	ug/l	2	1.90	95
LCS1	Hexachlorobenzene	ug/l	2	1.68	84
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.18	59
LCS1	Heptachlor	ug/l	2	1.94	97
LCS1	Heptachlor Epoxide	ug/l	2	1.86	93
LCS1	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.81	90
LCS1	Lindane	ug/l	2	1.76	88
LCS1	Methoxychlor	ug/l	2	1.92	96
LCS1	Molinate	ug/l	2	1.90	95
LCS1	trans-Nonachlor	ug/l	2	1.85	92

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	6	6.37	80
LCS1	Phenanthrene	ug/l	2	1.79	90
LCS1	Pyrene	ug/l	2	2.01	100
LCS1	Simazine	ug/l	2	1.90	95
LCS1	Thiobencarb	ug/l	2	1.89	94
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di-(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	mg/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.02	101
MS	Acenaphthylene	ug/l	2	1.78	89
MS	Alachlor	ug/l	2	2.09	104
MS	Aldrin	ug/l	2	1.89	94
MS	Anthracene	ug/l	2	1.77	88
MS	Atrazine	ug/l	2	1.98	99
MS	Benz(a)Anthracene	ug/l	2	1.79	90
MS	Benzo(a)pyrene	ug/l	2	1.87	94
MS	Benzo(b)Fluoranthene	ug/l	2	1.94	97
MS	Benzo(g,h,i)Perylene	ug/l	2	1.90	95

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(k)fluoranthene	ug/l	2	1.86	93
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	2.08	104
MS	Butylbenzylphthalate	ug/l	2	1.78	89
MS	Chrysene	ug/l	2	1.85	92
MS	Dibenz(a,h)Anthracene	ug/l	2	1.86	93
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.70	85
MS	Diethylphthalate	ug/l	2	1.97	98
MS	Dimethylphthalate	ug/l	2	1.91	96
MS	Di-n-Butylphthalate	ug/l	2	2.12	106
MS	Endrin	ug/l	2	2.06	103
MS	Fluorene	ug/l	2	1.92	96
MS	gamma-Chlordane	ug/l	2	1.93	96
MS	Hexachlorobenzene	ug/l	2	1.83	92
MS	Hexachlorocyclopentadiene	ug/l	2	1.30	65
MS	Heptachlor	ug/l	2	1.92	96
MS	Heptachlor Epoxide	ug/l	2	1.93	96
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.82	91
MS	Lindane	ug/l	2	1.87	94
MS	Methoxychlor	ug/l	2	1.99	100
MS	Molinate	ug/l	2	1.87	94
MS	trans-Nonachlor	ug/l	2	1.97	98
MS	Pentachlorophenol	ug/l	8	5.88	74
MS	Phenanthrene	ug/l	2	1.88	94
MS	Pyrene	ug/l	2	2.09	104
MS	Simazine	ug/l	2	1.90	95
MS	Thiobencarb	ug/l	2	1.93	96

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project

Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarbs (ML/EPA 531.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
3-Hydroxycarbofuran	ug/l	ND				2			10-dec-1994	LLJ
Aldicarb (Temik)	ug/l	ND				0.5			10-dec-1994	LLJ
Aldicarb sulfone	ug/l	ND				0.8			10-dec-1994	LLJ
Aldicarb sulfoxide	ug/l	ND				0.5			10-dec-1994	LLJ
Baygon	ug/l	ND				2			10-dec-1994	LLJ
Carbofuran (Furadan)	ug/l	ND				0.9			10-dec-1994	LLJ
Carbaryl	ug/l	ND				2			10-dec-1994	LLJ
Methiocarb	ug/l	ND				2			10-dec-1994	LLJ
Methomyl	ug/l	ND				2			10-dec-1994	LLJ
Oxamyl (Vydate)	ug/l	ND				2			10-dec-1994	LLJ

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarbs (ML/EPA 531.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
BDMC	89	80 - 120

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarbs (ML/EPA 531.1)

Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	18.8	94
LCS1	Aldicarb (Temik)	ug/l	20.0	18.7	94
LCS1	Aldicarb sulfone	ug/l	20.0	18.1	90
LCS1	Aldicarb sulfoxide	ug/l	20.0	17.8	89
LCS1	Baygon	ug/l	20.0	19.0	95
LCS1	Carbofuran (Furadan)	ug/l	20.0	19.0	95
LCS1	Carbaryl	ug/l	20.0	19.3	96
LCS1	Methiocarb	ug/l	20.0	19.3	96
LCS1	Methomyl	ug/l	20.0	18.0	90
LCS1	Oxamyl (Vydate)	ug/l	20.0	18.1	90
LCS2	3-Hydroxycarbofuran	ug/l	20.0	NA	
LCS2	Aldicarb (Temik)	ug/l	20.0	NA	
LCS2	Aldicarb sulfone	ug/l	20.0	NA	
LCS2	Aldicarb sulfoxide	ug/l	20.0	NA	
LCS2	Baygon	ug/l	20.0	NA	
LCS2	Carbofuran (Furadan)	ug/l	20.0	NA	
LCS2	Carbaryl	ug/l	20.0	NA	
LCS2	Methiocarb	ug/l	20.0	NA	
LCS2	Methomyl	ug/l	20.0	NA	
LCS2	Oxamyl (Vydate)	ug/l	20.0	NA	
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20.0	19.0	95

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (Temik)	ug/l	20.0	19.8	99
MS	Aldicarb sulfone	ug/l	20.0	18.5	92
MS	Aldicarb sulfoxide	ug/l	20.0	18.0	90
MS	Baygon	ug/l	20.0	19.3	96
MS	Carbofuran (Furadan)	ug/l	20.0	19.2	96
MS	Carbaryl	ug/l	20.0	19.3	96
MS	Methiocarb	ug/l	20.0	19.9	100
MS	Methomyl	ug/l	20.0	18.5	92
MS	Oxamyl (Vydate)	ug/l	20.0	18.6	93
MSD	3-Hydroxycarbofuran	ug/l	20.0	19.2	96
MSD	Aldicarb (Temik)	ug/l	20.0	19.8	99
MSD	Aldicarb sulfone	ug/l	20.0	18.5	92
MSD	Aldicarb sulfoxide	ug/l	20.0	18.0	90
MSD	Baygon	ug/l	20.0	19.4	97
MSD	Carbofuran (Furadan)	ug/l	20.0	19.3	96
MSD	Carbaryl	ug/l	20.0	19.7	98
MSD	Methiocarb	ug/l	20.0	20.6	103
MSD	Methomyl	ug/l	20.0	18.3	92
MSD	Oxamyl (Vydate)	ug/l	20.0	18.6	93

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project

Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
2,4,5-TP (Silvex)	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
2,4-D	ug/l	ND				0.1	07-dec-1994	wpt	12-dec-1994	dst
2,4-DB	ug/l	ND				2	07-dec-1994	wpt	12-dec-1994	dst
Dichlorprop	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
5-Hydroxydicamba	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Acifluorfen (qualitative)	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Bentazon	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
Chloramben (qualitative)	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
Dalapon (qualitative)	ug/l	ND				1	07-dec-1994	wpt	12-dec-1994	dst
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	07-dec-1994	wpt	12-dec-1994	dst
DCPA	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Dicamba	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Dinoseb	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Pentachlorophenol	ug/l	ND				0.04	07-dec-1994	wpt	12-dec-1994	dst
Picloram	ug/l	ND				0.1	07-dec-1994	wpt	12-dec-1994	dst
4-Nitrophenol (qualitative)	ug/l	ND				5	07-dec-1994	wpt	12-dec-1994	dst
Data Entry	--	12/15/94				0	07-dec-1994	wpt	12-dec-1994	dst

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	89	70 - 130

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ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.49	98
LCS1	2,4-D	ug/l	1.00	0.99	99
LCS1	Bentazon	ug/l	1.00	1.11	111
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.51	102
MS	2,4-D	ug/l	1.00	1.04	104
MS	Bentazon	ug/l	1.00	0.96	96
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 1016 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1221 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1232 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1242 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1248 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1254 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
PCB 1260 Aroclor	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
Alpha-BHC	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Alachlor (Alanex)	ug/l	ND				0.05	05-dec-1994	rod	10-dec-1994	dst
Aldrin	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Beta-BHC	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Chlordane	ug/l	ND				0.1	05-dec-1994	rod	10-dec-1994	dst
Chlorthalonil (Dreonil, Bravo)	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Delta-BHC	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
P,P' DDD	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
P,P' DDE	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
P,P' DDT	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Dieldrin	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Endrin Aldehyde	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Endrin	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Endosulfan I (alpha)	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Endosulfan II (beta)	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Endosulfan sulfate	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Heptachlor	ug/l	NA				0.01	05-dec-1994	rod	10-dec-1994	dst
Heptachlor Epoxide	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Lindane (gamma-BHC)	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Methoxychlor	ug/l	ND				0.01	05-dec-1994	rod	10-dec-1994	dst
Toxaphene	ug/l	ND				0.05	05-dec-1994	rod	10-dec-1994	dst
Data Entry		12/19/94				0.5	05-dec-1994	rod	10-dec-1994	dst

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ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	92	70 - 130

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.03	60
LCS1	P,P' DDT	ug/l	0.10	0.08	80
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.09	90
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.03	60
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	P,P' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	P,P' DDD	ug/l	ND	ND	
MBLK	P,P' DDE	ug/l	ND	ND	
MBLK	P,P' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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Laboratory Report

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Sample # 941202078 Sample ID MAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.02	40
MS	p,p' DDT	ug/l	0.10	0.07	70
MS	Dieldrin	ug/l	0.10	0.08	80
MS	Endrin	ug/l	0.10	0.08	80
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.02	40

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Laboratory Report

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1,2-Tetrachloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,1,1-Trichloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,1,2,2-Tetrachloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,1,2-Trichloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,1-Dichloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,1-Dichloroethylene	ug/l	ND				0.5			02-dec-1994	yom
1,1-Dichloropropene	ug/l	ND				0.5			02-dec-1994	yom
1,2,3-Trichlorobenzene	ug/l	ND				0.5			02-dec-1994	yom
1,2,3-Trichloropropane	ug/l	ND				0.5			02-dec-1994	yom
1,2,4-Trichlorobenzene	ug/l	ND				0.5			02-dec-1994	yom
1,2,4-Trimethylbenzene	ug/l	ND				0.5			02-dec-1994	yom
1,2-Dichloroethane	ug/l	ND				0.5			02-dec-1994	yom
1,2-Dichloropropane	ug/l	ND				0.5			02-dec-1994	yom
1,3,5-Trimethylbenzene	ug/l	ND				0.5			02-dec-1994	yom
1,3-Dichloropropane	ug/l	ND				0.5			02-dec-1994	yom
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			02-dec-1994	yom
2,2-Dichloropropane	ug/l	ND				0.5			02-dec-1994	yom
2-Butanone (MEK)	ug/l	ND				5			02-dec-1994	yom
2-Chloroethylvinylether	ug/l	ND				1			02-dec-1994	yom
o-Chlorotoluene	ug/l	ND				0.5			02-dec-1994	yom
p-Chlorotoluene	ug/l	ND				0.5			02-dec-1994	yom
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			02-dec-1994	yom
Benzene	ug/l	ND				0.5			02-dec-1994	yom
Bromobenzene	ug/l	ND				0.5			02-dec-1994	yom
Bromomethane (Methyl Bromide)	ug/l	ND				0.5			02-dec-1994	yom
cis-1,2-Dichloroethylene	ug/l	ND				0.5			02-dec-1994	yom
Chlorobenzene	ug/l	ND				0.5			02-dec-1994	yom
Carbon Tetrachloride	ug/l	ND				0.5			02-dec-1994	yom
cis-1,3-Dichloropropene	ug/l	ND				0.5			02-dec-1994	yom

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Bromoform	ug/l	ND				0.5			02-dec-1994	yom
Chloroform (Trichloromethane)	ug/l	ND				0.5			02-dec-1994	yom
Bromochloromethane	ug/l	ND				0.5			02-dec-1994	yom
Chloroethane	ug/l	ND				0.5			02-dec-1994	yom
Chloromethane(Methyl Chloride)	ug/l	ND				0.5			02-dec-1994	yom
Chlorodibromomethane	ug/l	ND				0.5			02-dec-1994	yom
Dibromomethane	ug/l	ND				0.5			02-dec-1994	yom
Bromodichloromethane	ug/l	ND				0.5			02-dec-1994	yom
Dichloromethane	ug/l	ND				0.5			02-dec-1994	yom
Ethyl benzene	ug/l	ND				0.5			02-dec-1994	yom
Dichlorodifluoromethane	ug/l	ND				0.5			02-dec-1994	yom
Fluorotrichloromethane(Freon1)	ug/l	ND				0.5			02-dec-1994	yom
Hexachlorobutadiene	ug/l	ND				0.5			02-dec-1994	yom
Isopropylbenzene	ug/l	ND				0.5			02-dec-1994	yom
m-Dichlorobenzene (1,3-DCB)	ug/l	ND				0.5			02-dec-1994	yom
m,p-Xylenes	ug/l	ND				0.5			02-dec-1994	yom
Naphthalene	ug/l	ND				0.5			02-dec-1994	yom
n-Butylbenzene	ug/l	ND				0.5			02-dec-1994	yom
n-Propylbenzene	ug/l	ND				0.5			02-dec-1994	yom
o-Xylene	ug/l	ND				0.5			02-dec-1994	yom
o-Dichlorobenzene (1,2-DCB)	ug/l	ND				0.5			02-dec-1994	yom
Tetrachloroethylene (PCE)	ug/l	ND				0.5			02-dec-1994	yom
p-Isopropyltoluene	ug/l	ND				0.5			02-dec-1994	yom
sec-Butylbenzene	ug/l	ND				0.5			02-dec-1994	yom
Styrene	ug/l	ND				0.5			02-dec-1994	yom
trans-1,2-Dichloroethylene	ug/l	ND				0.5			02-dec-1994	yom
tert-Butylbenzene	ug/l	ND				0.5			02-dec-1994	yom
Trichloroethylene (TCE)	ug/l	ND				0.5			02-dec-1994	yom
Trichlorotrifluoroethane(Freon	ug/l	ND				0.5			02-dec-1994	yom

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
trans-1,3-Dichloropropene	ug/l	ND				0.5			02-dec-1994	yom
Toluene	ug/l	ND				0.5			02-dec-1994	yom
Vinyl chloride (VC)	ug/l	ND				0.5			02-dec-1994	yom
Data Entry	--	12/09/94				0			02-dec-1994	yom

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
4-Bromofluorobenzene	105	80 - 120
Toluene-d8	93	80 - 120
1,2-Dichloroethane-d4	99	80 - 120

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Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1,1-Trichloroethane	ug/l	4	4.28	107
LCS1	1,1,2,2-Tetrachloroethane	ug/l	4	3.93	98
LCS1	1,1,2-Trichloroethane	ug/l	4	4.07	102
LCS1	1,1-Dichloroethane	ug/l	4	4.65	116
LCS1	1,1-Dichloroethylene	ug/l	4	4.29	107
LCS1	1,2,4-Trichlorobenzene	ug/l	4	3.76	94
LCS1	1,2-Dichloroethane	ug/l	4	4.14	104
LCS1	1,2-Dichloropropane	ug/l	4	4.20	105
LCS1	1,3-Dichloropropene	ug/l	8	8.09	101
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.07	102
LCS1	Benzene	ug/l	4	4.29	107
LCS1	cis-1,2-Dichloroethylene	ug/l	4	4.27	107
LCS1	Chlorobenzene	ug/l	4	4.22	106
LCS1	Carbon Tetrachloride	ug/l	4	4.62	116
LCS1	Bromoform	ug/l	4	3.85	96
LCS1	Chloroform (Trichloromethane)	ug/l	4	4.21	105
LCS1	Chlorodibromomethane	ug/l	4	4.08	102
LCS1	Bromodichloromethane	ug/l	4	4.20	105
LCS1	Dichloromethane	ug/l	4	4.52	113
LCS1	Ethyl benzene	ug/l	4	4.36	109
LCS1	fluorotrichloromethane(Freon1)	ug/l	4	4.18	104
LCS1	m,p-Xylenes	ug/l	8	8.99	112
LCS1	o-Xylene	ug/l	4	4.42	110
LCS1	o-Dichlorobenzene (1,2-DCB)	ug/l	4	4.01	100
LCS1	Tetrachloroethylene (PCE)	ug/l	4	4.29	107
LCS1	Styrene	ug/l	4	4.34	108
LCS1	trans-1,2-Dichloroethylene	ug/l	4	4.18	104
LCS1	Trichloroethylene (TCE)	ug/l	4	4.25	106
LCS1	Trichlorotrifluoroethane(Freon	ug/l	4	4.53	113
LCS1	Toluene	ug/l	4	4.30	108
LCS1	Vinyl Chloride (VC)	ug/l	4	3.41	85

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ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	

Report #: 17105

MONTGOMERY LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstemacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane(Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane(Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane(Freon	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

Report #: 17105

Report 17105 Comment Page

Group Validation Comments

(508) Heptachlor reported as NA due to QC failure on LCS recovery; see results reported from 525.1 analysis. Reference QIR-GC-94-171.

APPENDIX D

WELL INFORMATION FOR WELLS #1, #2, #3, #4, AND #5

Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0226.

1. STATE WELL NO. 2400-08 WELL NAME WAIPAHU III #1 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-05:74
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING, AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 7/22/94
   (NOTE: Report must be submitted within 30 days after this date)
8. GROUND ELEVATION (msl) 317.83 ft.
   Top of Drilling Platform (msl) _____ ft.
   Height of Drilling Platform above Ground surface _____ ft.
   Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.
9. DRILLER'S LOG:

Depth (ft.)			Rock Description, Remarks, Dates	Water Level (ft.)
0	to	11	RED VERY SOFT	
11	to	28	BROWN GREY BOULDERS	
28	to	78	BROWN MEDIUM HARD	
78	to	138	BROWN GREY MED HARD	
138	to	153	BLUE ROCK VERY HARD	
153	to	163	BROWN GREY MED HARD	
163	to	290	BLUE GREY VERY HARD	
290	to	312	BLUE GREY LITTLE BROWN	
312	to	338	GREY BROWN MED HARD	299
358	to	369	GREY BROWN LOOSE	299
369	to	443	GREY & BROWN LAYERS	299
443	to	458	GREY & BROWN SOFT	299

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND 458 ft.
11. HOLE SIZE: 22 inch dia. from 0 ft. to 358 ft. below ground
    14 3/4 inch dia. from 358 ft. to 458 ft. below ground
    _____ inch dia. from _____ ft. to _____ ft. below ground
12. CASING INSTALLED:
    15 ½ in. I.D. x .375 in. wall solid section to 358 ft. below ground
    _____ in. I.D. x _____ in. wall perforated section to _____ ft. below ground
    Type of Perforation N/A
13. ANNULUS: Grouted from 0 ft. below ground to 358 ft. below ground
    Gravel packed from _____ ft. below ground to _____ ft. below ground
14. INITIAL WATER LEVEL 299 ft. below ground. Date and time of measurement 7/7/94
15. INITIAL CHLORIDE 34 ppm Date and time of sampling 7/14/94
16. INITIAL TEMPERATURE 70.6 °F Date and time of sampling 7/14/94
17. DATE OF PUMP INSTALLATION _____
18. PUMP INSTALLATION:
    Pump Type, Make, Serial No. _____ Capacity _____ gpm
    Motor type, H.P., Voltage, rpm _____
    Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
    Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
    Pumping Head is _____ ft.
19. PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.

Date 7/14/94
Start water level _____ ft. below R.P.
End water level _____ ft. below R.P.
Depth of well _____ ft. below R.P.

Elapsed Time (hours)			Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
STEP TEST ATTACHED						

Date 7/15/94
Start water level _____ ft. below R.P.
End water level _____ ft. below R.P.
Depth of well _____ ft. below R.P.

Elapsed Time (hours)			Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
LONG TERM ATTACHED						

(If more space is needed, continue on back.)

Remarks: _____
(If more space is needed, continue on back.)

Contractor (print) ROSCOE MOSS HAWAII INC Title FIELD SUPERINTENDENT

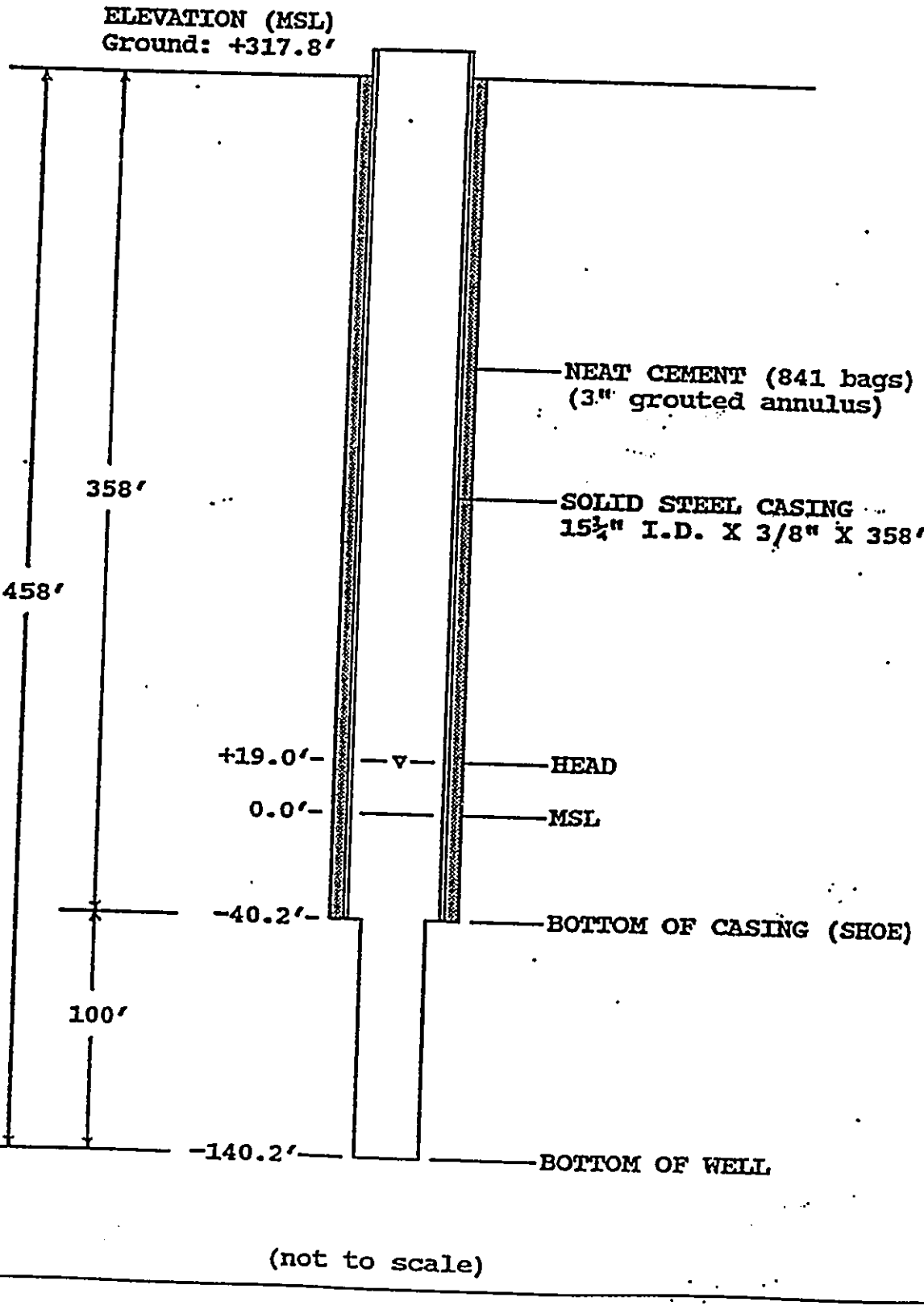
Signature [signature] Date 9/9/94

For Driller's Use: Job Name _____ Job No _____

For Official Use: Well No. _____ Longitude _____ Latitude _____

WAIPAHU WELLS III NO. 2400-09 (WELL #1)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: July 9, 1994
Drilling Contractor: Roscoe Moss, Hawaii, Inc.



WAIPAHU WELLS III NO. 2400-09
Well #1

Plumbness Test: July 11, 1994
Ground Elevation: 317.8± ft. (msl)
Casing Length: 358.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

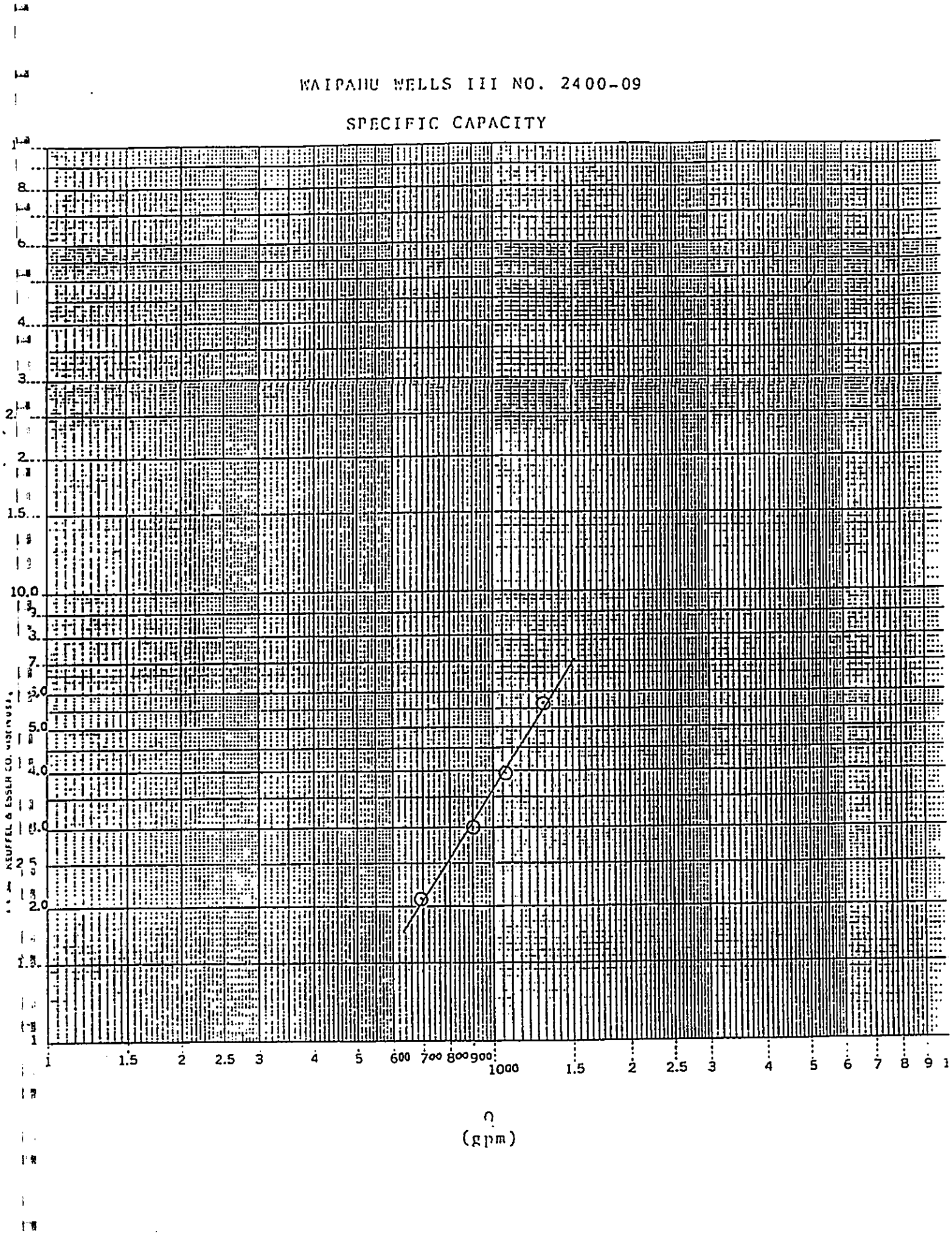
Depth (ft.)	Drift (inches)	Drift (inches per any 100 ft.)
0		
20	1.00	
40	1.66	
60	2.41	
80	3.51	
100	4.54	4.54
120	5.30	4.35
140	6.12	4.55
160	6.99	* 4.67
180	7.43	4.22
200	8.18	3.80
220	8.92	3.83
240	9.66	3.73
260	10.66	3.90
280	10.74	3.55
300	11.45	3.57
320	12.17	3.60
340	12.89	3.60
358	13.53	3.10 (per 98 ft.)

* The maximum drift of 4.67 inches per any 100 feet of depth occurs between 60 feet and 160 feet.

WAIPAHU WELLS III NO. 2400-09
WELL #1

Location	: TMK: 9-4-05:74
Elevation at ground	: +317.8 ft.
Elevation at bottom of well	: -140.2 ft.
Elevation at end of casing	: -40.2 ft.
Diameter of casing	: 15¼ in. I.D.
Head	: +19.0 ft.
Airline Depth	: 340 ft.
Pump Depth (Suction)	: 351 ft.
Drilling completed	: July 1994
Drilling company	: Roscoe Moss Hawaii, Inc.
Date of Yield-Drawdown test	: July 14, 1994

Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature (°F)	Remarks
1115					(17.85 psi static)
1120					started pumping
1140	683	2.54	34	70.8	sample
1150	690	2.08		70.7	
1200	692	2.08	32	70.7	sample
1205					changed rate
1210	890	3.00		70.7	
1220	896	3.00		70.6	
1235	902	3.00		70.7	
1250	906	3.00		70.7	
1300	903	3.00	32	70.7	sample
1305					changed rate
1310	1073	3.92		70.6	
1320	1070	3.92		70.6	
1335	1059	3.92		70.6	
1345	1059	3.92	34	70.7	sample
1350					changed rate
1405	1298	5.66		70.6	
1420	1302	5.66		70.5	
1435	1294	5.66		70.6	
1445	1294	5.66	34	70.6	sample
1450					stopped pumping
1451		4.50			
1453		4.27			
1454		3.69			
1455		3.58			
1457		.11			cleared airline
1458		.00			recovered



WAIPAHU WELLS III NO. 2400-09
WELL #1
LONG TERM PUMPING TEST: 7/15/94 to 7/20/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
7/15/94 (Fri)					
0945					17.70 psi (static)
1000					started pumping
1020	1019	3.24	34	70.7	first sample
1030	1029	3.47		70.7	
1045	1029	3.47		70.7	
1100	1026	3.47		70.7	
1115	1019	3.47		70.7	
1130	1019	3.47		70.7	
1145	1019	3.47		70.7	
1200	1014	3.47		70.6	
1300	1026	3.47		70.6	
1400	1019	3.47		70.6	
1500	1012	3.47		70.7	
1800	1007	3.47		70.7	
2100	1012	3.24		70.7	
2400	1014	3.47		70.7	
7/16/94 (Sat)				70.7	
0300	1014	3.70		70.7	
0600	1012	3.70		70.7	
0900	1019	3.24		70.7	
1000	1026	3.58	34	70.6	average rate:
1200	998	3.58		70.7	1006 gpm
1500	997	3.58		70.7	
1800	998	3.14		70.7	
2100	1000	3.14		70.7	
2400	1000	3.14		70.7	
7/17/94 (Sun)					
0300	1000	3.14		70.7	
0600	1000	3.14		70.7	
0900	1000	3.03		70.7	
1000	995	3.70	34	70.6	average 2 day
1200	984	4.05		70.7	rate: 998 gpm
1500	984	4.05		70.7	
1800	984	2.66		70.7	
2100	984	2.66		70.7	
2400	984	2.66		70.7	
7/18/94 (Mon)					
0300	968	2.66		70.7	
0600	952	2.66		70.7	
0900	984	2.89		70.7	
1000	979	2.77	34	70.6	average 3 day
1200	978	3.01		70.7	rate: 986 gpm
1500	979	3.01		70.7	
1800	999	3.01		70.7	
2100	1013	3.01		70.7	
2400	1014	3.01		70.7	
7/19/94 (Tue)					
0300	1009	3.01		70.7	
0600	1014	3.12		70.7	
0900	1004	3.01		70.7	
1000	995	3.01	34	70.6	average 4 day
1200	1000	2.89		70.7	rate:989 gpm
1500	986	2.89		70.7	
1800	1003	3.12		70.7	
2100	1006	3.01		70.7	
2400	1008	3.12		70.7	
7/20/94 (Wed)					
0300	1010	3.12		70.7	
0600	1022	3.24		70.7	
0955	995	3.01	34	70.6	
1000					stopped pumping
1001		2.54			average 5 day
1002		2.54			rate: 992 gpm
1003		1.16			
1004		.70			
1005		.12			
1006		.00			full recovery

Total pumpage (120 hours): 7,143,900 gallons
Average pumpage per day: 1,428,780 gallons per day
Average pumpage rate: 992 gallons per minute

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0225.

1. STATE WELL NO. 2400-10 WELL NAME WAIPAHU III #2 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-05:74
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 8/26/94
(NOTE: Report must be submitted within 30 days after this date)

RECEIVED
'94 OCT 20 A8:20
BWS

8. GROUND ELEVATION (msl) 316.88 ft.
Top of Drilling Platform (msl) _____ ft.
Height of Drilling Platform above Ground surface _____ ft.
Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)
0 to 23	RED SOFT DIRT	
23 to 63	BROWN GREY MED HARD	
63 to 70	RED BROWN MED SOFT	
70 to 146	BROWN GREY MED HARD	
146 to 163	BLUE GREY VERY HARD	
163 to 180	BROWN GREY MED HARD	
180 to 189	RED MEDIUM SOFT	
189 to 220	BLUE GREY VERY HARD	
220 to 234	RED BROWN MEDIUM SOFT	
234 to 348	BROWN GREY MED HARD	298
348 to 381	BLUE GREY MED HARD	298
381 to 442	GREY BROWN MED HARD	298
442 to 457	BROWN BLUE MED SOFT	

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND 457 ft.
11. HOLE SIZE: 22 inch dia. from 0 ft. to 357 ft. below ground
14.5 inch dia. from 357 ft. to 457 ft. below ground
_____ inch dia. from _____ ft. to _____ ft. below ground
12. CASING INSTALLED:
15.25 In. I.D. x .375 In. wall solid section to 357 ft. below ground
N/A In. I.D. x _____ In. wall perforated section to _____ ft. below ground
Type of Perforation N/A
13. ANNULUS: Grouted from 0 ft. below ground to 357 ft. below ground
Gravel packed from N/A ft. below ground to N/A ft. below ground
14. INITIAL WATER LEVEL 298 ft. below ground. Date and time of measurement 07/28/94
15. INITIAL CHLORIDE 34 ppm Date and time of sampling 08/17/94
16. INITIAL TEMPERATURE 70.6° °F Date and time of sampling 08/17/94
17. DATE OF PUMP INSTALLATION _____
18. PUMP INSTALLATION:
Pump Type, Make, Serial No. _____ Capacity _____ gpm
Motor type, H.P., Voltage, rpm _____
Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
Pumping Head is _____ ft.
19. PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.

Date 08/17/94
Start water level _____ ft. below R.P.
End water level _____ ft. below R.P.
Depth of well _____ ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Drawdown (ft.)	Cl- (ppm)	Temp. °F
BWS DATA ATTACHED				

Date 08/24/94
Start water level _____ ft. below R.P.
End water level _____ ft. below R.P.
Depth of well _____ ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Drawdown (ft.)	Cl- (ppm)	Temp. °F
BWS DATA ATTACHED				

(If more space is needed, continue on back.)

Remarks: _____
(If more space is needed, continue on back.)

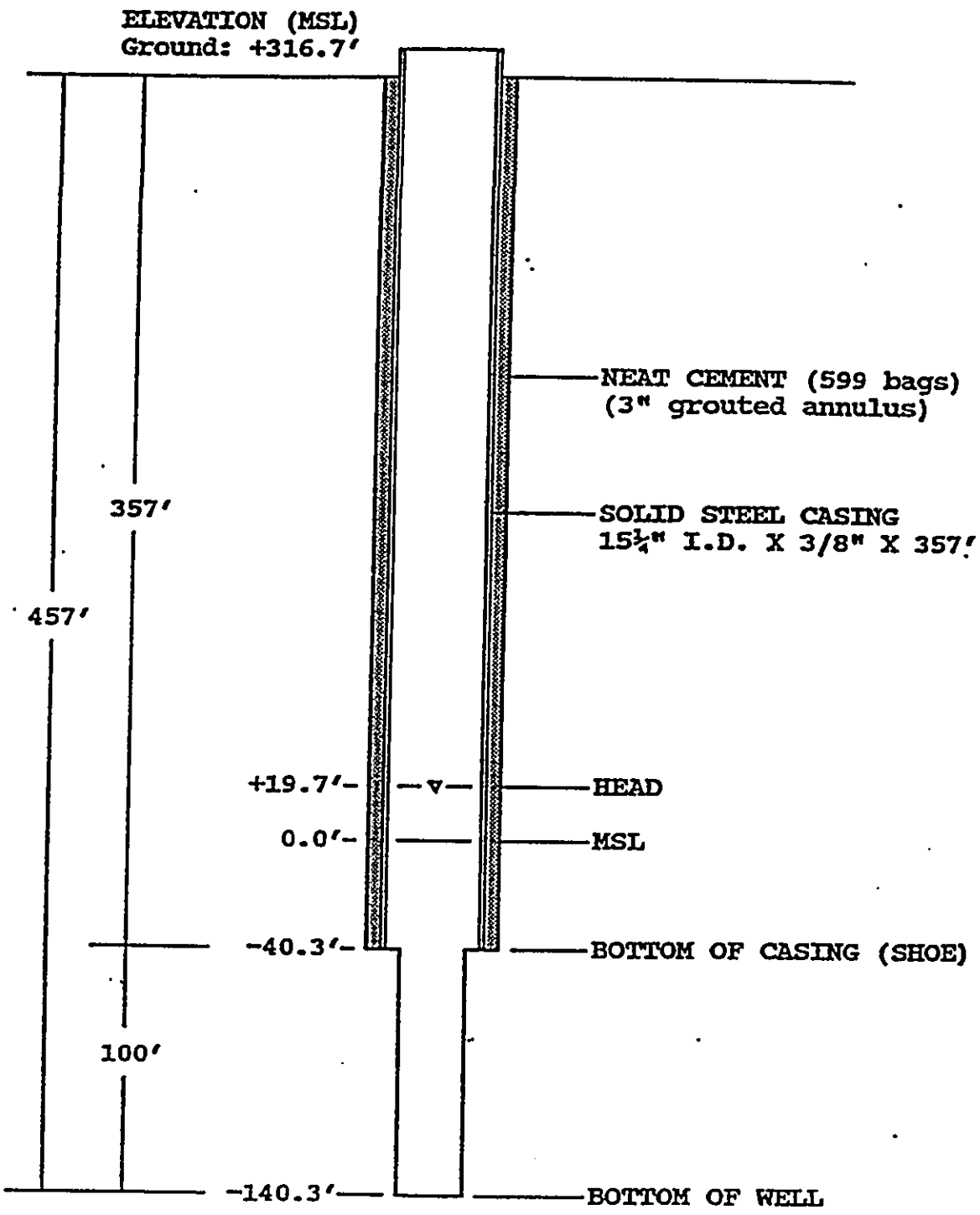
Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
Signature _____ Date 10/18/94

For Driller's Use:
Job Name _____ Job No _____

For Official Use: Well No. 2400-10
Longitude 158 00 13 Latitude 21 24 55

WAIPAHU WELLS III NO. 2400-10 (WELL #2)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: August 8,1994
Drilling Contractor: Roscoe Moss, Hawaii, Inc.



September 1994

(not to scale)

WAIPAHU WELLS III NO. 2400-10
Well #2

Plumbness Test: August 9, 1994
Ground Elevation: 316.7± ft. (msl)
Casing Length: 357.0 ft.
Casing Diameter: 15¾ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

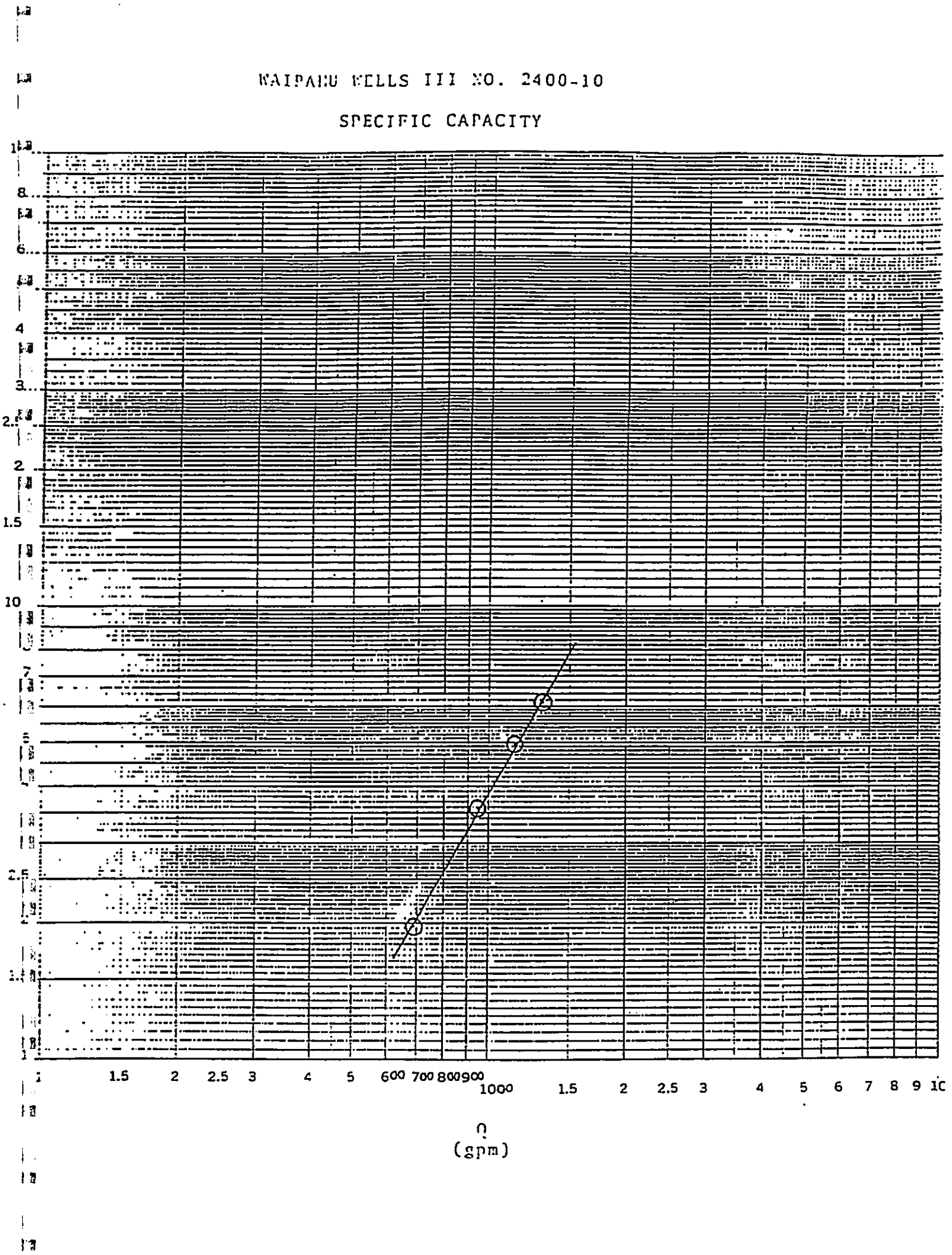
Depth (ft.)	Drift (inches)	Drift (inches per any 100 ft.)
0		
20	.42	
40	1.38	
60	2.00	
80	2.50	3.42
100	3.42	3.58
120	3.99	3.17
140	4.56	2.68
160	4.63	2.58
180	4.92	3.50
200	6.07	5.17
220	7.22	4.73
240	7.80	* 6.35
260	9.21	4.52
280	8.28	2.37
300	8.04	1.43
320	8.54	1.24
340	9.00	
357	9.42	1.41 (per 97 ft.)

* The maximum drift of 6.35 inches per any 100 feet of depth occurs between 160 feet and 260 feet.

WAIPAHU WELLS III NO. 2400-10
WELL #2

Location	: TMK: 9-4-05:74
Elevation at ground	: +316.7 ft.
Elevation at bottom of well	: -140.3 ft.
Elevation at end of casing	: -40.3 ft.
Diameter of casing	: 15¼ in. I.D.
Head	: +19.7 ft.
Airline Depth	: 340 ft.
Pump Depth (Suction)	: 354 ft.
Drilling completed	: August 1994
Drilling company	: Roscoe Moss Hawaii, Inc.
Date of Yield-Drawdown test	: August 17, 1994

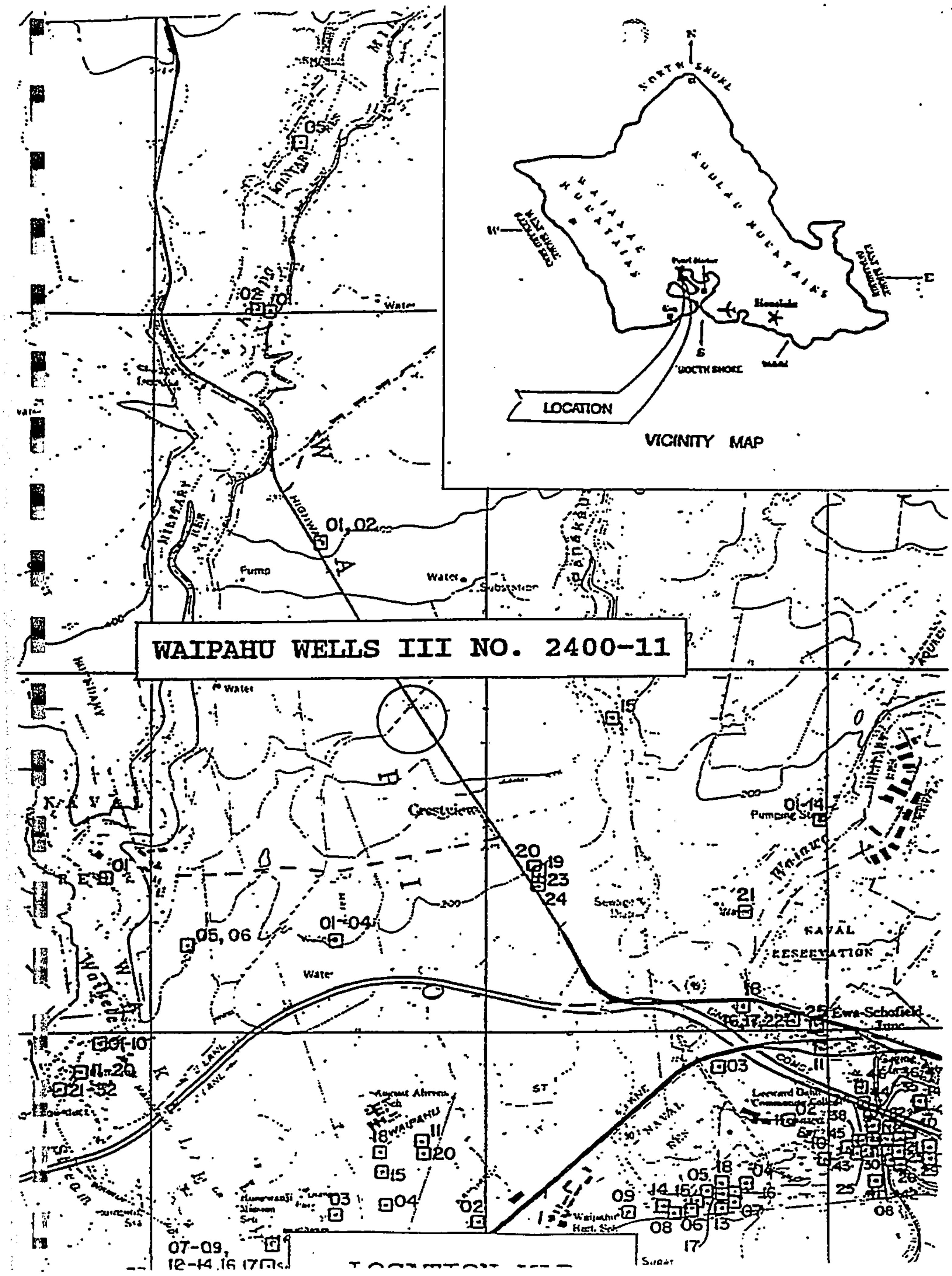
Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature (°F)	Remarks
0845					(18.10 psi static)
0850					started pumping
0900	695	1.96			
0910	683	1.96			
0930	700	1.96			
0945	690	1.96	34	70.6	sample #1
0950					changed rate
0955	956	3.58			
1010	956	3.58			
1025	956	3.58			
1045	951	3.58	34	70.6	sample #2
1050					changed rate
1055	1148	4.97			
1110	1150	4.97			
1125	1148	4.97			
1145	1148	4.97	34	70.6	sample #3
1150					changed rate
1155	1327	6.12			
1210	1309	6.12			
1225	1322	6.12			
1245	1313	6.12	34	70.6	sample #4
1250					stopped pumping
1255		.35			
1300		.11			
1305		.11			



WAIPAHU WELLS III NO. 2400-10
WELL #2
LONG TERM PUMPING TEST: 8/22/94 to 8/25/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
8/22/94 (Mon)					
0945					18.10 psi (static)
1000					started pumping
1010	1014	3.35	34	70.7	sample
1020	1017	3.35			
1030	1033	3.46			
1040	1033	3.46			
1050	1034	3.46			
1100	1034	3.46			
1110	1031	3.46			
1120	1029	3.35			
1130	1020	3.35			
1140	1014	3.23			
1150	1014	3.23			
1200	1014	3.23			
1300	1008	3.12			
1400	1002	3.23			
1500	1000	3.23			
1800	1000	3.35			
1830	1000	3.35			
2100	1000	3.23			
2400	1000	3.23			
8/23/94 (Tue)					
0100	1000	3.35			
0300	1000	3.23			
0600	1000	3.35			
0800	1000	3.35			
0900	1000	3.35			average rate: 1012 gpm
1000	1007	3.23	34	70.6	sample
1005					
1100	1005	3.23			
1200	1000	3.35			
1300	1000	3.23			
1400	1000	3.23			
1500	1000	3.23			
1800	1000	3.23			
2100	1000	3.23			
2400	1000	3.23			
8/24/94 (Wed)					
0300	1000	3.23			
0600	1000	3.23			
0800	1000	3.46			average 2 day rate: 1005 gpm
0900	1000	3.46			
1000	1012	3.35	34	70.6	sample
1200	1000	3.35			
1500	1000	3.35			
1800	1000	3.35			
2100	1000	3.35			
2400	1000	3.35			
8/25/94 (Thur)					
0300	1000	3.35			
0600	1000	3.35			average 3 day rate: 1000 gpm
0900	1000	3.35			
0950	988	3.23	34	70.6	sample
1000					stopped pumping
1001		2.42			
1003		2.31			
1004		2.08			
1005		1.96			
1006		1.85			
1007		1.73			
1008		1.62			
1009		1.50			
1010		1.38			
1011		1.15			
1012		1.04			
1013		.92			
1015		.11			clear airline

Total pumpage (72 hours): 4,319,300 gallons
Average pumpage per day: 1,439,767 gallons
Average pumpage rate: 1,000 gallons per minute


WAIPAHU WELLS III NO. 2400-11
VICINITY MAP
LOCATION
NORTH SHORE
SOUTH SHORE
N
S
E
Crestview
Pump
Water
Substation
NAVAL
RESERVATION
Ewa-Schofield
WAIPAHU
Leeward Oahu
Community College
07-09,
01, 02
01-04
05, 06
01-14
01-10
11-20
21-32

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0225.

1. STATE WELL NO. 2400-11 WELL NAME WAIPAHU WELLS III #3 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-05:74
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING 150 AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 09/23/94
(NOTE: Report must be submitted within 30 days after this date)

8. GROUND ELEVATION (msl) 311.1 ft.
Top of Drilling Platform (msl) 313.1 ft.
Height of Drilling Platform above Ground surface 2 ft.
Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)	Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)
0 to 31	RED BROWN SOFT		251 to 288	GREY BROWN VERY HARD	
31 to 147	BROWN GREY MED HARD		288 to 314	BROWN GREY MED HARD	293
147 to 164	BLUE GREY HARD		314 to 400	BLUE GREY LITTLE BROWN	293
164 to 201	GREY MED HARD		400 to 455	Blue Grey Little Brown	293
201 to 227	BLUE GREY HARD TO MED	HARD	to		
227 to 251	GREY BROWN HARD LOOSE		to		

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND ft.
11. HOLE SIZE:
22 inch dia. from 0 ft. to 355 ft. below ground
13 inch dia. from 355 ft. to 455 ft. below ground
inch dia. from ft. to ft. below ground
12. CASING INSTALLED:
15 ¼ in. I.D. x .375 in. wall solid section to 55 ft. below ground
in. I.D. x in. wall perforated section to ft. below ground
Type of Perforation N/A
13. ANNULUS:
Grouted from 0 ft. below ground to 355 ft. below ground
Gravel packed from N/A ft. below ground to N/A ft. below ground
14. INITIAL WATER LEVEL 293.1 ft. below ground. Date and time of measurement 09/23/94
15. INITIAL CHLORIDE 30 ppm Date and time of sampling 09/23/94
16. INITIAL TEMPERATURE 70.5 °F Date and time of sampling 09/23/94
17. DATE OF PUMP INSTALLATION
18. PUMP INSTALLATION:
Pump Type, Make, Serial No. Capacity gpm
Motor type, H.P., Voltage, rpm
Depth of Pump Intake Setting ft. below , which elevation is ft.
Depth of bottom of airline ft. below , which elevation is ft.
Pumping Head is ft.
19. PUMPING TESTS: Reference Point (R.P.) used: , which elevation is ft.

Date 9/30/94
Start water level 293.1 ft. below R.P.
End water level 293.1 ft. below R.P.
Depth of well 455 ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
to				
to				
to	DATA ATTACHED			
to				
to				

Date 10/17/94
Start water level 293.1 ft. below R.P.
End water level 293.1 ft. below R.P.
Depth of well 455 ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
to				
to				
to	DATA ATTACHED			
to				
to				

(If more space is needed, continue on back.)

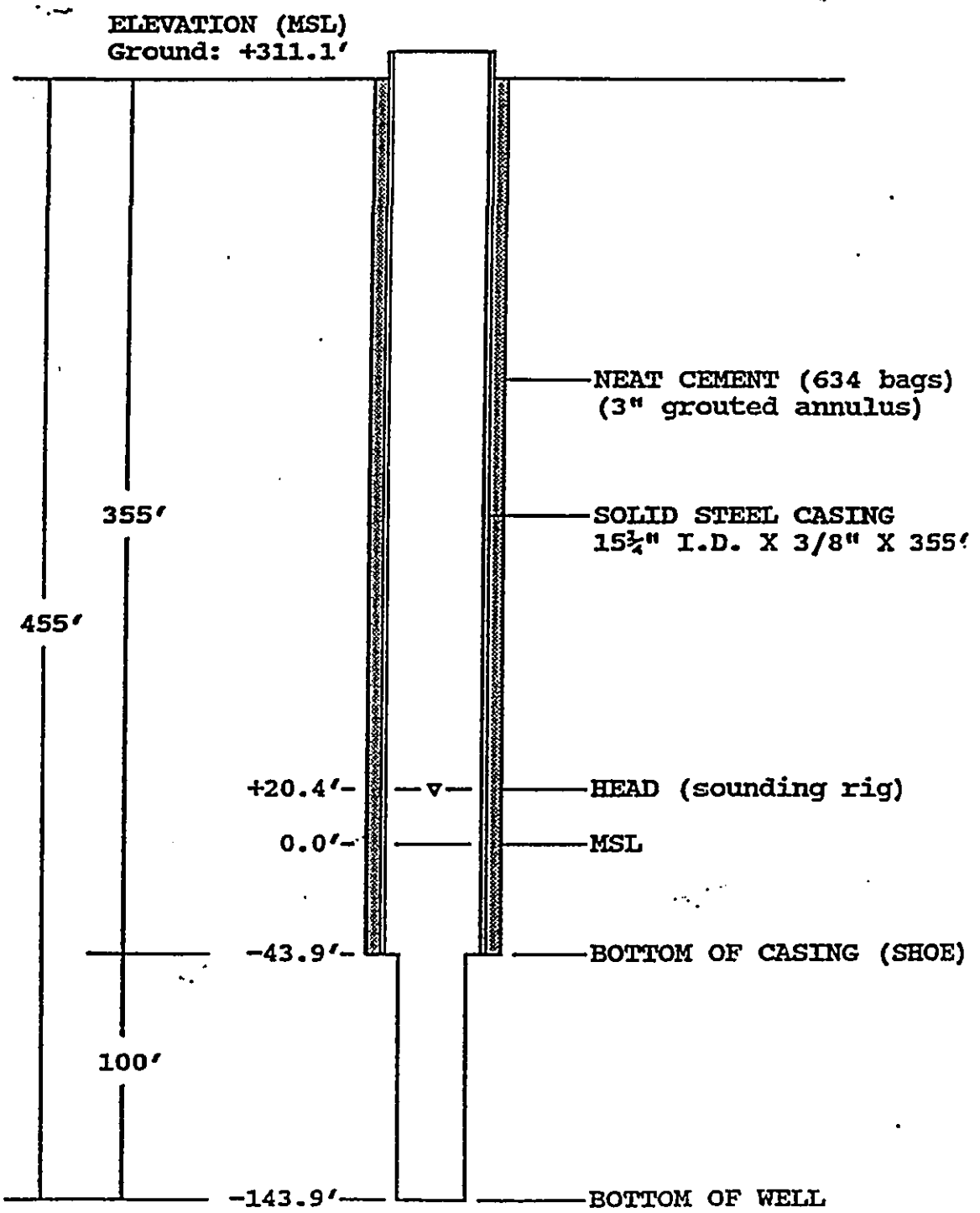
Remarks:
(If more space is needed, continue on back.)

Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
Signature Tracy Powell Date 11/22/94

For Driller's Use: Job Name Job No
For Official Use: Well No. Longitude Latitude

WAIPAHU WELLS III NO. 2400-11 (WELL #3)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: September 23, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



October 1994

(not to scale)

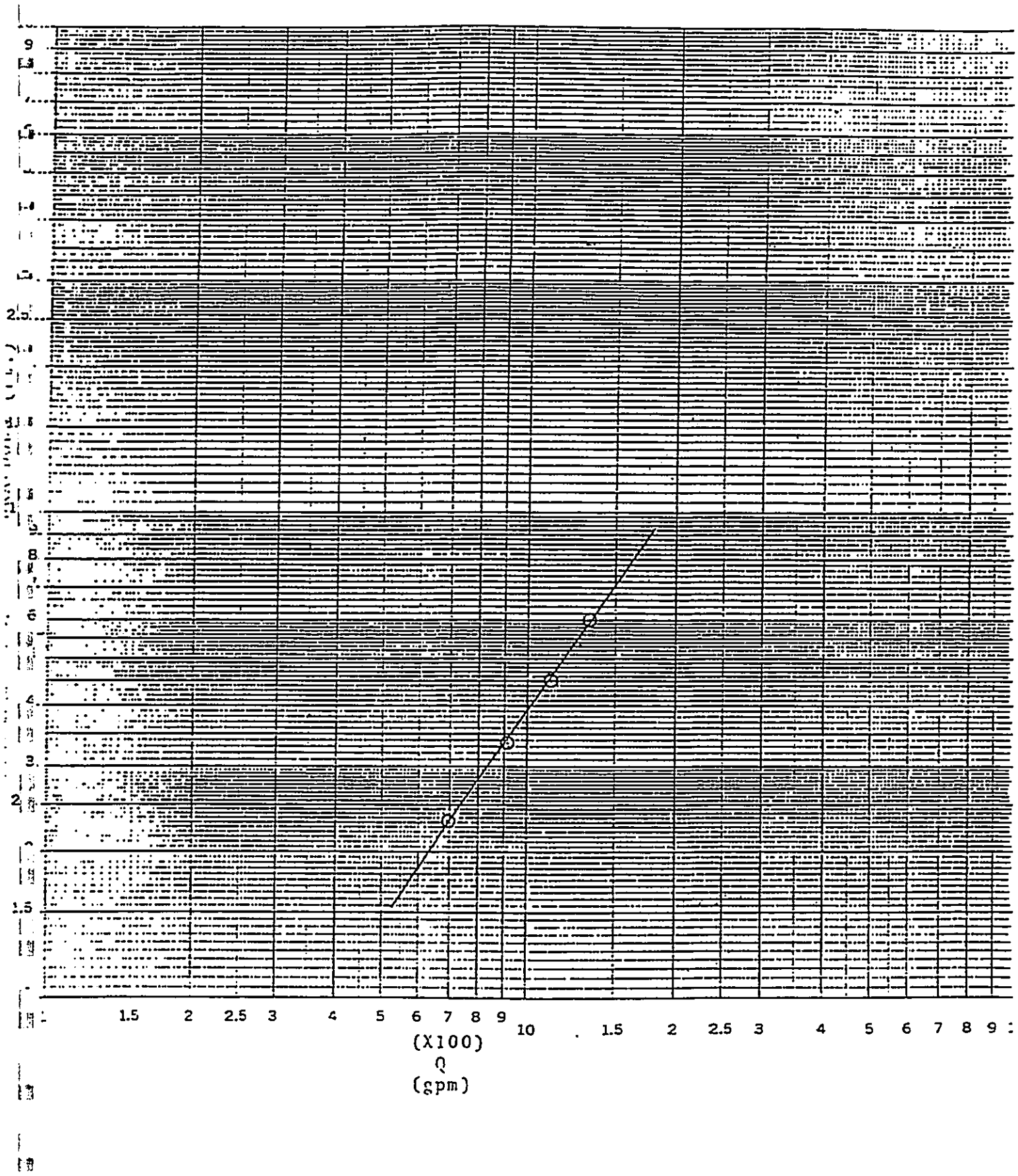
WAIPAHU WELLS III NO. 2400-11
WELL #3

Location	: TMK: 9-4-05:74
Elevation at ground	: +311.1 ft.
Elevation at bottom of well	: -143.9 ft.
Elevation at end of casing	: -43.9 ft.
Diameter of casing	: 15¼ in. I.D.
Head	: +18.0 ft.
Airline Depth	: 340 ft.
Pump Depth (Suction)	: 352 ft.
Drilling completed	: September 23, 1994
Drilling company	: Roscoe Moss Hawaii, Inc.
Date of Yield-Drawdown test	: September 30, 1994

Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature (°F)	Remarks
0855					17.97' static head (airline)
0905					started pumping
0910	715	2.31	30	70.5	sample #1
0920	692	2.31		70.5	
0935	705	2.31		70.4	
0950	697	2.31		70.4	
1000		2.54			
1005	692	2.42		70.4	
1020	691	2.31		70.4	
1030	692	2.31	30	70.4	sample #2
1035					changed rate
1050	922	3.46		70.3	
1105	917	3.46		70.3	
1120	906	3.35		70.3	
1130	912	3.35	30	70.3	sample #3
1135					changed rate
1140	1113	4.50		70.2	
1155	1101	4.50		70.2	
1215	1105	4.50		70.2	
1230	1105	4.50	30	70.2	sample #4
1235					changed rate
1240	1285	6.00		70.2	
1255	1330	6.00		70.3	
1320	1319	6.00		70.2	
1340	1325	6.00		70.3	
1345	1325	6.00		70.3	sample #5
1350					stopped pumping
1351		1.50			
1352					well recovered

WAIPAHU WELLS III NO. 2400-11

WELL #3
SPECIFIC CAPACITY



WAIPAHU WELLS III NO. 2400-11
Well #3

Plumbness Test: September 26, 1994
Ground Elevation: 311.1± ft. (msl)
Casing Length: 355.0 ft.
Casing Diameter: 15¾ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

Depth (ft.)	Drift (inches)	Drift (inches per any 100 ft.)
0		
20	.30	
40	1.28	
60	2.13	
80	3.01	
100	3.61	3.61
120	4.21	4.02
140	5.66	* 4.53
160	5.42	3.53
180	6.40	3.40
200	7.17	3.64
220	8.34	4.28
240	8.14	3.14
260	8.77	3.68
280	8.75	2.58
300	8.94	2.00
320	8.37	.98
340	8.49	1.10
350	8.27	1.10 (per 90 ft.)

* A maximum drift of 4.53 inches per 100 feet of casing occurs between 40 feet and 140 feet.

WAIPAHU WELLS III NO. 2400-11
WELL #3
LONG TERM PUMPING TEST: 10/17/94 to 10/20/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
10/17/94 (Monday)					
0955					18.20' static head
1000					started pumping
1011	1043	3.69	30	70.2	sample #1
1025	1073	3.81		70.3	
1045	1043	3.58		70.3	
1100	1045	3.58		70.3	
1120	1042	3.58		70.2	
1145	1042	3.58		70.2	
1200	1034	3.58			
1500	1026	3.58			
1800	997	3.58			
2100	990	3.35			
2400	991	3.35			
10/18/94 (Tuesday)					
0300	989	3.35			
0600	989	3.92			
0900	982	3.81			
1000	985	3.46	32		sample #2
1200	982	3.81			average rate:
1500	979	3.81			1001 gpm
1800	997	3.46			
2100	995	3.46			
2400	993	3.46			
10/19/94 (Wednesday)					
0300	990	3.46			
0600	986	3.46			
0900	986	3.58			
1000	1054	3.69	32		sample #3
1200	1020	3.69			average 2 day
1500	1020	3.69			rate: 995 gpm
1800	1031	3.92			
2100	1026	3.81			
2400	1045	3.81			
10/20/94 (Thursday)					
0300	1025	3.81			
0600	1032	3.81			
0900	1040	3.69			
0930	1043	3.58		70.3	
0950	1045	3.58	32	70.3	sample #4
1000					stopped pumping

Total pumpage (72 hours): 4,366,000 gallons
Average pumpage per day: 1,455,333 gallons
Average pumpage rate: 1,011 gallons per minute

Honolulu Board of Water Supply

to ENGINEERING BRANCH

from PLANNING BRANCH

subject WAIPAHU WELLS III NO. 2400-13 (WELL #4)

date FEB. 2, 1995

FEB 3 3 29 PM '95

Enclosed are results of the Waipahu Wells III No. 2400-13 (well #4) plumbness test which was performed on November 7, 1994. A maximum drift of 6.92 inches per any 100 ft. of casing occurs between 0 ft. and 100 ft. The maximum allowable drift per any 100 ft. of casing for this well is 10.17 inches. This well meets our plumbness specifications.

Other attachments include the data obtained during construction and subsequent pumping test. The yield-drawdown test was conducted at rates of 700, 900, 1100, and 1300 gpm which produced corresponding drawdowns of 2.08, 3.00, 3.46, and 4.27 ft., respectively.

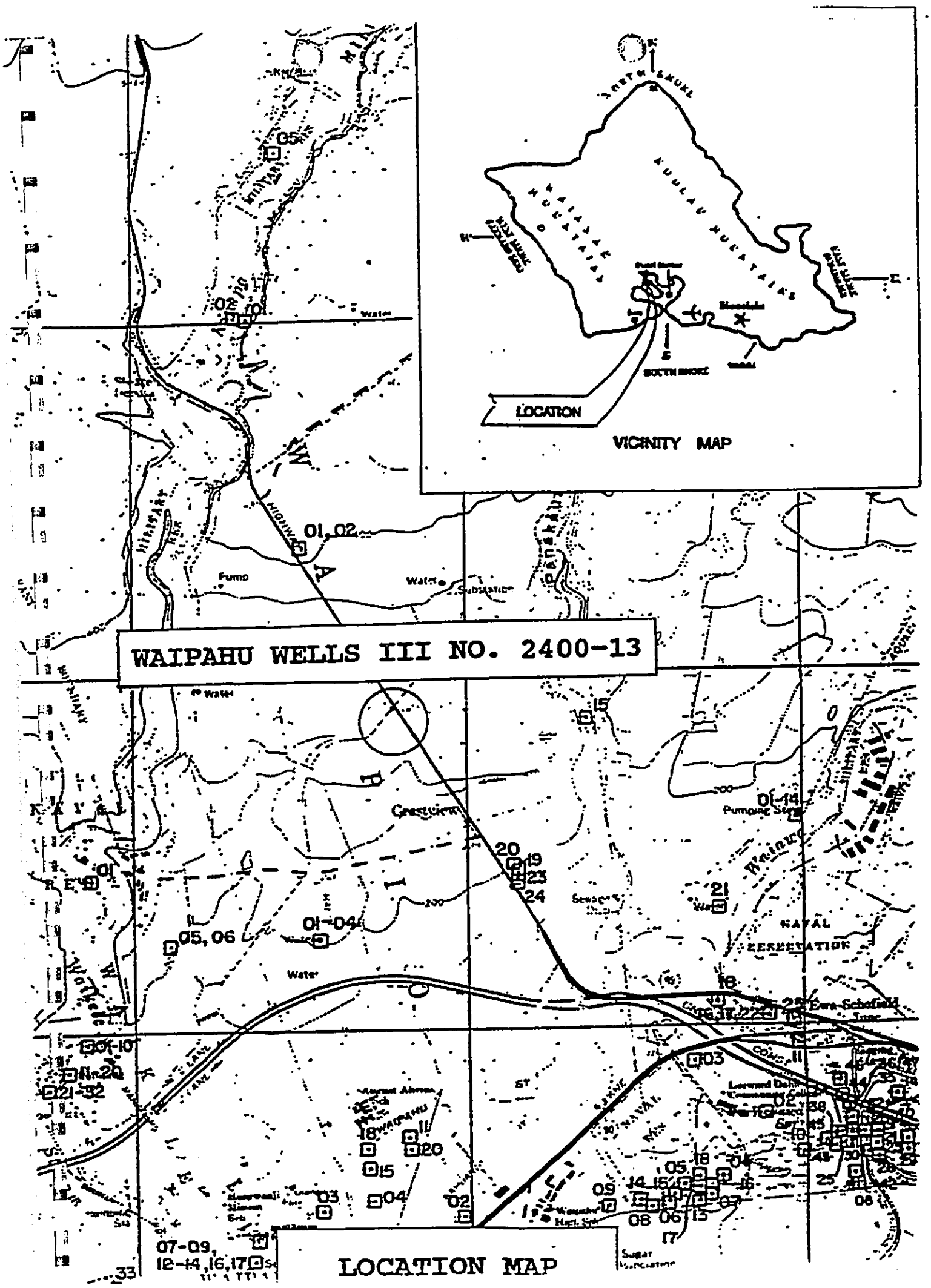
Pumpage rate in the long term test averaged 1003 gpm producing an eventual drawdown of 5.08 ft. The increasing trend of drawdown over the course of the test may have resulted from problems attendant in the use of a weighted small diameter plastic airline. Although drawdown in both tests were characteristic of previous wells, recovery was abbreviated and cropped. A drawdown of 3.46 ft., achieved prior to the onset of airline deviation in the sustained test, approximates the 3.15 ft. at 1,000 gpm obtained from the step test. This value would be more representative of the achievable result of pumpage at the proposed rate.

Test pumping shows that well #4, with the exception of well #5, is more efficient than the other wells. Recovery abnormalities are not believed to be associated with aquifer properties but are probably mechanical in nature. Well #4 can be expected to meet the proposed pump capacity of 1,000 gpm.

Attachment

GHO:rk

cc: Plant Operations
H. Minakami
Engineering (A. Okada)
C. Lao


WAIPAHU WELLS III NO. 2400-13
LOCATION
VICINITY MAP
LOCATION MAP
NORTH SHORE
SOUTH SHORE
WAIANAE MOUNTAINS
KOOLAU MOUNTAINS
HIGHWAY H-1
HIGHWAY 99
WAIPAHU
Pump
Water
Substation
Golf Course
NAVAL RECREATION
Ewa-Schofield Junc
Sugar Plantation

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0225.

1. STATE WELL NO. 2400-13 WELL NAME WAIPAHU III #4 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS WAIPIO GENTRY Tax Map Key 9-4-05:74
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING 150 AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 01/20/95
(NOTE: Report must be submitted within 30 days after this date)

8. GROUND ELEVATION (msl) 313.0 ft.
Top of Drilling Platform (msl) 315.0 ft.
Height of Drilling Platform above Ground surface 2 ft.
Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)			Rock Description, Remarks, Dates	Water Level (ft.)
0	to	19	RED BROWN MED SOFT	
19	to	141	GREY LITTLE BROWN HARD	
141	to	181	GREY VERY HARD	
181	to	319	GREY BLUE VERY HARD	297
319	to	333	GREY BORWN MED HARD	297
333	to	362	GREY BLUE MED HARD	297
362	to	375	grey red brown	297
375	to	392	BLUE GREY MED HARD	297
392	to	453	GREY BROWN MED HARD	297

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND ____ ft.
11. HOLE SIZE: 22 inch dia. from 0 ft. to 353 ft. below ground
14 1/2 inch dia. from 353 ft. to 453 ft. below ground
____ inch dia. from ____ ft. to ____ ft. below ground
12. CASING INSTALLED:
15.25 In. I.D. x .375 in. wall solid section to 353 ft. below ground
NA In. I.D. x ____ in. wall perforated section to ____ ft. below ground
Type of Perforation NA
13. ANNULUS: Grouted from 0 ft. below ground to 353 ft. below ground
Gravel packed from NA ft. below ground to ____ ft. below ground
14. INITIAL WATER LEVEL 297 ft. below ground. Date and time of measurement 10/27/94
15. INITIAL CHLORIDE 36 ppm Date and time of sampling 1/5/95
16. INITIAL TEMPERATURE 71.2° °F Date and time of sampling 1/5/95
17. DATE OF PUMP INSTALLATION ____
18. PUMP INSTALLATION:
Pump Type, Make, Serial No. ____ Capacity ____ gpm
Motor type, H.P., Voltage, rpm ____
Depth of Pump Intake Setting ____ ft. below ____, which elevation is ____ ft.
Depth of bottom of airline ____ ft. below ____, which elevation is ____ ft.
Pumping Head is ____ ft.
19. PUMPING TESTS: Reference Point (R.P.) used: ____, which elevation is ____ ft.

Date 1/5/95
Start water level 297 ft. below R.P.
End water level 297 ft. below R.P.
Depth of well 453 ft. below R.P.

Elapsed Time (hours)			Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
	to					
	to					
	to					
	to		STEP TEST DATA ATTACHED			
	to					
	to					

Date 1/10/95
Start water level 297 ft. below R.P.
End water level 297 ft. below R.P.
Depth of well 453 ft. below R.P.

Elapsed Time (hours)			Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
	to					
	to					
	to					
	to		LONG TERN DATA ATTACHED			
	to					
	to					

(If more space is needed, continue on back.)

Remarks: ____
(If more space is needed, continue on back.)

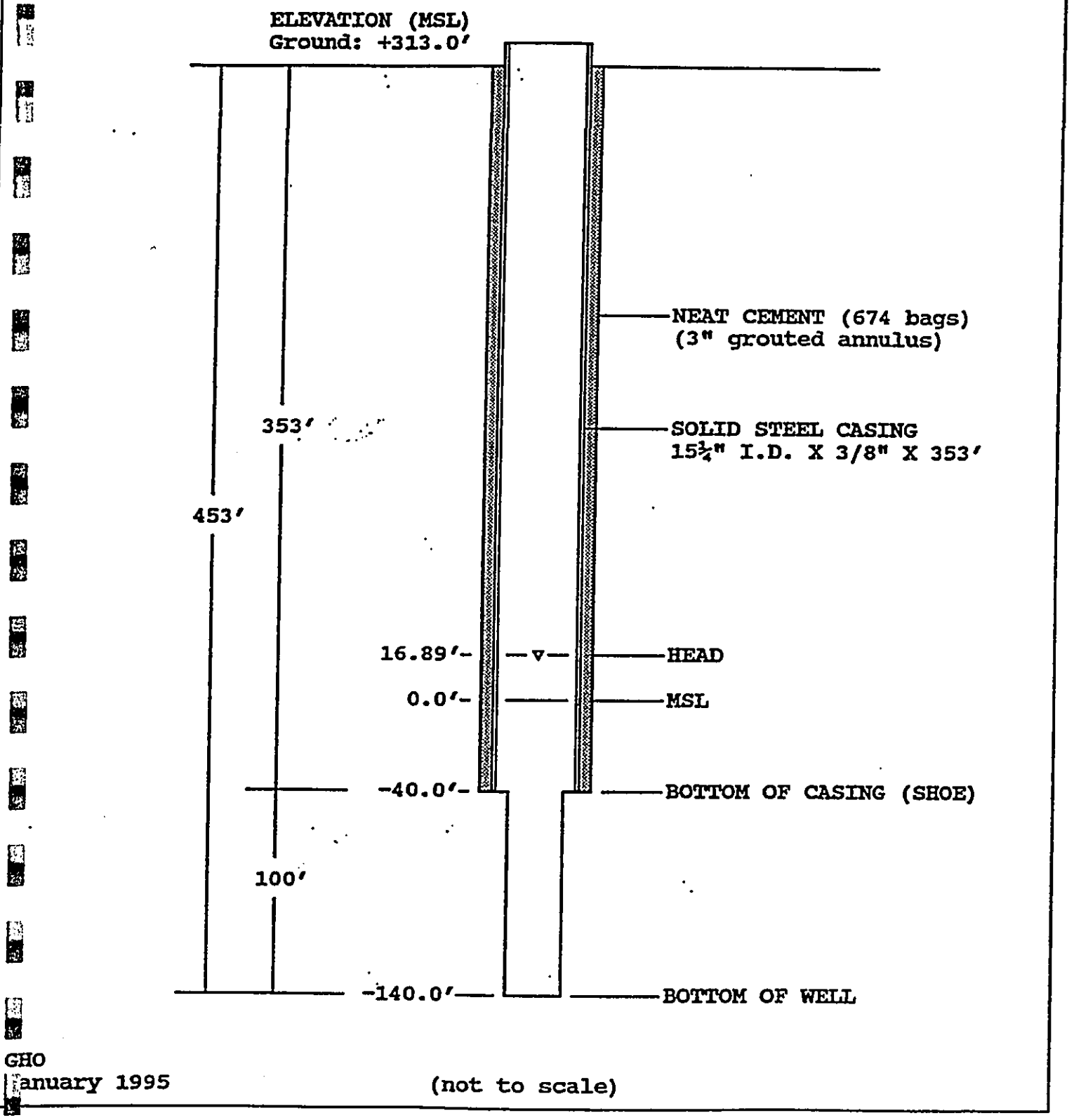
Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
Signature Tracy Ramos Date 2/09/95

For Driller's Use:
Job Name ____ Job No. ____

For Official Use: Well No. ____
Longitude ____ Latitude ____

WAIPAHU WELLS III NO. 2400-13 (WELL #4)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: November 7, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



GHO
January 1995

(not to scale)

WAIPAHU WELLS III NO. 2400-13
Well #4

Plumbness Test: November 7, 1994
Ground Elevation: 313.0± ft. (msl)
Casing Length: 353.0 ft.
Casing Diameter: 15¾ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100′: 10.17"

Depth (ft.)	Drift (inches)	Drift (inches per any 100 ft.)
0		
20	1.73	
40	3.24	
60	4.95	
80	6.19	
100	6.92	* 6.92
120	7.87	6.19
140	9.14	5.96
160	8.49	4.29
180	8.14	3.54
200	8.25	4.21
220	9.37	4.07
240	10.15	4.04
260	11.40	3.62
280	11.25	3.49
300	10.77	3.28
320	9.62	2.16
340	8.91	2.83
345	8.41	3.01 (per 85 ft.)

* A maximum drift of 6.92 inches per 100 feet of casing occurs between 0 feet and 100 feet.

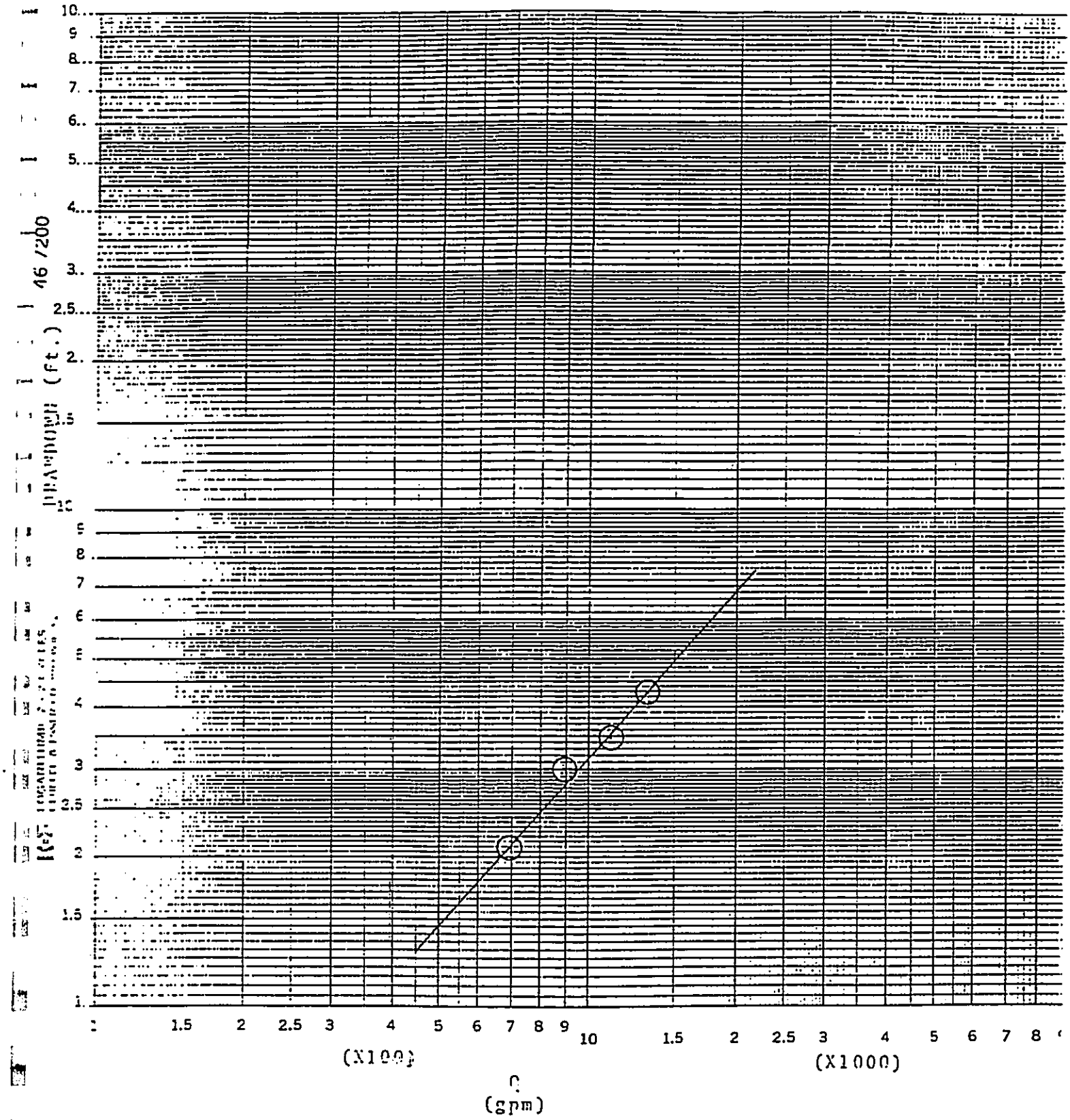
WAIPAHU WELLS III NO. 2400-13
WELL #4

Location	: TMK: 9-4-05:74
Elevation at ground	: +313.0 ft.
Elevation at bottom of well	: -140.0 ft.
Elevation at end of casing	: -40.0 ft.
Diameter of casing	: 15¼ in. I.D.
Head	: 16.89 ft.
Airline Depth	: 340 ft.
Pump Depth (suction)	: 352 ft.
Drilling completed	: November 7, 1994
Drilling company	: Roscoe Moss Hawaii, Inc.
Date of Yield-Drawdown test	: January 5, 1995

Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature (°F)	Remarks
					16.89' static head (airline)
0850					started pumping
0905					
0917	710	1.73	36	71.2	sample #1
0923	706	1.73		71.4	
0930	706	2.08		71.4	
0945	697	1.85		71.4	
1000	699	2.08		71.4	
1010	697	2.08	36		sample #2
1015					changed rate
1017	898	2.66		71.1	
1025	889	3.00		71.1	
1029	920				
1035	935	3.00		71.1	
1040	901				
1050	906	3.00		71.2	
1110	896	3.00	36	71.2	sample #3
1115					changed rate
1119	1105	3.35		71.0	
1140	1093	3.46		71.0	
1200	1101	3.46		71.0	
1210	1101	3.46	36	70.9	sample #4
1215					changed rate
1219	1307	4.27		71.0	
1230	1319	4.27		70.9	
1250	1310	4.27		70.8	
1310	1310	4.27		70.8	
1330	1310	4.27	36	70.8	sample #5
1335					stopped pumping

WAIPAHU WELLS III No. 2400-13
(Well #4)

SPECIFIC CAPACITY

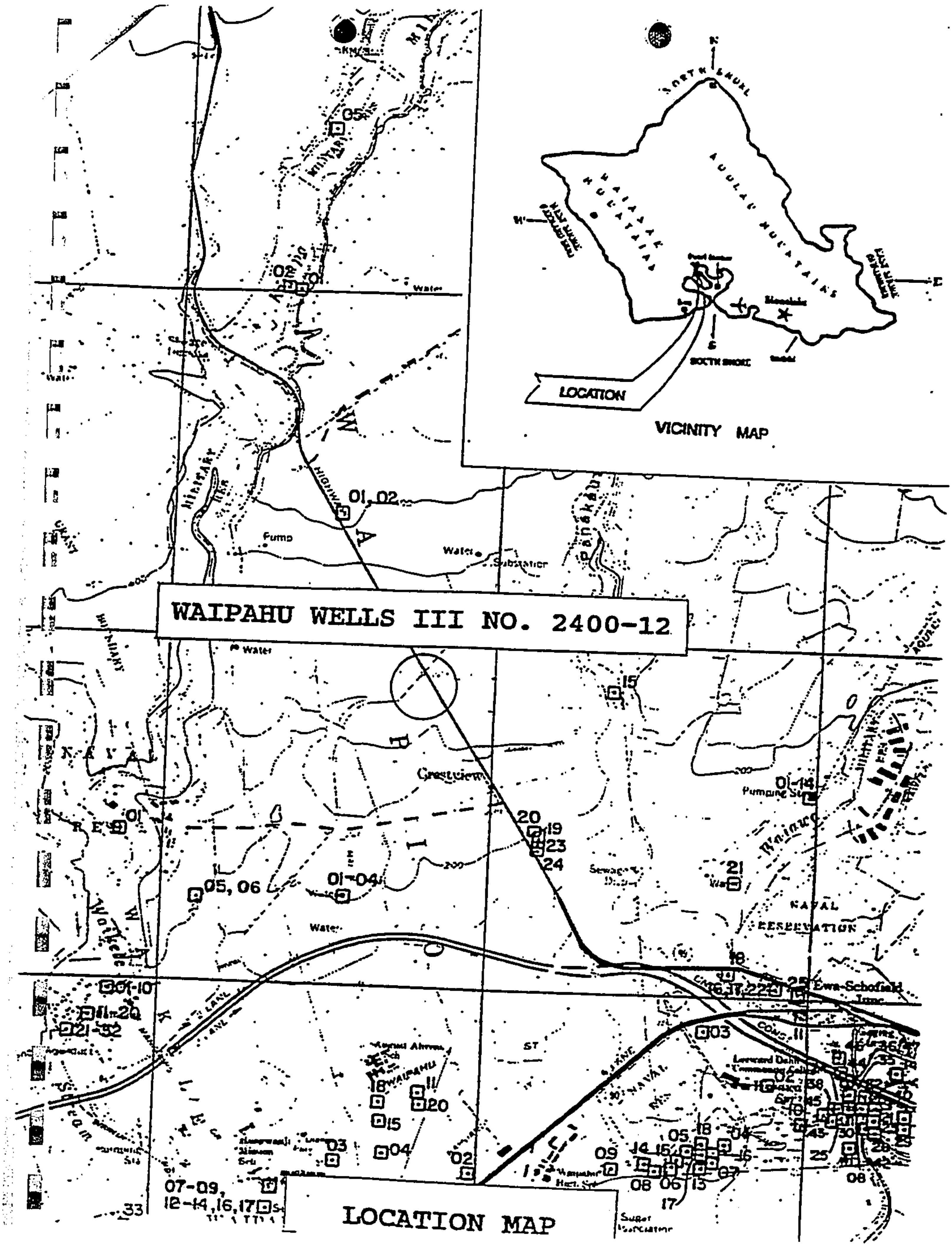


WAIPAHU WELLS III NO. 2400-13
WELL #4
LONG TERM PUMPING TEST: 1/10/95 to 1/13/95

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
1/10/95	(Tuesday)				
0950					16.54' static head (airline)
1000					started pumping
1010	995	2.42	36	70.9	sample #1
1030	1008	2.54		71.0	
1050	1015	2.65		70.9	
1110	1008	2.77		71.0	
1130	1015	2.88		71.0	
1200	1005	2.88			
1300	1008	3.00			
1400	1010	3.23			
1500	1008	3.35			
1600	1009	3.46			
1700	1010	3.58			
1800	1008	3.81			
1900	1006	3.81			
2000	1010	4.04			
2100	1008	4.04			
2200	1005	4.27			
2300	1005	4.27			
2400	1005	4.27			
1/11/95	(Wednesday)				
0100	1000	4.27			
0200	1000	4.27			
0300	1000	4.27			
0400	1000	4.27			
0500	1000	4.27			
0600	1000	4.27			
0700	1002	4.39			
0800	1001	4.39			
0900	1001	4.39			
1000	1012	4.39	38	71.0	sample #2
1100	1009	4.39			average
1200	1006	4.39			rate: 1006 gpm
1300	1002	4.39			
1400	1004	4.39			
1500	1000	4.27			
1600	1003	4.27			
1700	1004	4.39			
1800	1003	4.50			
1900	1004	4.50			
2000	1004	4.62			
2100	1005	4.62			
2200	1002	4.62			
2300	1001	4.62			
2400	1001	4.73			

1/12/95	(Thursday)				
0100	1002	4.73			
0200	1002	4.73			
0300	1002	4.85			
0400	1000	4.85			
0500	1017	4.85			
0600	1018	4.73			
0700	1010	4.73			
0800	1003	4.73			
0900	999	4.73			
1000	998	4.96	38	71.0	sample #3
1100	996	4.96			average 2 day
1200	994	4.96			rate: 1004 gpm
1300	996	4.85			
1400	1000	4.85			
1500	1001	4.85			
1600	1001	4.85			
1700	1001	4.85			
1800	1001	4.85			
1900	1002	4.96			
2000	1001	4.96			
2100	1000	5.08			
2200	1001	5.08			
2300	1009	5.08			
2400	1011	5.08			
1/13/95	(Friday)				
0100	1010	5.19			
0200	1019	4.96			
0300	1002	5.08			
0400	1003	5.08			
0500	1002	5.08			
0600	1003	5.08			
0700	1012	5.08			
0800	1009	5.08			
0900	1000	5.08			
0940	1007	5.08		71.0	
0955	1002	5.08	38	71.5	sample #4
1000					stopped pumping

Total pumpage (72 hours): 4,331,000 gallons
Average pumpage per day: 1,443,667 gallons
Average pumpage rate: 1,003 gallons per minute


WAIPAHU WELLS III NO. 2400-12
VICINITY MAP
LOCATION
N
E
Water
Pump
Substation
Crestview
Pumping Sta
Sewage Disp
NAVAL RESERVATION
Ewa-Schofield
Sugar
01, 02
01-04
05, 06
01-10
07-09,
12-14,16,17
LOCATION MAP

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0225.

1. STATE WELL NO. 2400-12 WELL NAME WAIPAHU III #5 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-05:74
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING 150 AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 10/22/94
(NOTE: Report must be submitted within 30 days after this date)

8. GROUND ELEVATION (msl) +314.4 ft.
Top of Drilling Platform (msl) 316.4 ft.
Height of Drilling Platform above Ground surface 2 ft.
Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)
0 to 37	RED BROWN SOFT	
37 to 86	BROWN GREY MED HARD	
86 to 147	BROWN GREY MED HARD	
147 to 165	BLUE GREY HARD	
165 to 288	BLUE GREY VERY HARD	
288 to 319	BLUE GREY SOME RED	297'
319 to 346	BLUE GREY MED HARD	297'
346 to 362	BLUE GREY HARD	297'
362 to 391	BLUE GREY MED HARD	297'
391 to 456	GREY BROWN MED HARD	297'
to		
to		

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND 456 ft.
11. HOLE SIZE: 22 inch dia. from 0 ft. to 356 ft. below ground
14 ¼ inch dia. from 356 ft. to 456 ft. below ground
inch dia. from ft. to ft. below ground
12. CASING INSTALLED:
15.25 in. I.D. x .375 in. wall solid section to 356 ft. below ground
NA in. I.D. x in. wall perforated section to ft. below ground
Type of Perforation NA
13. ANNULUS: Grouted from 0 ft. below ground to 356 ft. below ground
Gravel packed from NA ft. below ground to ft. below ground
14. INITIAL WATER LEVEL 295.2 ft. below ground. Date and time of measurement 10/10/94
15. INITIAL CHLORIDE 38 ppm Date and time of sampling 10/10/94
16. INITIAL TEMPERATURE 70.9° °F Date and time of sampling 10/10/94
17. DATE OF PUMP INSTALLATION
18. PUMP INSTALLATION:
Pump Type, Make, Serial No.
Motor type, H.P., Voltage, rpm Capacity gpm
Depth of Pump Intake Setting ft. below , which elevation is ft.
Depth of bottom of airline ft. below , which elevation is ft.
Pumping Head is ft.
19. PUMPING TESTS: Reference Point (R.P.) used: , which elevation is ft.

Date 10/10/94
Start water level ft. below R.P.
End water level ft. below R.P.
Depth of well ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Drawdown (ft.)	Cl- (ppm)	Temp. °F
to				
to				
to				
to DATA ATTACHED				
to				
to				

(If more space is needed, continue on back.)

Date 11/28/94
Start water level ft. below R.P.
End water level ft. below R.P.
Depth of well ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Drawdown (ft.)	Cl- (ppm)	Temp. °F
to				
to				
to				
to DATA ATTACHED				
to				
to				

(If more space is needed, continue on back.)

Remarks:
(If more space is needed, continue on back.)

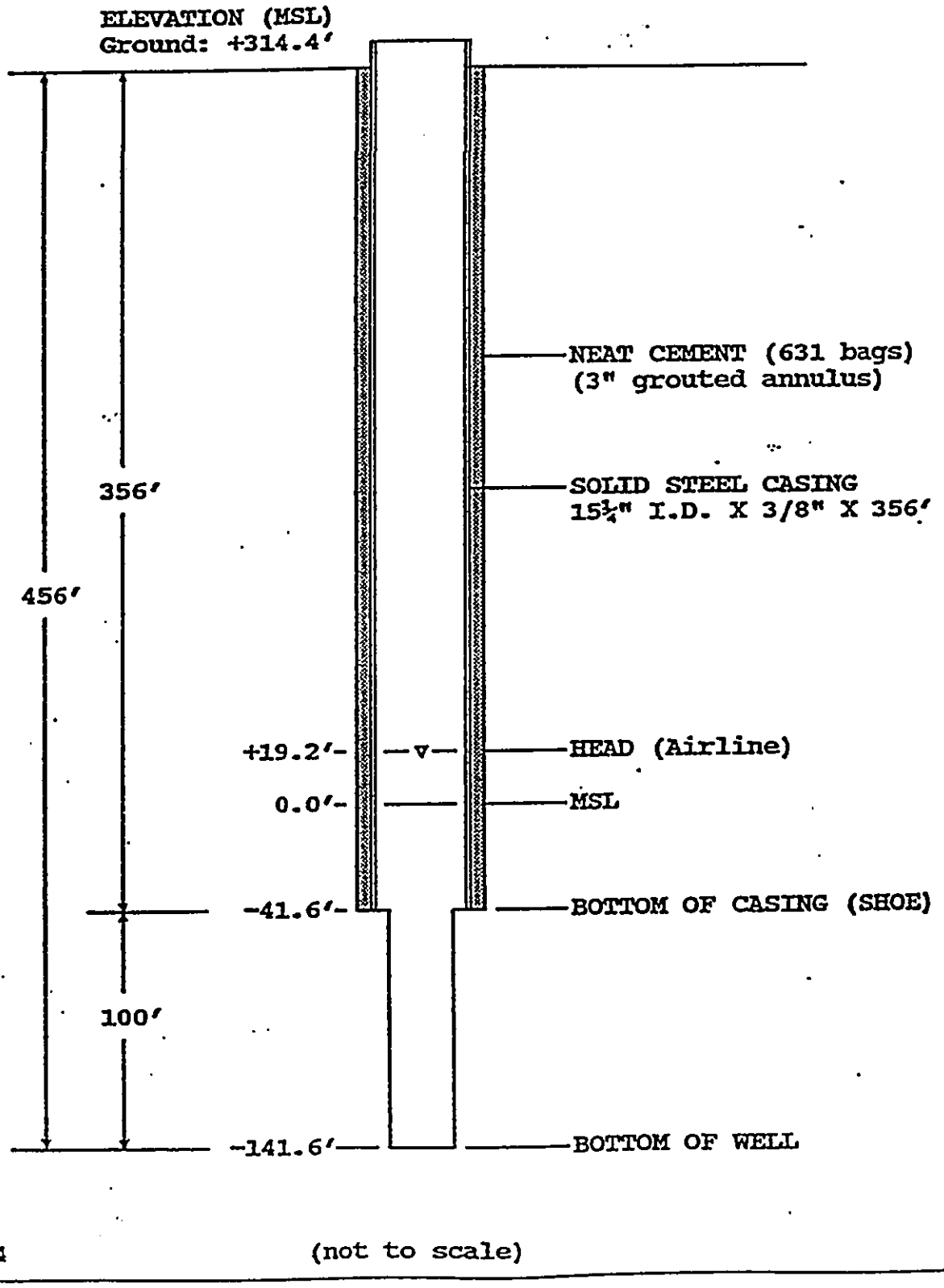
Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
Signature Tracy Lum Date 12/13/94

For Driller's Use:
Job Name Job No.

For Official Use:
Longitude 158 00 13 Well No. 2400-12
Latitude 21 24 55

WAIPAHU WELLS III NO. 2400-12 (WELL #5)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: October 22, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



tober 1994

(not to scale)

WAIPAHU WELLS III NO. 2400-12
Well #5

Plumbness Test: October 21, 1994
Ground Elevation: 314.4± ft. (msl)
Casing Length: 356.0 ft.
Casing Diameter: 15¾ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

Depth (ft.)	Drift (inches)	Drift (inches per any 100 ft.)
0		
20	.72	
40	1.75	
60	2.34	
80	2.71	
100	3.19	3.19
120	3.50	2.83
140	4.88	3.35
160	5.87	4.25
180	7.91	5.46
200	8.70	5.54
220	8.86	5.42
240	10.48	5.65
260	12.04	6.21
280	13.52	5.63
300	14.42	5.73
320	15.13	* 6.63
340	16.02	5.90
350	16.47	4.49 (per 90 ft.)

* A maximum drift of 6.63 inches per 100 feet of casing occurs between 220 feet and 320 feet.

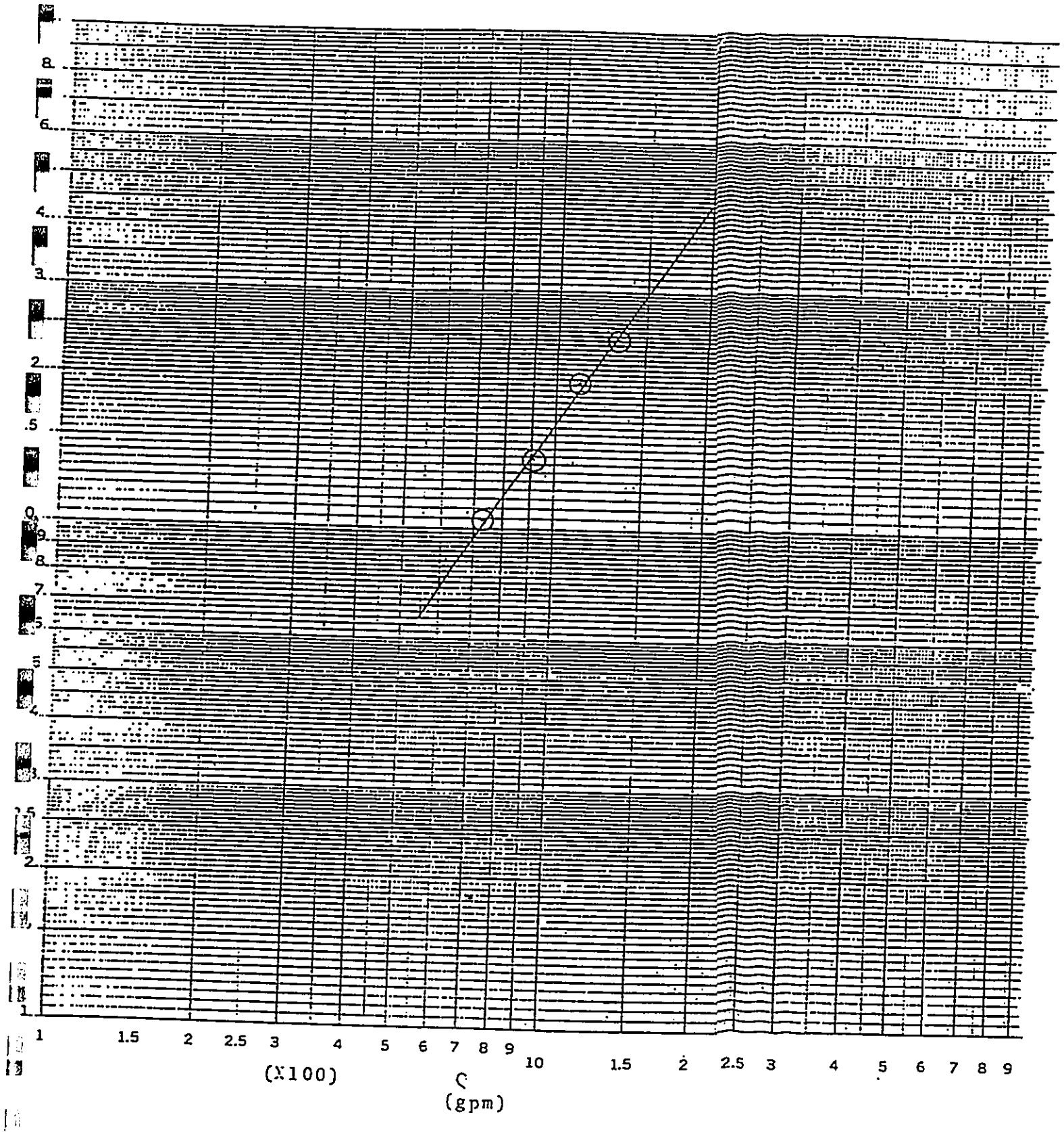
WAIPAHU WELLS III NO. 2400-12
WELL #5

Location	: THK: 9-4-05:74
Elevation at ground	: +314.4 ft.
Elevation at bottom of well	: -141.6 ft.
Elevation at end of casing	: -41.6 ft.
Diameter of casing	: 15¼ in. I.D.
Head	: +19.2 ft.
Airline Depth	: 340 ft.
Pump Depth (suction)	: 352 ft.
Drilling completed	: October 22, 1994
Drilling company	: Roscoe Moss Hawaii, Inc.
Date of Yield-Drawdown test	: November 10, 1994

Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature (°F)	Remarks
0905	(19.40 psi, 44.81 ft.)				19.2' static head (airline)
0928	same as above				started pumping
0930					
0936	705	1.04	38	70.9	sample #1
0945	787	1.15		70.8	
1000	711	1.15		70.8	
1015	726	1.15		70.8	
1025	726	1.15	38	–	sample #2
1030					changed rate
1034	908	1.38		70.7	
1045	910	1.38		70.7	
1100	901	1.38		70.7	
1115	902	1.38		70.7	
1125	902	1.38	36		sample #3
1130					changed rate
1134		1.84			
1137	1095	1.96		70.7	
1145	1095	1.96		70.7	
1200	1105	1.96		70.7	
1215	1089	1.96		70.7	
1225	1109	1.96	36	70.6	sample #4
1230					changed rate
1236	1345	2.42		70.6	
1255	1333	2.42		70.7	
1315	1336	2.42		70.7	
1325	1333	2.42	36	70.7	sample #5
1330					stopped pumping
1331		.80			
1332		.00			

WAIPAHU WELLS-III NO. 2400-12

SPECIFIC CAPACITY



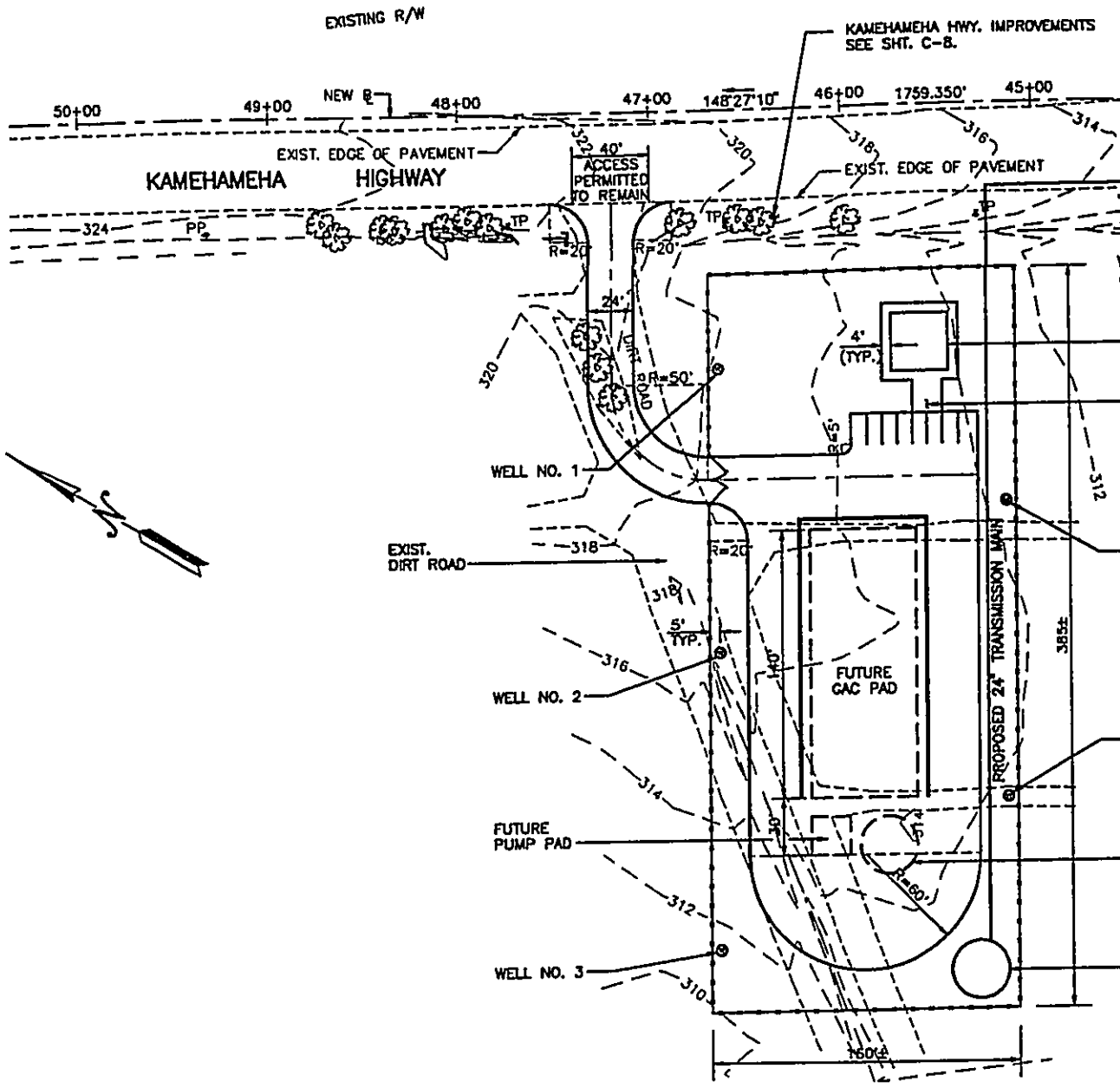
WAIPAHU WELLS III NO. 2400-12
WELL #5
LONG TERM PUMPING TEST: 11/28/94 to 12/01/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
11/28/94 (Monday)					
0945					19.2' static head (airline)
1000					started pumping
1004	1027	1.38	38	70.8	sample #1
1009	1038				
1015	1038	1.84		70.7	
1030	1045	1.84		70.7	
1045	1045	1.84		70.7	
1100	1045	1.61		70.7	
1130	1038	1.61		70.6	
1200	1034	1.61		70.7	
1330	1022	1.61		70.7	
1500	1000				
1800	1000	1.50			
2100	1035	1.61			
2400	1043	1.73			
11/29/94 (Tuesday)					
0300	1043	1.73			
0600	1043	1.73			
0900	1034	1.64			
1000	1027	1.61	36	70.7	sample #2
1200	1000	1.68			average rate:
1500	1026	1.80			1036 gpm
1800	1034	1.73			
2100	1017	1.61			
2400	1026	1.64			
11/30/94 (Wednesday)					
0300	1026	1.84			
0600	1034	1.84			
0900	1053	1.73			
1000	1031	1.61	36	70.7	sample #3
1200	1034	1.66			average 2 day
1500	1026	1.73			rate: 1035 gpm
1800	1017	1.66			
2100	1026	1.59			
2400	1008	1.82			
12/01/94 (Thursday)					
0300	1000	1.80			
0600	1008	1.61			
0900	1017	1.80			
0945	1017	1.50			
1005	1017	1.61	36	70.7	sample #4
1010					stopped pumping
1011		.46			
1012		.00			

Total pumpage (72.17 hours): 4,452,000 gallons
Average pumpage per day: 1,480,667 gallons
Average pumpage rate: 1,028 gallons per minute

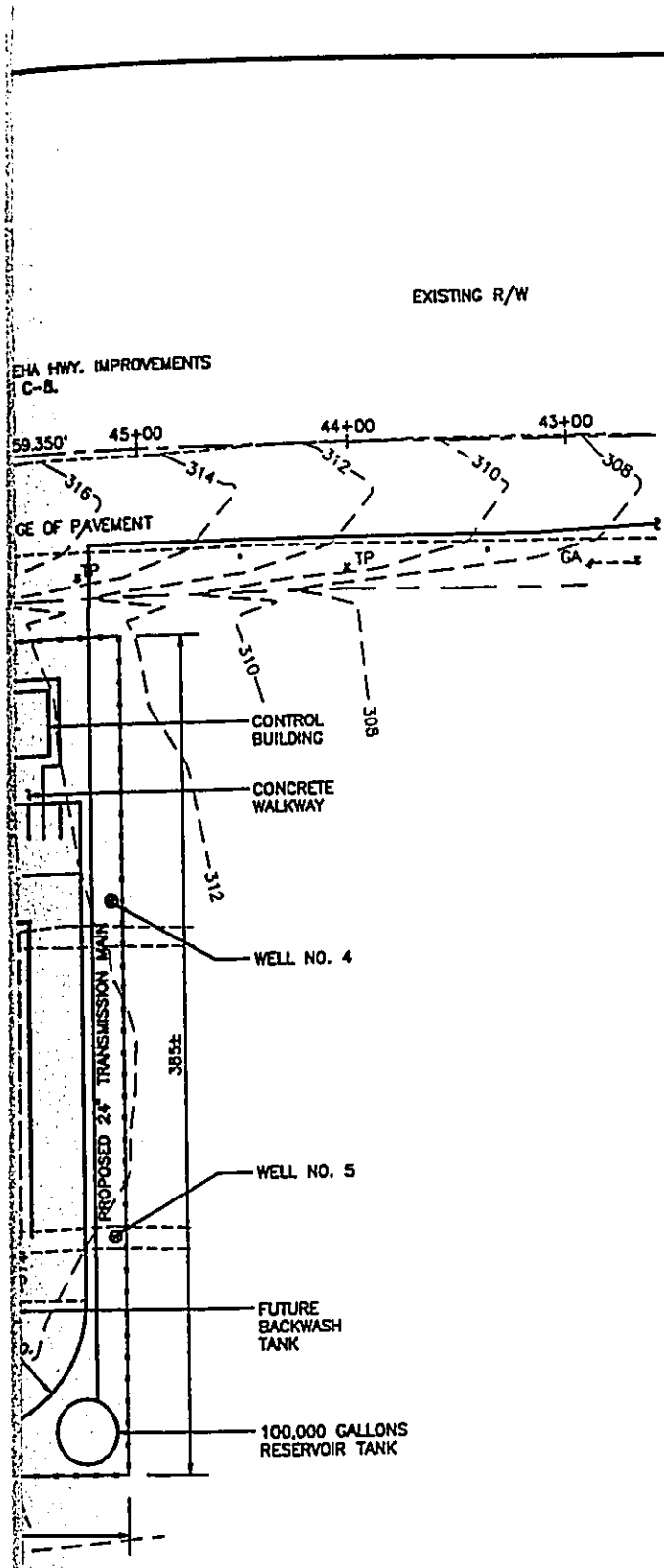
APPENDIX E

CONSTRUCTION PLANS



WAIPAHU WELLS III SITEPLAN

SCALE: 1" = 40'-0"



III SITEPLAN

GRAPHIC SCALE

40' 0 40' 80' 120'

SCALE: 1"=40'

Prepared by:

GM&D INC. ASSOCIATES, INC. Engineers/Architects

841 BISHOP STREET, #1101 HONOLULU, HAWAII 96813 PH. 531-1308 FAX. 531-1308

C-3

ALVIN K. ARAKAKI REGISTERED PROFESSIONAL ENGINEER No. 3024-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

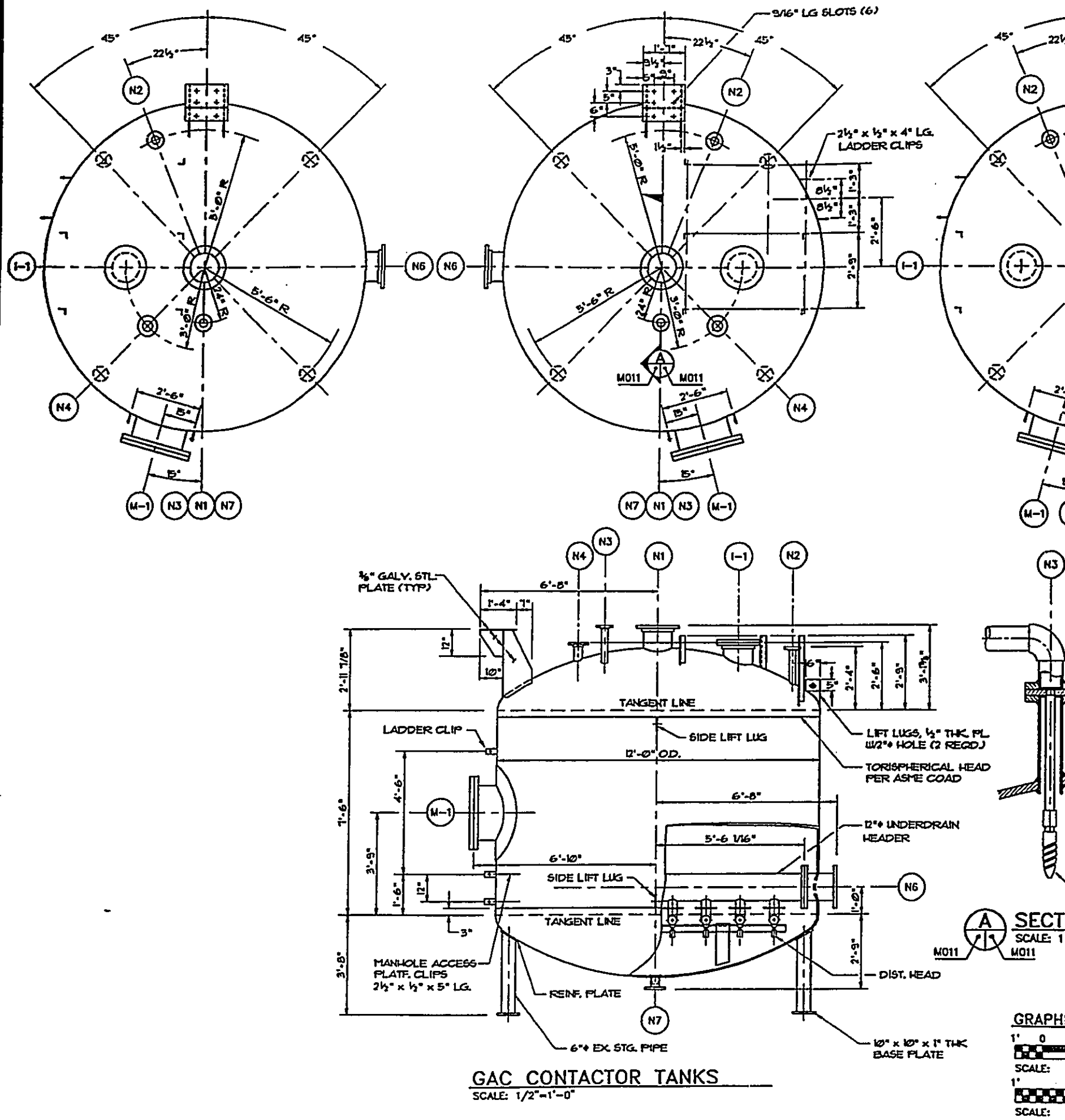
JOB 95-91A
WAIPAHU WELLS III

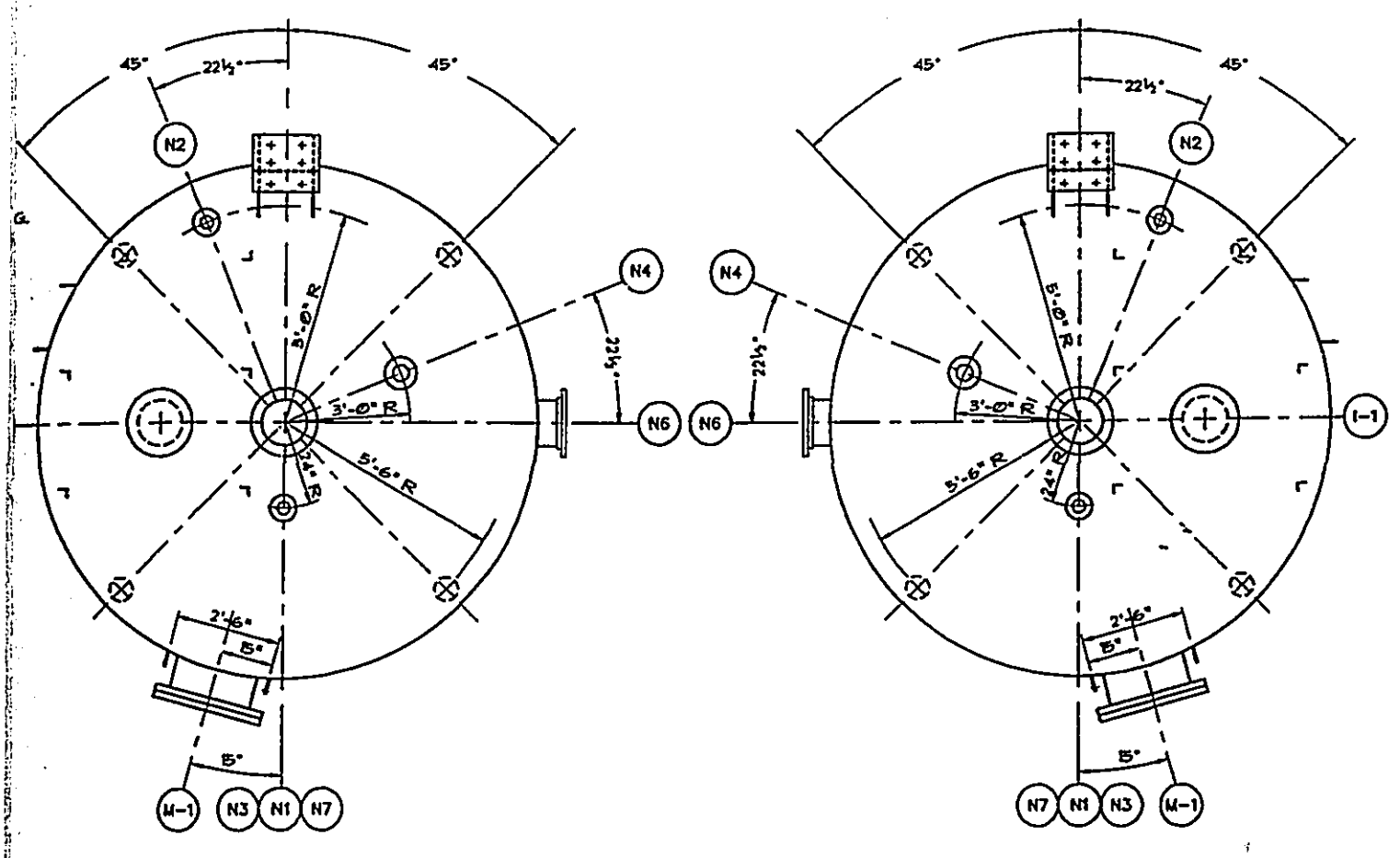
WAIPAHU WELLS III SITE PLAN

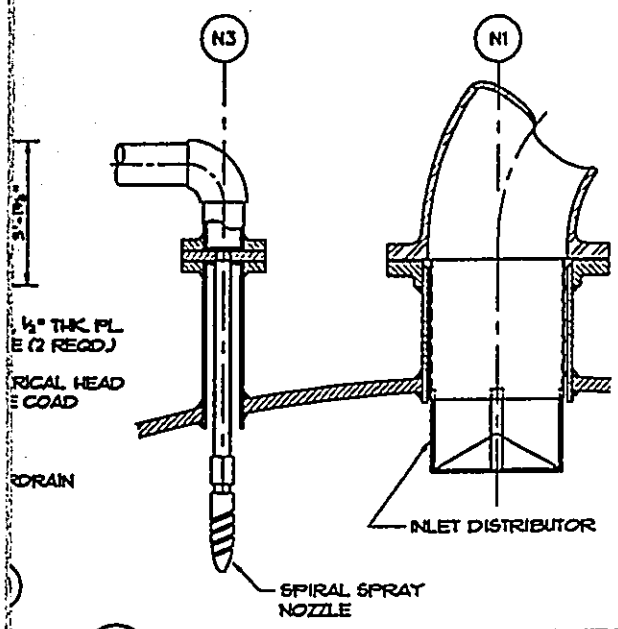
APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: _____

DRAWN BY: NFP	ENGINEER: HIT	CHECKED BY: AKA	FILE NO.
FIELD BOOK NO.	SCALE: AS NOTED	SHEET ____ OF ____ SHEETS	

2380F669 02/07/95 11:11 60%


45°
22½°
N2
N6
N4
N7
N1
N3
M-1
I-1
5'-0" R
5'-6" R
2'-6"
8"
3/16" LG SLOTS (6)
2½" x ½" x 4" LG. LADDER CLIPS
M011
A
1
3/8" GALV. STL. PLATE (TYP)
6'-8"
1'-4"
7"
12"
10"
2'-11 7/8"
TANGENT LINE
LADDER CLIP
SIDE LIFT LUG
12'-0" O.D.
LIFT LUGS, ½" THK. PL. W/2"ø HOLE (2 REQD.)
TORISPHERICAL HEAD PER ASME CODAD
4'-6"
1'-6"
3'-9"
6'-10"
5'-6 1/16"
12"ø UNDERDRAIN HEADER
3"
3'-8"
MANHOLE ACCESS PLATF. CLIPS 2½" x ½" x 5" LG.
REINF. PLATE
6"ø EX. STG. PIPE
DIST. HEAD
10" x 10" x 1" THK. BASE PLATE
GAC CONTACTOR TANKS
SCALE: 1/2"=1'-0"





A SECTION–INFLUENT INLETS

SCALE: 1 1/2"=1'-0"

M011 M011

EAD

× 1" THK
LATE

GRAPHIC SCALE

1" 0 1" 2" 3" 4" 5"

SCALE: 1/2"=1'-0"

1" 0 1" 2"

SCALE: 1 1/2"=1'-0"

NOZZLE SCHEDULE			
NOZZLE	SIZE	RATING AND DESCRIPTION	REMARKS
N1	12"	FLANGE, 150#, SUP-ON, FLAT FACE	INFLUENT
N2	3"	FLANGE, 150#, SUP-ON, FLAT FACE	PRESS. RELIEF
N3	3"	FLANGE, 150#, SUP-ON, FLAT FACE	SPRAY NOZZLE
N4	4"	FLANGE, 150#, SUP-ON, FLAT FACE	CARBON FILL
N6	12"	FLANGE, 150#, SUP-ON, FLAT FACE	EFFLUENT OUTLET
N7	4"	FLANGE, 150#, SUP-ON, FLAT FACE	CARBON DRAIN
M-1	24"	FLANGE, 150#, SUP-ON, FLAT FACE	MANWAY W/HINGED COVER
I-1	12"	FLANGE, 150#, SUP-ON, FLAT FACE	INSPECTION W/BLIND FLG.

TANK SPECS.	
MATERIALS	
SHELL	STEEL, ASTM A516 GR. 70
HEAD	TORRESPHERICAL (FLANGED DISHED)
BOLTING	A-307B
SUPPORT	STEEL
PRESSURE	
TEST	150 PSI
OPERATING	100 PSI

Prepared by:

ASSOCIATES, INC.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB
WAIPAHU WELLS III

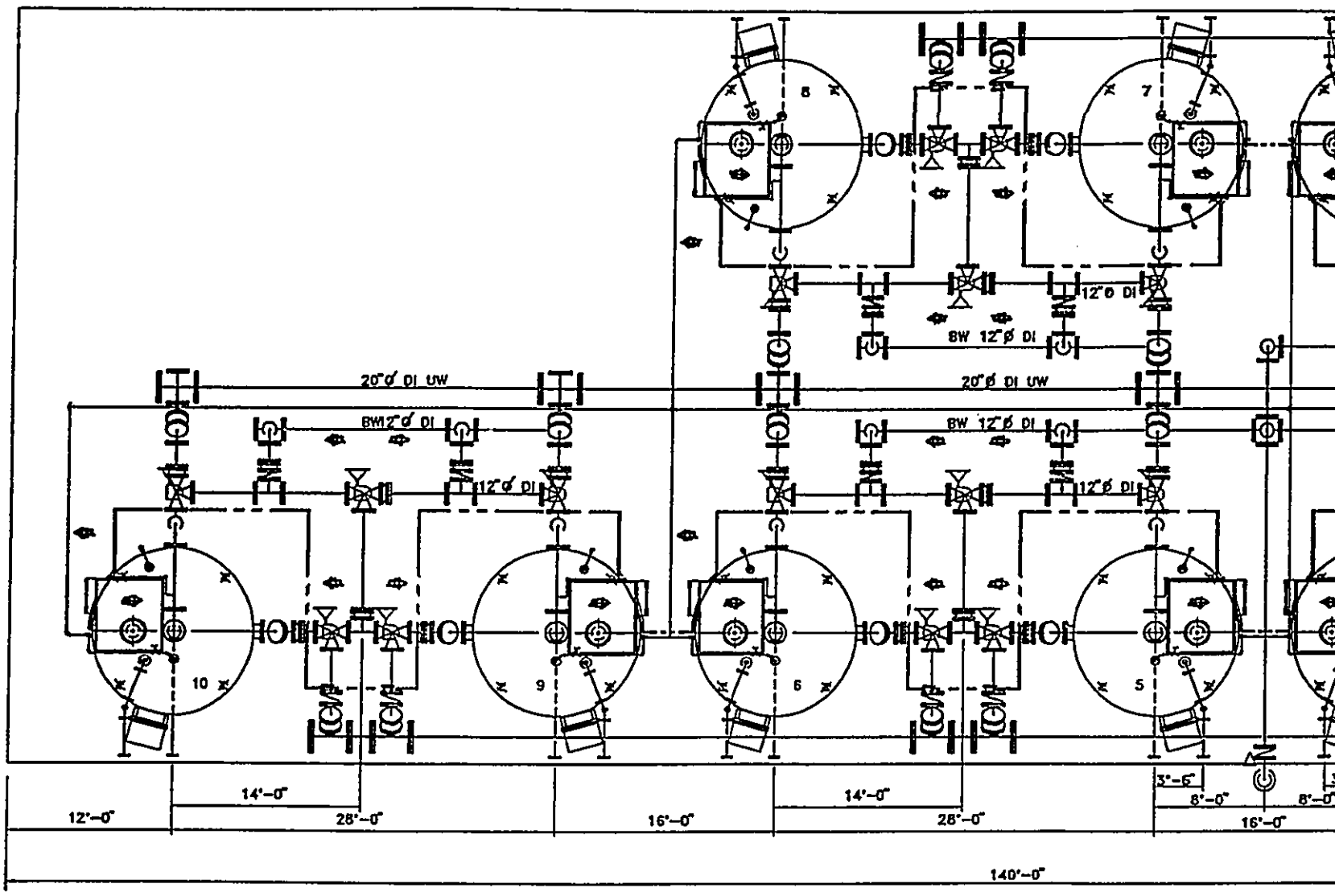
GAC CONTACTOR TANKS

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DESIGN BY J.G. ENGINEER CHECKED BY: FILE NO.

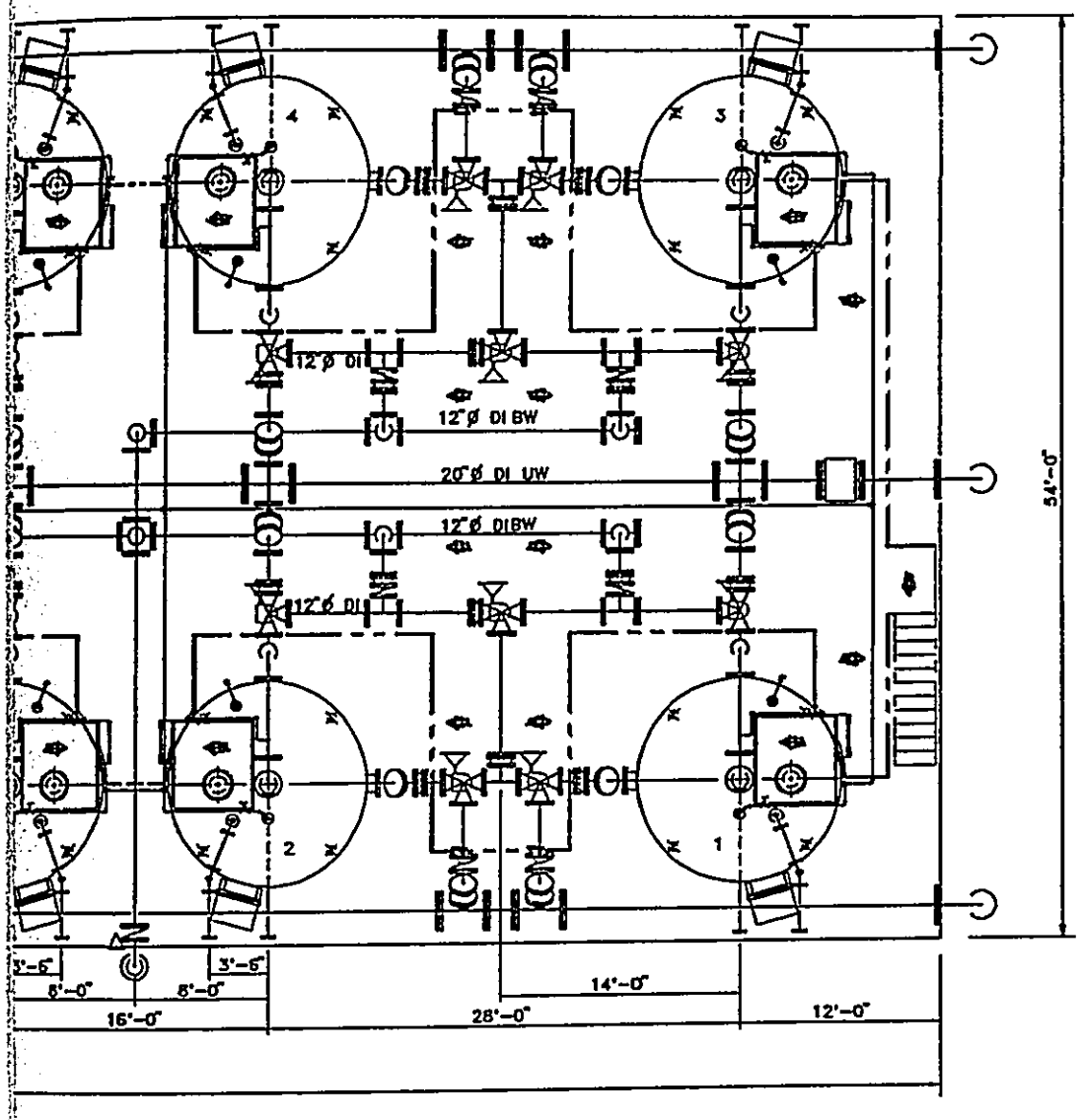
FIELD BOOK NO. SCALE: AS NOTED SHEET _____ OF _____ SHEETS

2380H00B 02/09/95 15:51 PRELIMINARY



PLAN–TANK PAD

SCALE: 3/16"=1'-0"



Prepared by:

ASSOCIATES, INC.
Engineers/Architects

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

WAIPAHU WELLS III

PLAN–TANK PAD

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: J.D.	ENGINEER:	CHECKED BY: T.K.	FILE NO:
FIELD BOOK NO:	SCALE: 3/16=1'-0"	SHEET _____ OF _____ SHEETS	

2380H007 02/09/95 12:46 PRELIMINARY

JOB NO. 95 -

KAMEHAMEHA HIGHWAY : 24 IN

FROM: WAIPIO UKA STREET TO

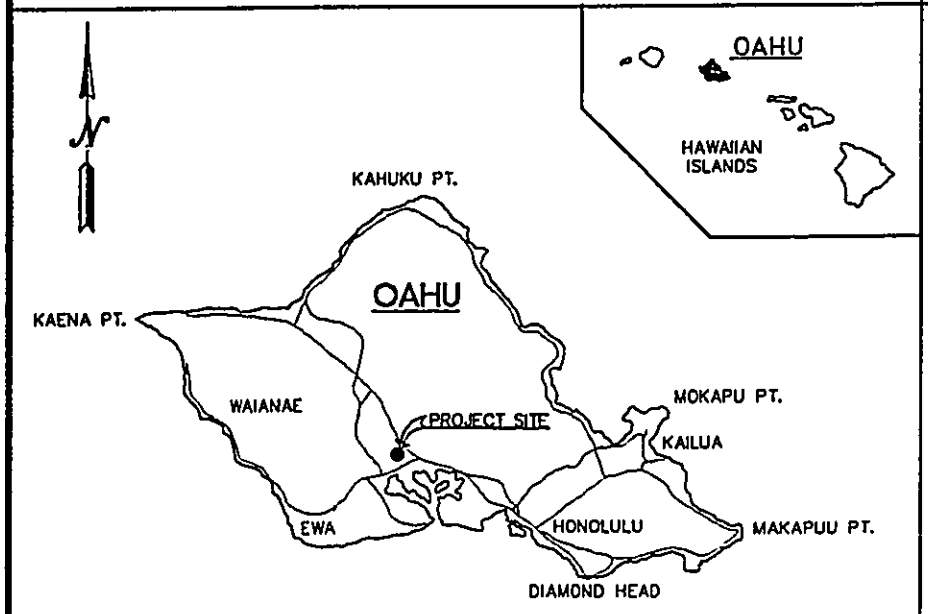
BOARD OF WATER
CITY AND COUNTY OF
HONOLULU, HA

PREPARED BY:

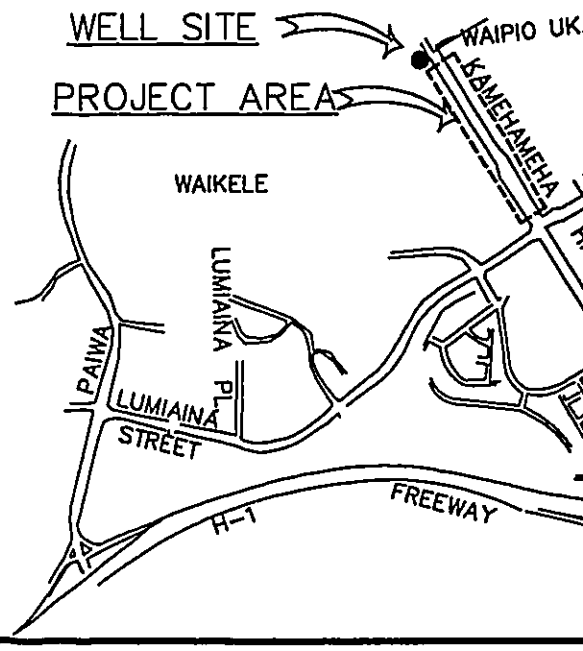
GMP ASSOCIATES

ENGINEERS/ARCHITECTS
HONOLULU, HAWAII

VICINITY MAP



LOCATION MAP



O. 95 - 91B

24 INCH TRANSMISSION MAIN

REET TO LUMIAINA STREET

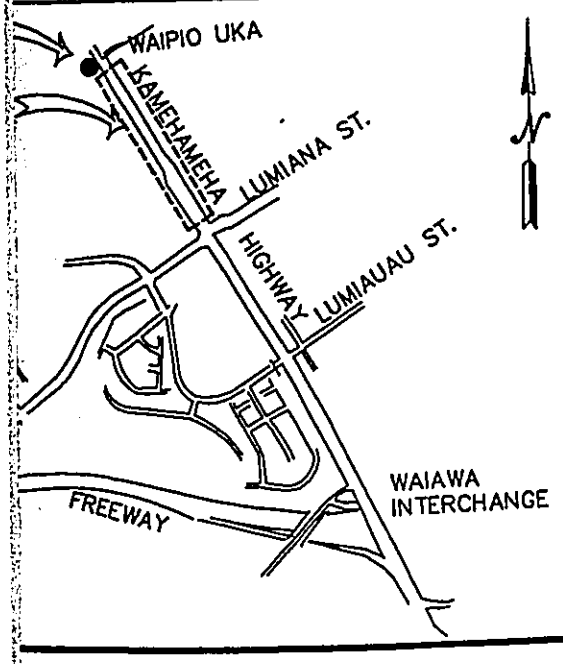
WATER SUPPLY
NTY OF HONOLULU
ULU, HAWAII

PARED BY:

OCIATES, INC.

RS/ARCHITECTS
LULU, HAWAII

TION MAP



APPROVED

MANAGER AND CHIEF OF ENGINEERING
BOARD OF WATER SUPPLY — DATE

CHIEF, HIGHWAYS DIVISION
STATE DEPARTMENT OF TRANSPORTATION
(APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY ID NO. , LETTER OF APPROVAL NO. HWY-CM , DATED .) — DATE

TITLE-P1 02/10/95 13:54 100%

SHEET 1 OF

T-1

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
		TITLE
1	T-1	TITLE SHEET, LOCATION MAP AND VICINITY MAP
2	T-2	INDEX OF DRAWINGS AND NOTES
3	T-3	LOCATION PLAN AND LEGEND
		CIVIL
4	C-1	TYPICAL WATER SECTIONS - 1
5	C-2	TYPICAL WATER SECTIONS - 2
6	C-3	PLAN AND PROFILE - STA. 0+00 TO 6+00
7	C-4	PLAN AND PROFILE - STA. 6+00 TO 16+00
8	C-5	PLAN AND PROFILE - STA. 16+00 TO 23+00
9	C-6	TRAFFIC CONTROL PLAN AND NOTES
10	C-7	TRAFFIC CONTROL PLAN - 2
11	C-8	TRAFFIC SIGNAL LOOP PLAN AT WAIPIO UKA
12	C-9	TRAFFIC SIGNAL LOOP PLAN AT LUMIAINA STREET

HTCO NOTES:

1. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELEPHONE COMPANY (HTCO) AT 483-8085 TWO WEEKS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING TELEPHONE CABLES AND/OR DUCT LINES.
2. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND TELEPHONE CABLES IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE.
3. ALL EXCAVATION WITHIN TWO FEET OF TELEPHONE CABLES SHALL BE DONE BY HAND.
4. FOR RELOCATION OF ANY TELEPHONE CABLES AND/OR DUCT LINES, THE CONTRACTOR SHALL NOTIFY HTCO THIRTY (30) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, ARRANGE FOR TRAFFIC PERMITS AND RESTORE SIDEWALK, PAVEMENT OR OTHER FACILITIES.
5. THE CONTRACTOR SHALL NOTIFY HTCO IMMEDIATELY AT 611 AFTER ANY DAMAGES TO HTCO CABLES, DUCT LINES, PULLBOXES, MANHOLES, HANDHOLES, POLES AND GUYS. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL DAMAGES TO HTCO FACILITIES.
6. REPAIR WORK ON DAMAGED CABLES SHALL BE DONE BY HTCO AND ANY OTHER WORK INVOLVING EXISTING UNDERGROUND FACILITIES SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE. COST FOR ALL REPAIR WORK SHALL BE BORNE BY THE CONTRACTOR.
7. PROVIDE ADEQUATE SUPPORT AND PROTECTION FOR TELEPHONE CABLES AND/OR DUCT LINES EXPOSED IN THE TRENCH. SUCH SUPPORT AND PROTECTION SHALL BE APPROVED BY HTCO INSPECTOR.
8. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT CLEARANCE FROM HTCO RECORDS SECTION LOCATED AT 3239 UALENA STREET, 3RD FLOOR (ABY-3) TWO WEEKS PRIOR TO START OF CONSTRUCTION. HOURS OF BUSINESS IS 7:00 A.M. TO 11:00 A.M. AND 11:30 A.M. TO 3:00 P.M. MONDAY THRU FRIDAY EXCEPT HOLIDAYS.
9. THE COSTS OF ANY TEMPORARY RELOCATION OF HTCO FACILITIES DONE FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE BORNE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
10. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HTCO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HTCO, OR BY THE CONTRACTOR UNDER HTCO'S SUPERVISION, WITH ALL COSTS AND COORDINATION TO BE BORNE BY THE CONTRACTOR.
11. ANY WORK REQUIRED TO RELOCATE HTCO FACILITIES CONFLICTING WITH THE PROPOSED CONSTRUCTION AND THE EXISTENCE OF WHICH WERE NOT SHOWN ON THE PLANS SHALL BE BORNE BY THE CONTRACTOR.

WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS," VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION," VOLUME 2, DATED 1985, AND THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS," VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
3. PAYMENT FOR ITEMS OF WORK CALLED FOR IN THE PLANS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY, BUT SHALL BE INCLUDED IN THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL COMPENSATION SHALL BE MADE.
4. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA, BUT ARE NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, *THAT NONE EXIST.*
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS HE MAY MAKE OR DERIVE FROM THE SUBSURFACE INFORMATION OR DATA FURNISHED ON THE PLANS. THE CONTRACTOR MUST SATISFY HIMSELF THROUGH HIS OWN INVESTIGATIONS AS TO WHAT SUBSURFACE CONDITIONS ARE TO BE ENCOUNTERED.
6. PRIOR TO START OF EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL AGENCIES AND UTILITIES AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL OF HIS CONSTRUCTION ACTIVITY AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
7. THE CONTRACTOR SHALL EXPOSE, VERIFY AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO EXCAVATION OF PIPELINE TRENCH. THE WATER MAIN ALIGNMENT AND GRADE MAY BE CHANGED IF THERE ARE ANY CONFLICTS WITH ANY EXISTING UNDERGROUND UTILITIES AND STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT. PAYMENT FOR WORK INCLUDED IN THIS PARAGRAPH WILL BE MADE UNDER THE APPROPRIATE BID ITEMS UNDER THE PROPOSAL, AND NO ADDITIONAL COMPENSATION WILL BE CONSIDERED.
8. EXISTING UTILITIES CROSSING THE WATER MAIN ARE TO REMAIN IN SERVICE AND IN PLACE. IF RELOCATED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE FOR A MINIMUM PERIOD OF TIME AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE BOARD OF WATER SUPPLY.
9. ANY COST WHEN DIRECTED BY THE BOARD OF WATER SUPPLY INCURRED BY GASCO, HECO, OR HTCO BY THIS PROJECT SHALL BE PAID BY THE BOARD OF WATER SUPPLY THROUGH THE CONTRACTOR. THE PAYMENT SHALL BE ONLY FOR THE ACTUAL COST AS SHOWN ON THE UTILITY COMPANY' INVOICE. NO PAYMENT WILL BE MADE FOR PROFIT, TAX, OVERHEAD AND BOND COST.
10. IF THE CONTRACTOR ELECTS NOT TO EXPOSE AND VERIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO PIPELINE EXCAVATION, HE FORFEITS HIS RIGHTS FOR ANY CLAIMS FOR COMPENSATION CAUSED BY ANY CONFLICTS WITH EXISTING UTILITIES AND STRUCTURES.
11. ALL A.C. AND CONCRETE PAVEMENT TO BE TRENCHED (FOR PIPELINE OR ANY WATER SYSTEM INSTALLATION) SHALL BE "SAW-CUT" TO THE REQUIRED WIDTH PRIOR TO REPAVING.
12. PAYMENT FOR RESTORATION OF DRIVEWAYS, CURBS AND GUTTERS WILL NOT BE MADE DIRECTLY, BUT SHALL BE INCLUDED IN THE UNIT PRICES BID IN THE VARIOUS ITEMS OF THE BID.
13. RESTORATION OF PAVEMENT SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND DONE WITH EQUIVALENT TO, OR BETTER, QUALITY MATERIALS.
14. UNLESS OTHERWISE SPECIFIED, CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH BOARD OF WATER SUPPLY'S INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT THE BWS PLANNING AND ENGINEERING DIVISION, ENGINEERING BRANCH, CONSTRUCTION SECTION.
15. ALL WATER MAIN TRENCHES IN STATE-OWNED rIGHWAYS SHALL BE BACKFILLED ACCORDING TO THE TRENCH RESTORATION DETAIL AS SHOWN ON THE PLANS. WATER MAIN TRENCHES IN PRIVATELY-OWNED STREETS SHALL BE BACKFILLED AS CALLED FOR UNDER PART III, SECTION 1.2.2, TRENCH BACKFILL, OF THE "WATER SYSTEM STANDARDS," DATED 1985. COMPACTION OF TRENCH BACKFILL SHALL MEET APPLICABLE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS.

WATER NO

17. SHOULD MAJOR T CONSTRUCTION, T PAINT.
18. PIPE ALTERNATIV A. DUCTILE IRON
    B. POLYVINYL C PIPES AND F OF POLYVIN OF P.V.C. P BID ON BY WORK, ADDI IN THE PLA DESIGN WOR BE CONSIDE FOR P.V.C. RESPONSIBI BE INSTALL
    C. CONCRETE C MANUFACTUR *EXPOSED A*

    PAYMENT FOR P BID FOR D.I. PIP
19. DURING NON-WO COVERED WITH N FOR TRAFFIC.
20. UNLESS OTHERW PLUGGED WITH C PLUGGING WILL I VARIOUS ITEMS SIZE AND TYPE
21. ALL SALVAGE MA THE KALIHI BWS
22. ALL WATER MAIN HYDROSTATIC TE PRESENCE OF T
23. MECHANICAL JO SHAPE, AS DES CAST IRON AND TO-JOB BASIS.
24. ALL AIR RELIEF OF 0 TO 150 P

WATER NOTES (CONT.)

17. SHOULD MAJOR TREE ROOTS 2" AND GREATER BE ENCOUNTERED DURING CONSTRUCTION, THESE ROOTS SHALL BE CUT AND SEALED WITH ASPHALTIC PAINT.

18. PIPE ALTERNATIVES:
    A. DUCTILE IRON PIPES SHALL BE CLASS 52, WRAPPED WITH POLYETHYLENE.

    B. POLYVINYL CHLORIDE PIPES SHALL BE CLASS 150. ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF P.V.C. PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR P.V.C. PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.

    C. CONCRETE CYLINDER PIPES SHALL BE CLASS 150 AND SHALL BE MANUFACTURED AFTER ALL UNDERGROUND STRUCTURES AND UTILITIES ARE EXPOSED AND VERIFIED.

    PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR D.I. PIPE., VALVES AND FITTINGS.

19. DURING NON-WORKING HOURS, THE TRENCHES ON STATE HIGHWAYS SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC.

20. UNLESS OTHERWISE SPECIFIED, ALL ABANDONED LINES SHALL BE CUT AND PLUGGED WITH CLASS DWS 2000 CONCRETE. PAYMENT FOR CUTTING AND PLUGGING WILL NOT BE MADE DIRECTLY, BUT WILL BE INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL. THE CONTRACTOR SHALL VERIFY THE SIZE AND TYPE OF LINE TO BE PLUGGED.

21. ALL SALVAGE MATERIALS SHALL BE CLEANED, REPAINTED AND DELIVER TO THE KALIHI BWS CORPORATION YARD.

22. ALL WATER MAINS AND APPURTENANCES, SHALL BE SUBJECTED TO A HYDROSTATIC TEST PRESSURE OF 150 PSI BY THE CONTRACTOR IN THE PRESENCE OF THE BOARD OF WATER SUPPLY INSPECTOR.

23. MECHANICAL JOINT GLANDS SHALL BE "STRAIGHT-SIDED" AND POLYGON IN SHAPE, AS DESCRIBED IN AWWA C111, AND SHALL BE APPLICABLE TO BOTH CAST IRON AND DUCTILE IRON GLANDS, OR AN APPROVED EQUAL ON A JOB-TO-JOB BASIS.

24. ALL AIR RELIEF VALVES SHALL HAVE A MINIMUM WORKING PRESSURE RANGE OF 0 TO 150 PSI.

HECO NOTES:

1. THE LOCATION OF HAWAIIAN ELECTRIC COMPANY'S (HECO) OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT WITHIN OR UNDER ANY OVERHEAD LINES.

2. THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAW (DOSH).

3. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HECO'S MAPPING AND RECORDS DIVISION LOCATED AT 820 WARD AVENUE, 4TH FLOOR, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. REFER TO HECO REQUEST NUMBER AT THAT TIME.

4. FOR VERIFICATION OF UNDERGROUND LINES OR FOR ASSISTANCE IN SUPPORTING AND PROTECTING THESE LINES, THE CONTRACTOR SHALL CALL HECO'S UNDERGROUND DIVISION AT 543-7345 A MINIMUM OF 72 HOURS IN ADVANCE.

5. WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HECO EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENTS, AND FOR PROTECTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNING TO FULLY PROTECT THESE FROM DAMAGE.

6. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HECO DISTRICT CONSTRUCTION SUPERINTENDENT (AT KOOLAU, PHONE 261-6085) A MINIMUM OF 72 HOURS IN ADVANCE.

7. ANY WORK REQUIRED TO RELOCATE HECO FACILITIES, INCLUDING TEMPORARY RELOCATION DONE FOR THE CONVENIENCE OF THE CONTRACTOR, SHALL BE DONE BY HECO AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND FOR COSTS IF APPLICABLE, UNLESS OTHERWISE NOTED.

8. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HECO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION, WITH ALL COSTS BEING BORNE BY THE CONTRACTOR.

9. ANY UNFORESEEN CONFLICT THAT WOULD RESULT IN THE REDESIGN OR RELOCATION (EITHER TEMPORARY OR PERMANENT) OF HECO'S ELECTRICAL FACILITIES MAY BE CAUSE FOR LENGTHY DELAYS. TO AVOID SUCH DELAYS, THE CONTRACTOR MUST NOTIFY HECO OF THE CONFLICT A MINIMUM OF 30 DAYS PRIOR TO THE START OF CONSTRUCTION.

10. ANY DAMAGE TO HECO'S FACILITIES WILL BE REPORTED IMMEDIATELY TO HECO'S TROUBLE DISPATCHER AT PH. 543-7874.

11. ALL HECO OVERHEAD AND UNDERGROUND FACILITIES SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION. COSTS FOR DAMAGES TO HECO FACILITIES SHALL BE BORNE BY THE CONTRACTOR. THIS REPAIR WORK SHALL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION.

12. THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HECO FROM AND AGAINST ALL LOSSES, DAMAGES CLAIMS AND ACTIONS, ALL EXPENSES INCIDENTAL TO SUCH LOSSES, DAMAGES, CLAIMS OR ACTION, BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTIONS OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY UPON THE SOLE NEGLIGENCE OF HECO.

Prepared by:

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91B
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET

INDEX OF DRAWINGS AND NOTES

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: _____

DRAWN BY: JLS	CHECKED: MTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO:	SCALE: AS NOTED	SHEET 2 OF _____ SHEETS	

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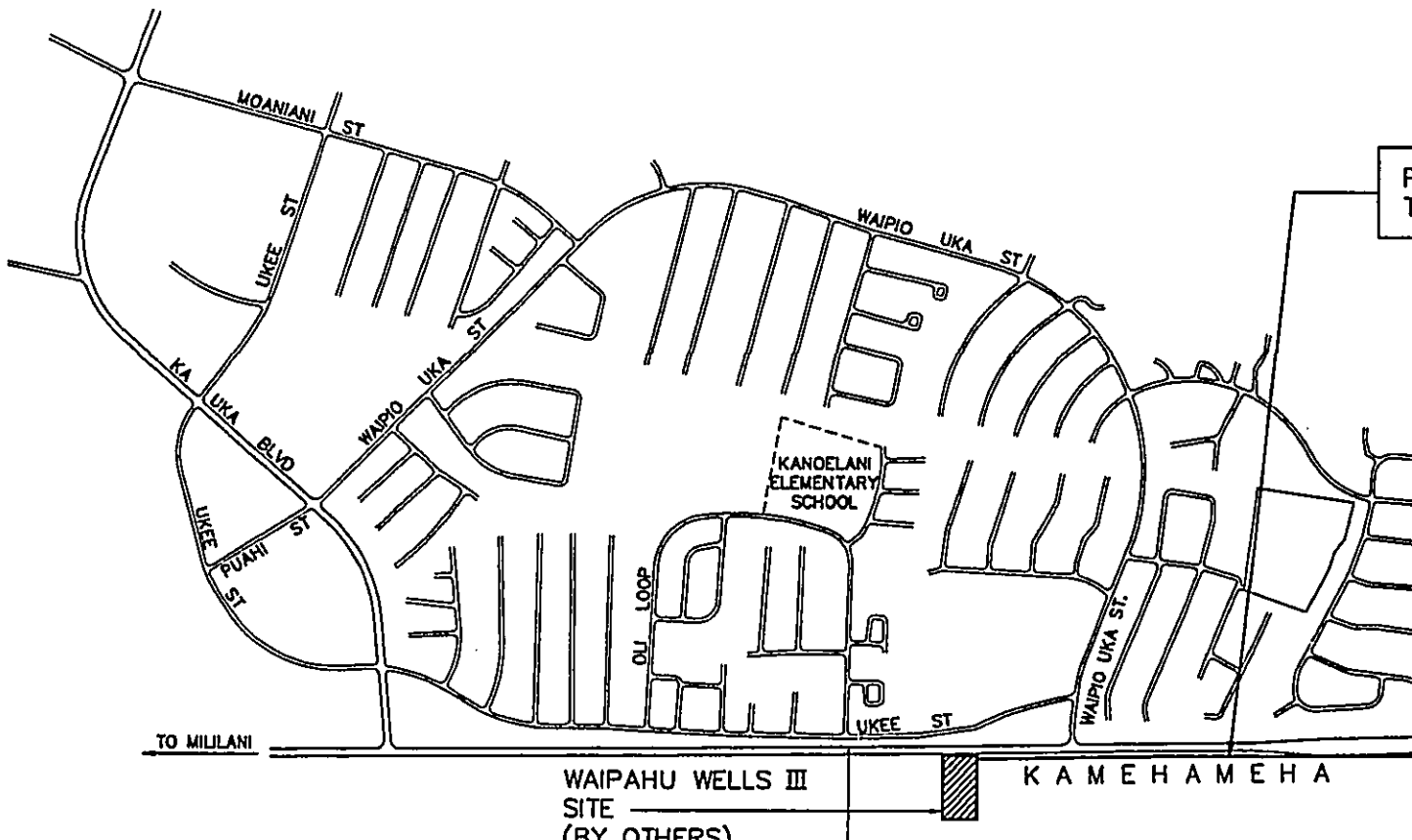


LEGEND

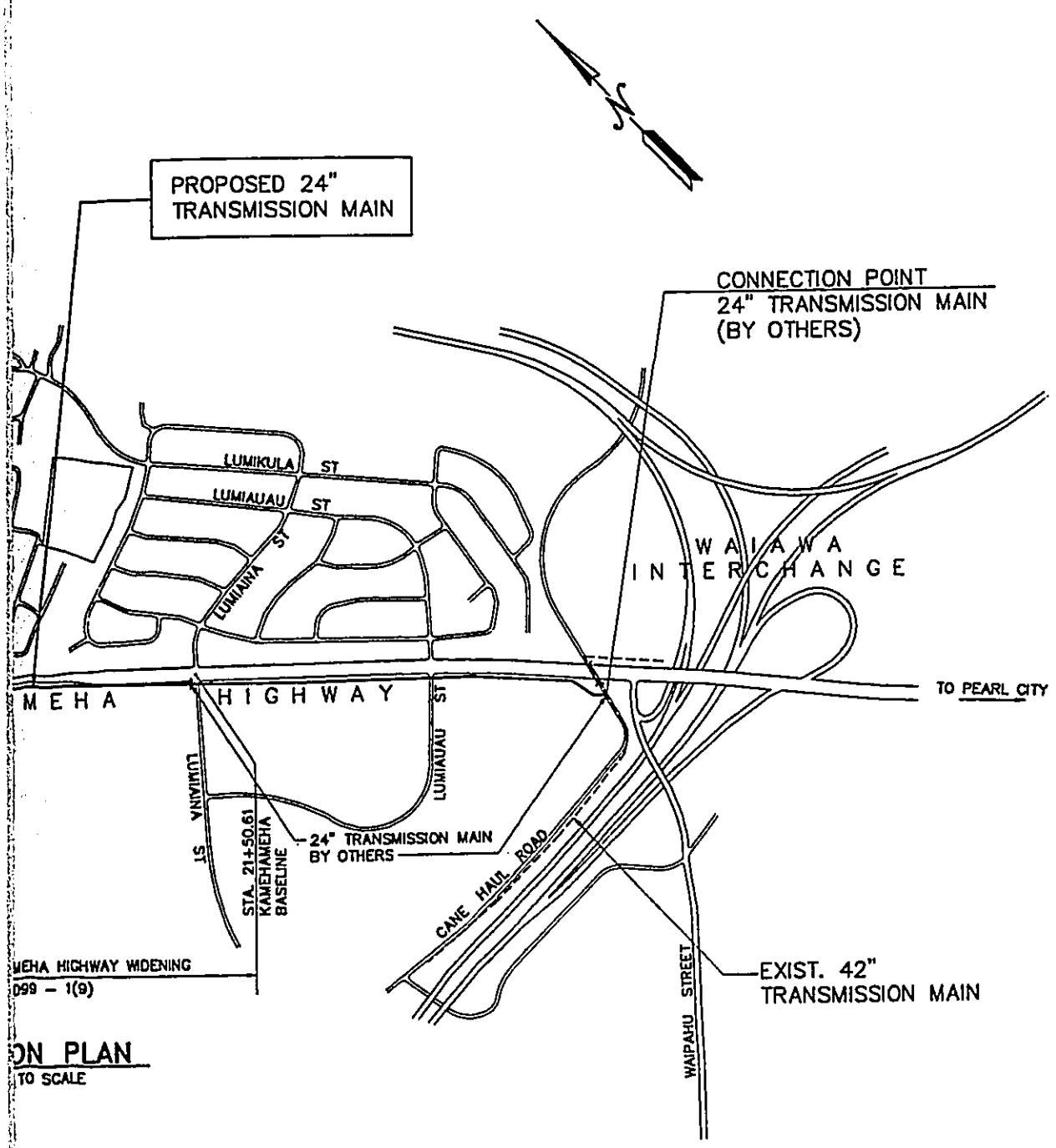
- NEW 24" TRANSMISSION MAIN — 7+00
- NEW 24" BGGV W/ MANHOLE
- NEW EDGE OF PAVEMENT
- STORM DRAIN 24" (BY OTHERS) — D24"
- STORM DRAIN INLET (BY OTHERS)
- SEWER LINE (BY OTHERS) — S18"
- SEWER MANHOLE (BY OTHERS)
- ELECTRICAL LINES (BY OTHERS) — ELEC
- WORK DONE BY OTHERS (CURBS, ETC.)
- STRIPING BY OTHERS
- KAMEHAMEHA HWY. BASELINE — 0+00
- EXISTING RIGHT-OF-WAY
- EXISTING EDGE OF PAVEMENT
- EXISTING CONTOURS — 306
- EXISTING TREES
- EXISTING WALLS

- EXISTING 84" STORM DRAIN — E/D84"
- EXISTING 36" STORM DRAIN — E/D36"
- EXISTING 24" STORM DRAIN — E/D24"
- EXISTING STORM DRAIN INLET
- EXISTING STORM DRAIN MANHOLE — SDMH
- EXISTING 12" SEWER — E/S12"
- EXISTING SEWER MANHOLE
- EXISTING ELECTRICAL LINES — E/ELEC
- EXISTING HECO BOX — HECO
- EXISTING TRAFFIC SIGNAL BOX — TSB
- EXISTING STREET LIGHT BOX — SLB
- EXISTING CATV BOX — CATV
- EXISTING STREET LIGHT
- EXISTING STREET LIGHT
- EXISTING POWER POLES — PP

- EXISTING GUY ANCHOR
- EXISTING 6" GAS — E/G6"
- EXISTING SIGNAL CABLE — E/SC
- EXISTING TELEPHONE POLES — TP
- EXISTING TELEPHONE BOX — TEL. BOX
- EXISTING TELEPHONE MANHOLE — HTCO MH
- EXISTING 12" WATER — E/W12"
- EXISTING 16" WATER — E/W16"
- EXISTING WATER MANHOLE — WMH
- ABANDONED 36" STORM DRAIN — E/D36" (ABAND

LOCATION PLAN

SCALE: NOT TO SCALE



ON PLAN
TO SCALE

E/G6"
E/SC
TP
TEL. BOX
OLE HTCO MH
E/W12"
E/W16"
WMH
RAIN E/D36" (ABAND.)

GRAPHIC SCALE:

500' 0 500' 1000' 1500'

SCALE: 1"=500'

Prepared by:

ASSOCIATES, INC.
Engineers/Architects

T-3

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91B
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET
LOCATION PLAN AND LEGEND

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO. | SCALE: AS NOTED | SHEET 3 OF _____ SHEETS

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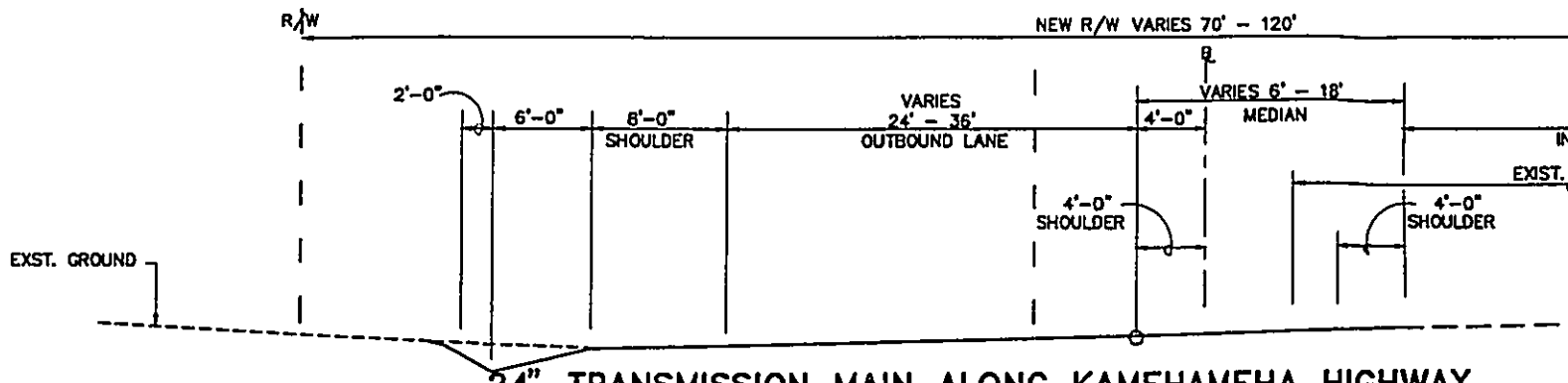
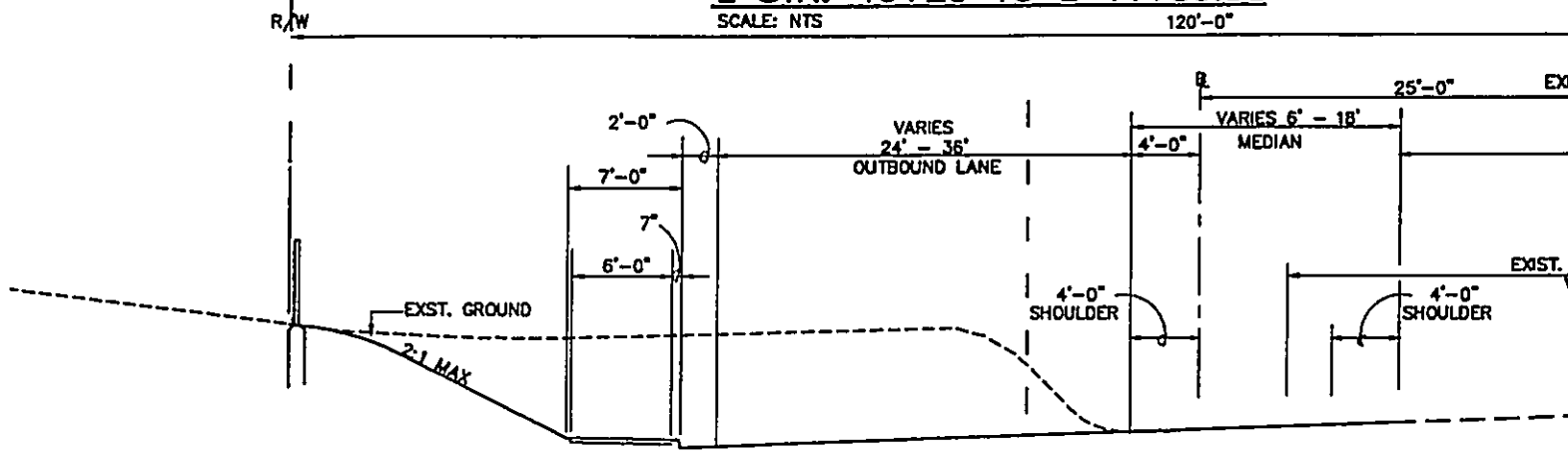


24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYP. RD. SECTION (PROJECT NO. NH-099-1(9))
℄ STA. 46+20 TO ℄ 44+30.58
SCALE: NTS



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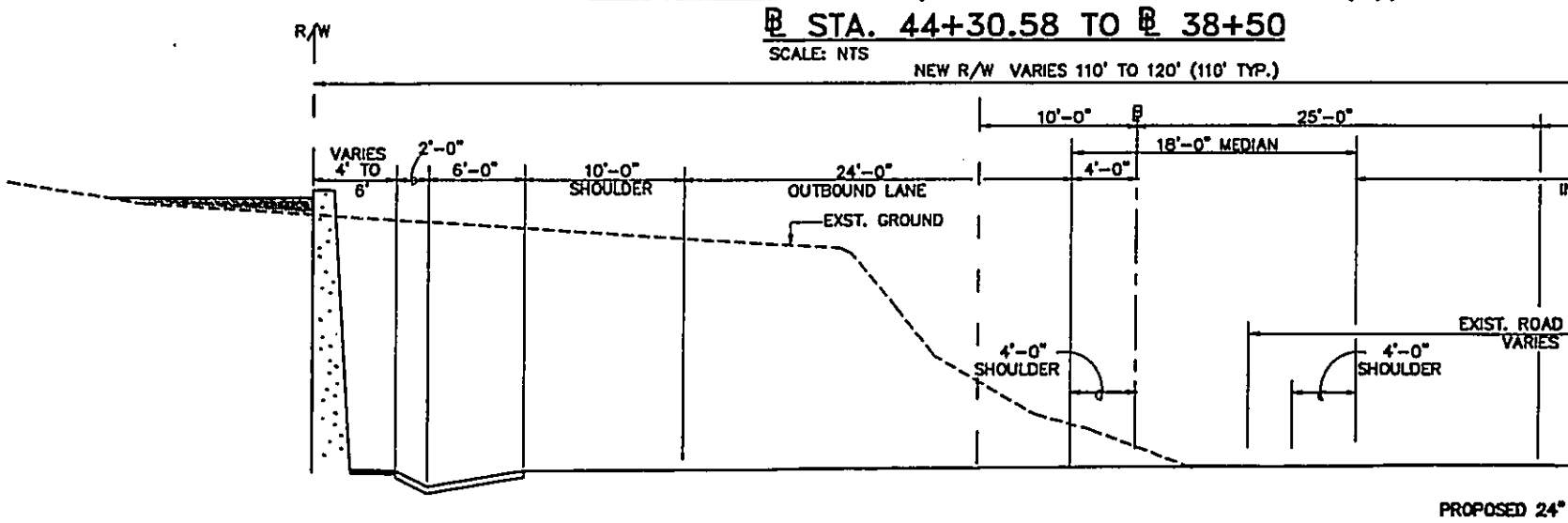

24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWA
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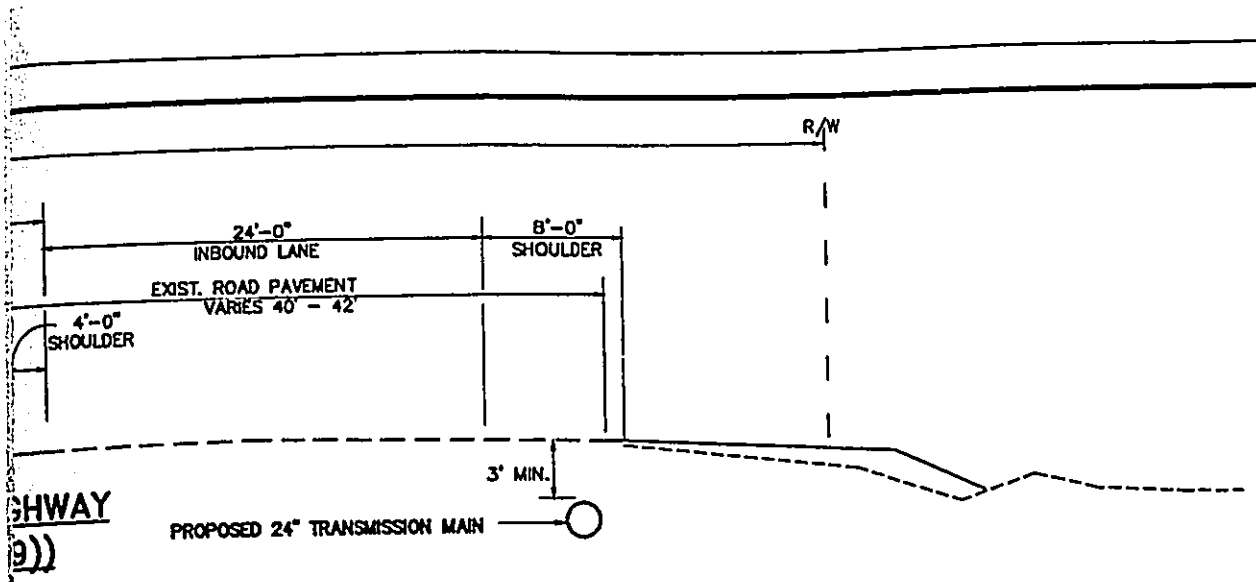
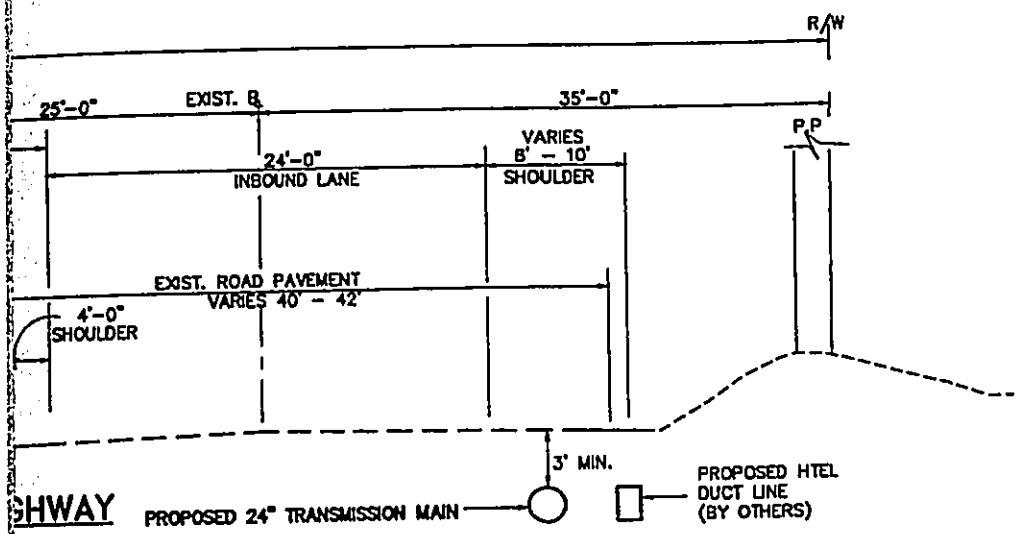
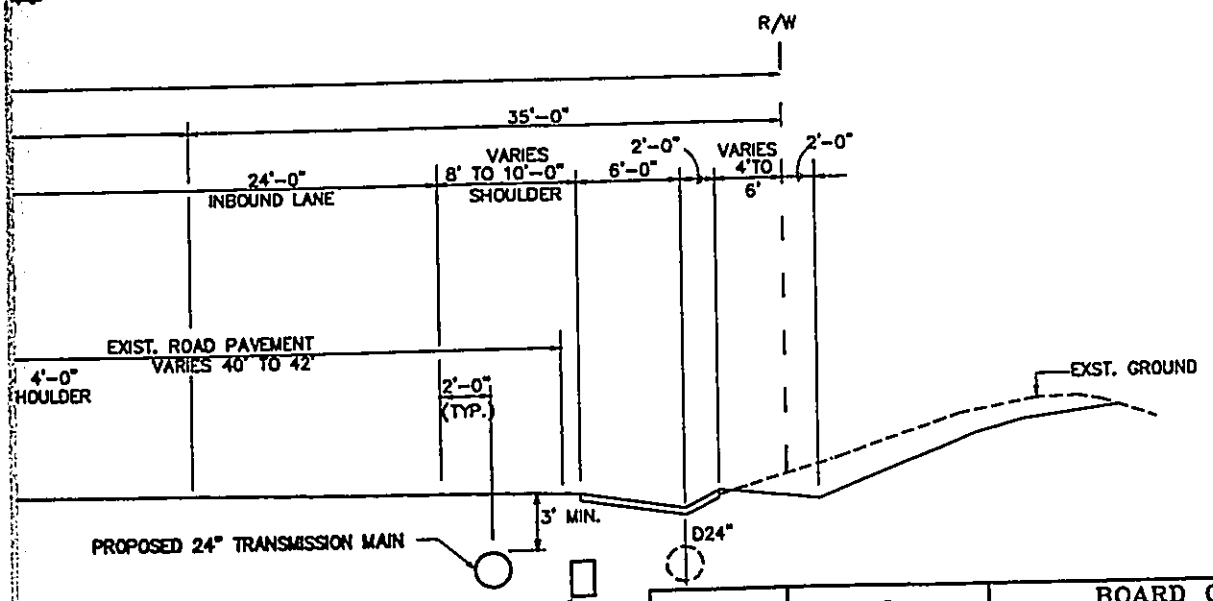
STA. 38+50 TO 32+30±
SCALE: NTS







EHA HIGHWAY
099-1(9))

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91B
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET
TYPICAL WATER SECTIONS - 1

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO.	SCALE: AS NOTED	SHEET 5 OF _____ SHEETS	

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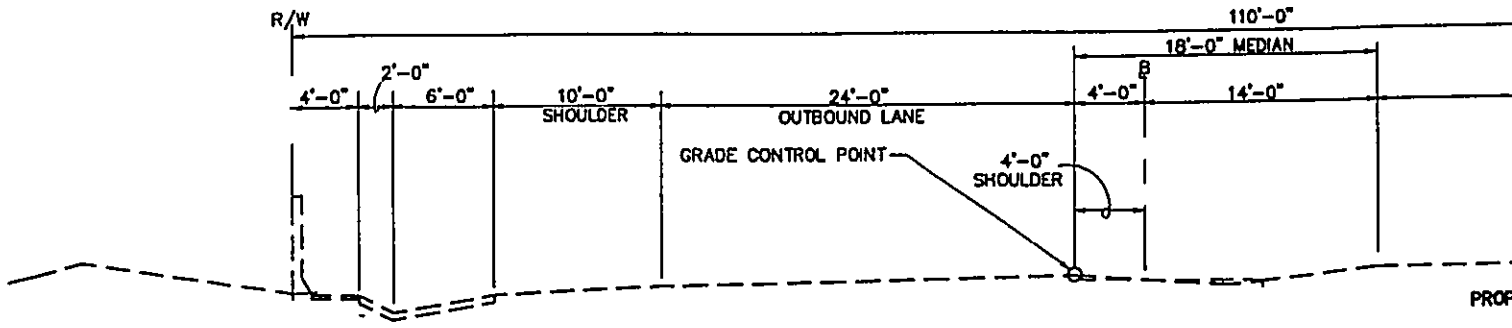
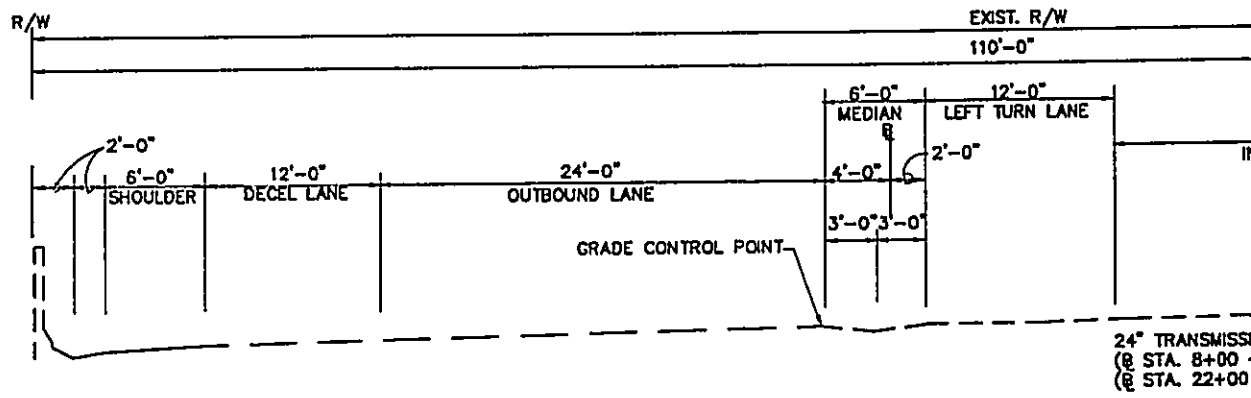


24" TRANSMISSION MAIN ALONG KAMEHAMEHA H

TYP. EXIST. RD. SECTION

STA. 32+30 TO 3+51.67

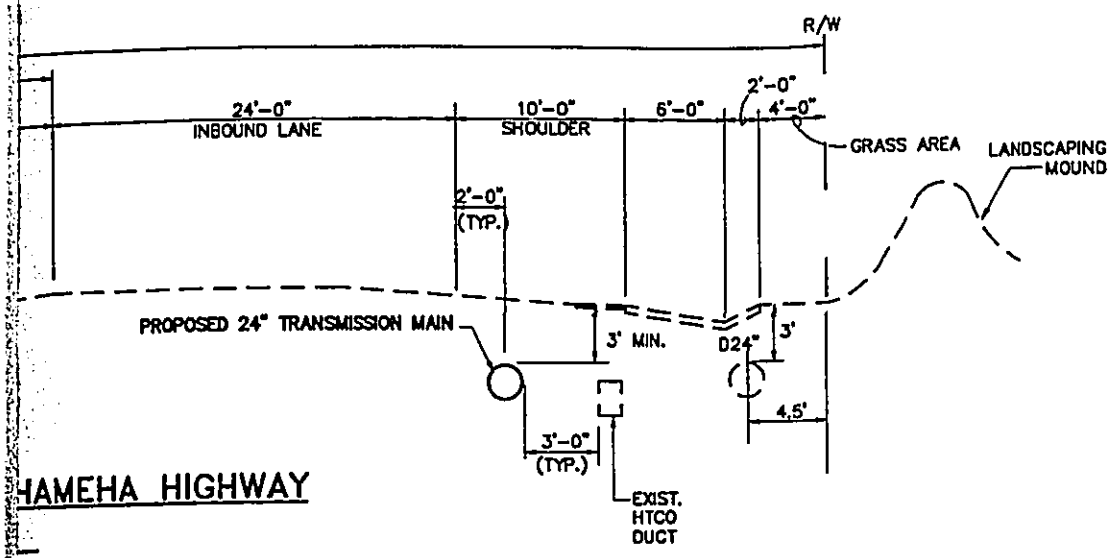
SCALE: NTS



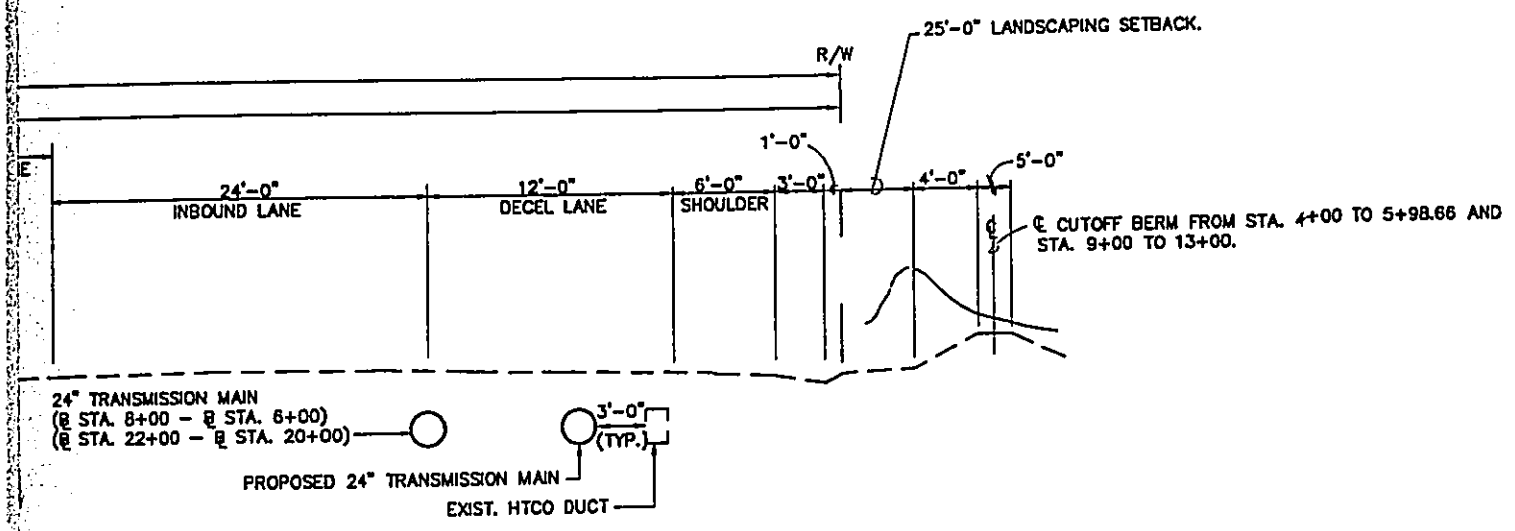
24" TRANSMISSION MAIN ALONG KAMEHAMEHA HI

TYPICAL EXIST. ROAD SECTION WITH DECELERATIO

SCALE: NTS



HAMEHA HIGHWAY



AMEHA HIGHWAY
CELERATION LANE

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C-2

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-918
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET
TYPICAL WATER SECTIONS – 2

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO.	SCALE: AS NOTED	SHEET 6 OF _____ SHEETS	

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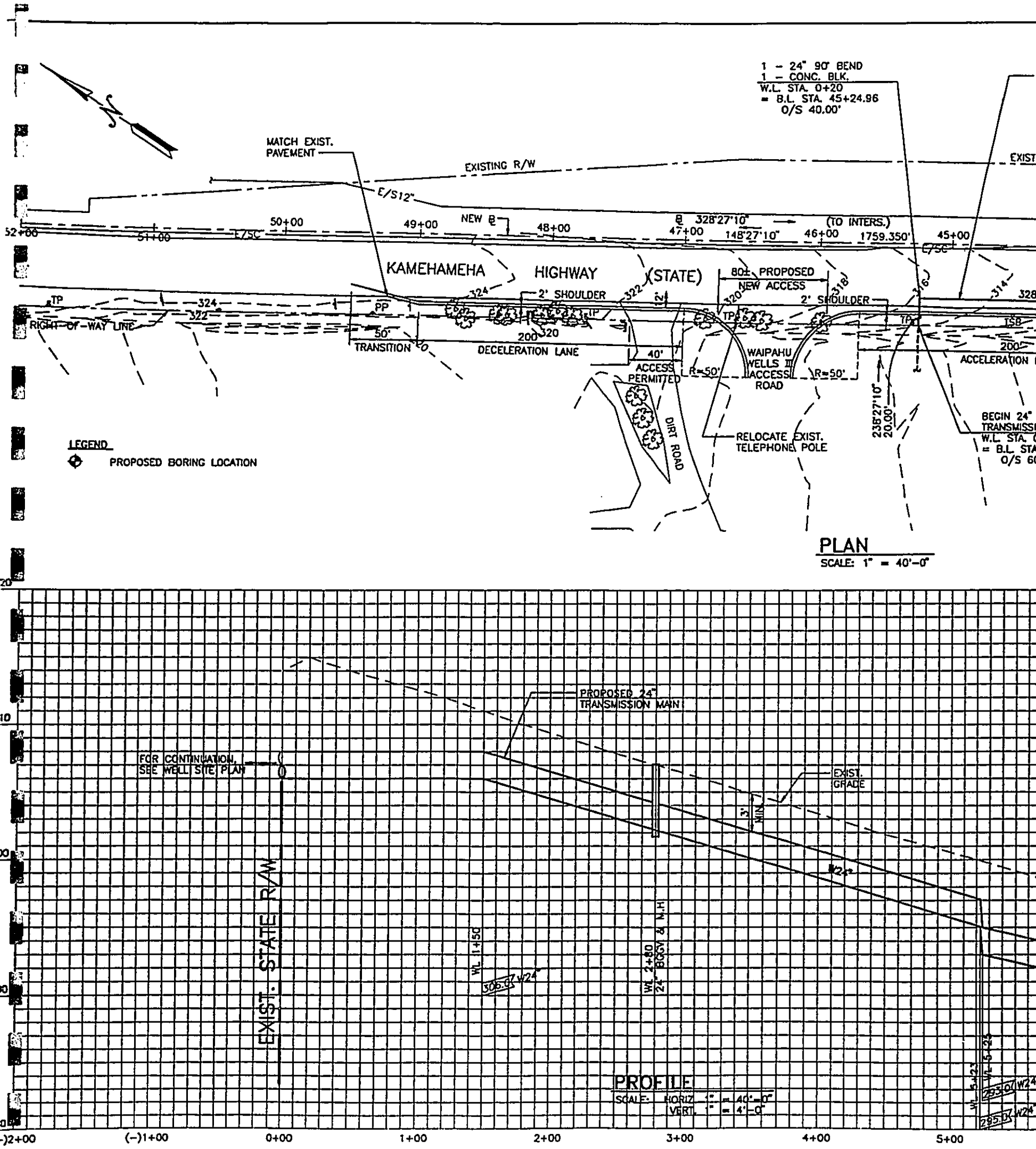
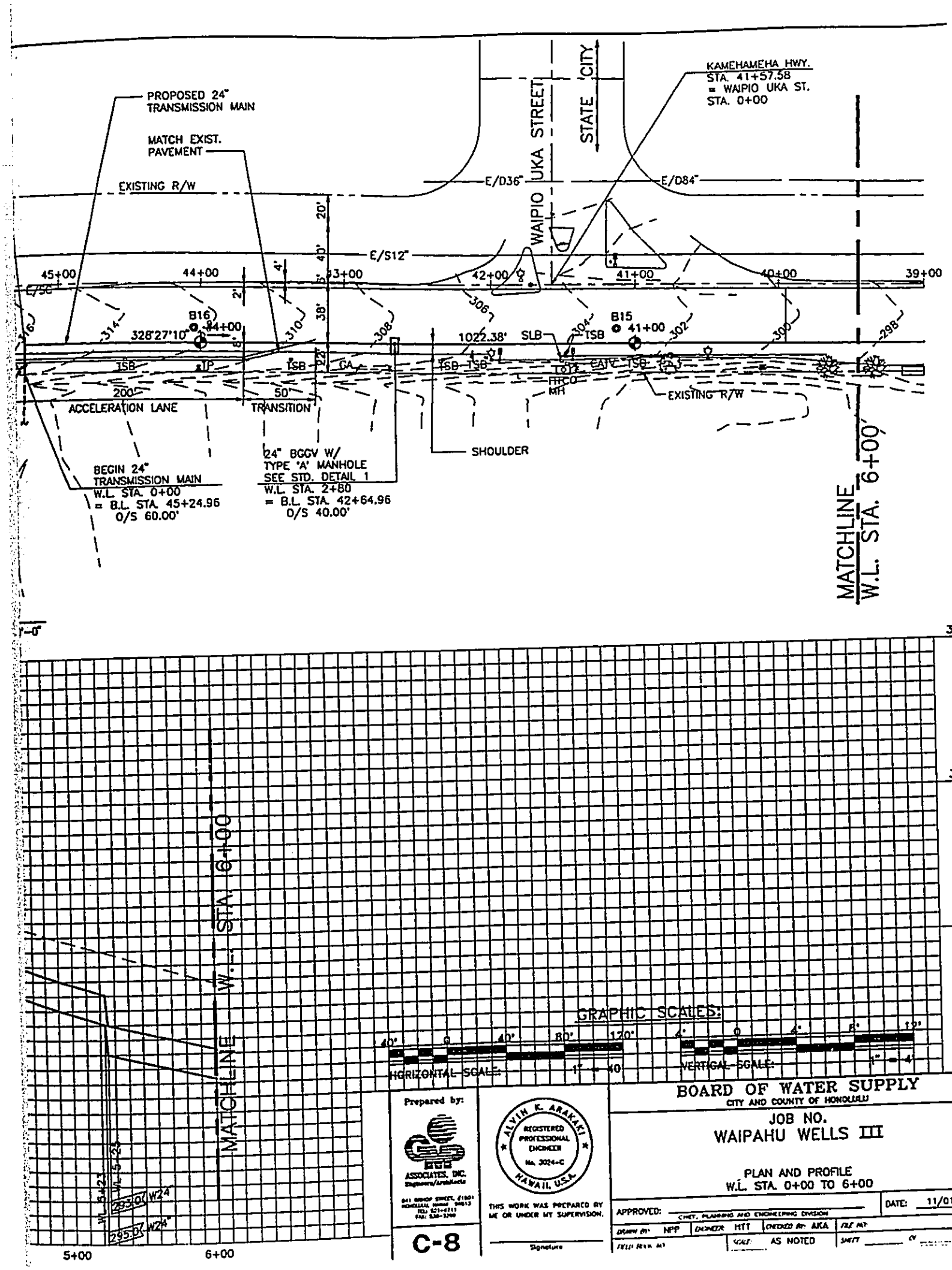

1 - 24" 90° BEND
1 - CONC. BLK.
W.L. STA. 0+20
= B.L. STA. 45+24.96
O/S 40.00'
MATCH EXIST. PAVEMENT
EXISTING R/W
E/S 12"
NEW ℄
℄ 328°27'10"
(TO INTERS.)
148°27'10"
1759.350'
E/SC
KAMEHAMEHA HIGHWAY (STATE)
80± PROPOSED NEW ACCESS
2' SHOULDER
RIGHT-OF-WAY LINE
50' TRANSITION
200' DECELERATION LANE
40' ACCESS PERMITTED
WAIPAHU WELLS II ACCESS ROAD
R=50'
DIRT ROAD
RELOCATE EXIST. TELEPHONE POLE
238°27'10" 20.00'
BEGIN 24" TRANSMISSION
W.L. STA.
= B.L. STA.
O/S 60
LEGEND
PROPOSED BORING LOCATION
PLAN
SCALE: 1" = 40'-0"
PROPOSED 24" TRANSMISSION MAIN
FOR CONTINUATION, SEE WELL SITE PLAN
EXIST. STATE R/W
EXIST. GRADE
3' MIN.
W24"
WL 1+50
306.0' W24"
WL 2+80
24" BGV & M.H.
WL 5+23'
295.0' W24"
PROFILE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"
20
10
0
-)2+00
(-)1+00
0+00
1+00
2+00
3+00
4+00
5+00



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ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

C-8

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO.
WAIPAHU WELLS III

PLAN AND PROFILE
W.L. STA. 0+00 TO 6+00

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION
DATE: 11/01/94

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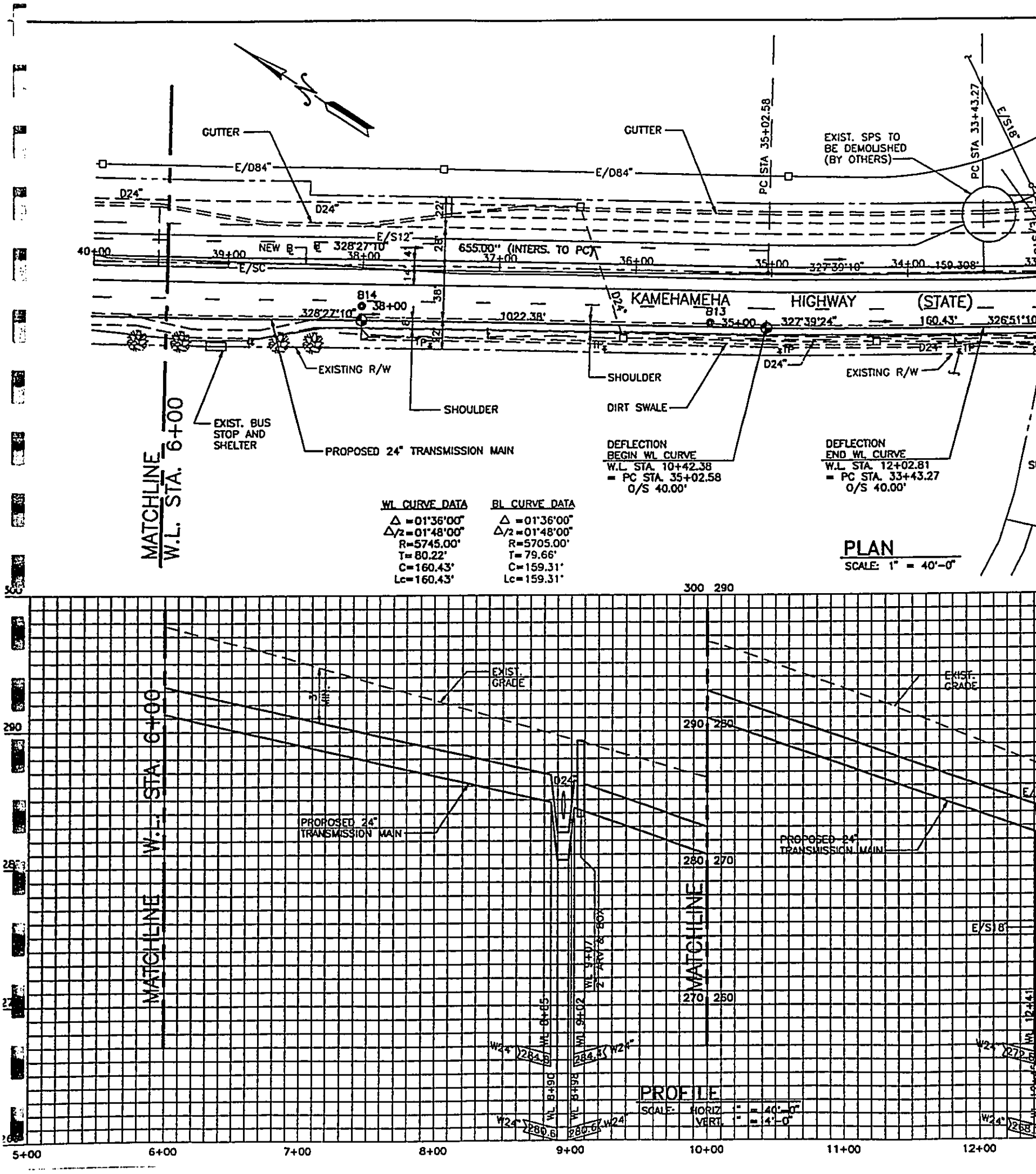
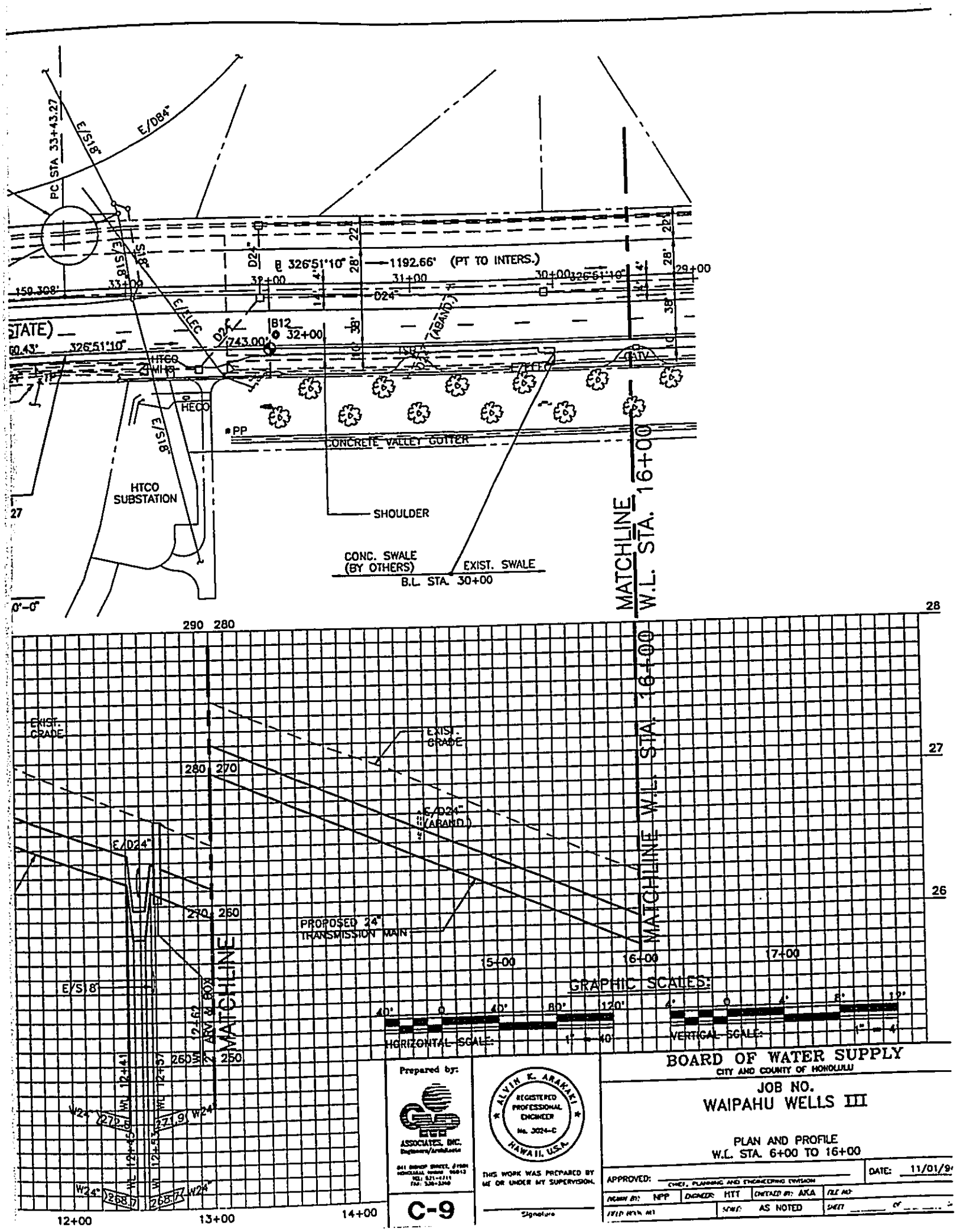

GUTTER
E/D84"
D24"
E/S12"
NEW ℄ 328°27'10"
E/SC
40+00
39+00
38+00
814
328°27'10"
655.00' (INTERS. TO PC)
37+00
36+00
35+00
327°39'10"
34+00
159.30'
KAMEHAMEHA HIGHWAY (STATE)
813
35+00
327°39'24"
160.43'
326°51'10"
1022.38'
PC STA 35+02.58
PC STA 33+43.27
EXIST. SPS TO BE DEMOLISHED (BY OTHERS)
E/S18"
22'
28'
38'
32'
14'
EXISTING R/W
SHOULDER
DIRT SWALE
EXIST. BUS STOP AND SHELTER
PROPOSED 24" TRANSMISSION MAIN
MATCHLINE W.L. STA. 6+00
DEFLECTION BEGIN WL CURVE
W.L. STA. 10+42.38
= PC STA. 35+02.58
O/S 40.00'
DEFLECTION END WL CURVE
W.L. STA. 12+02.81
= PC STA. 33+43.27
O/S 40.00'
WL CURVE DATA
Δ =01°36'00"
Δ/2=01°48'00"
R=5745.00'
T=80.22'
C=160.43'
Lc=160.43'
BL CURVE DATA
Δ =01°36'00"
Δ/2=01°48'00"
R=5705.00'
T=79.66'
C=159.31'
Lc=159.31'
PLAN
SCALE: 1" = 40'-0"
300 290
EXIST. GRADE
290 280
280 270
270 260
PROPOSED 24" TRANSMISSION MAIN
MATCHLINE
E/S 8"
WL 8+65
WL 8+90
WL 8+98
WL 9+02
WL 9+07
2-24" & 8" BOX
W24"
284.5
280.6
PROFILE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00



Prepared by:

GS ASSOCIATES, INC.

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C-9

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO.
WAIPAHU WELLS III

PLAN AND PROFILE
W.L. STA. 6+00 TO 16+00

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION

DATE: 11/01/9

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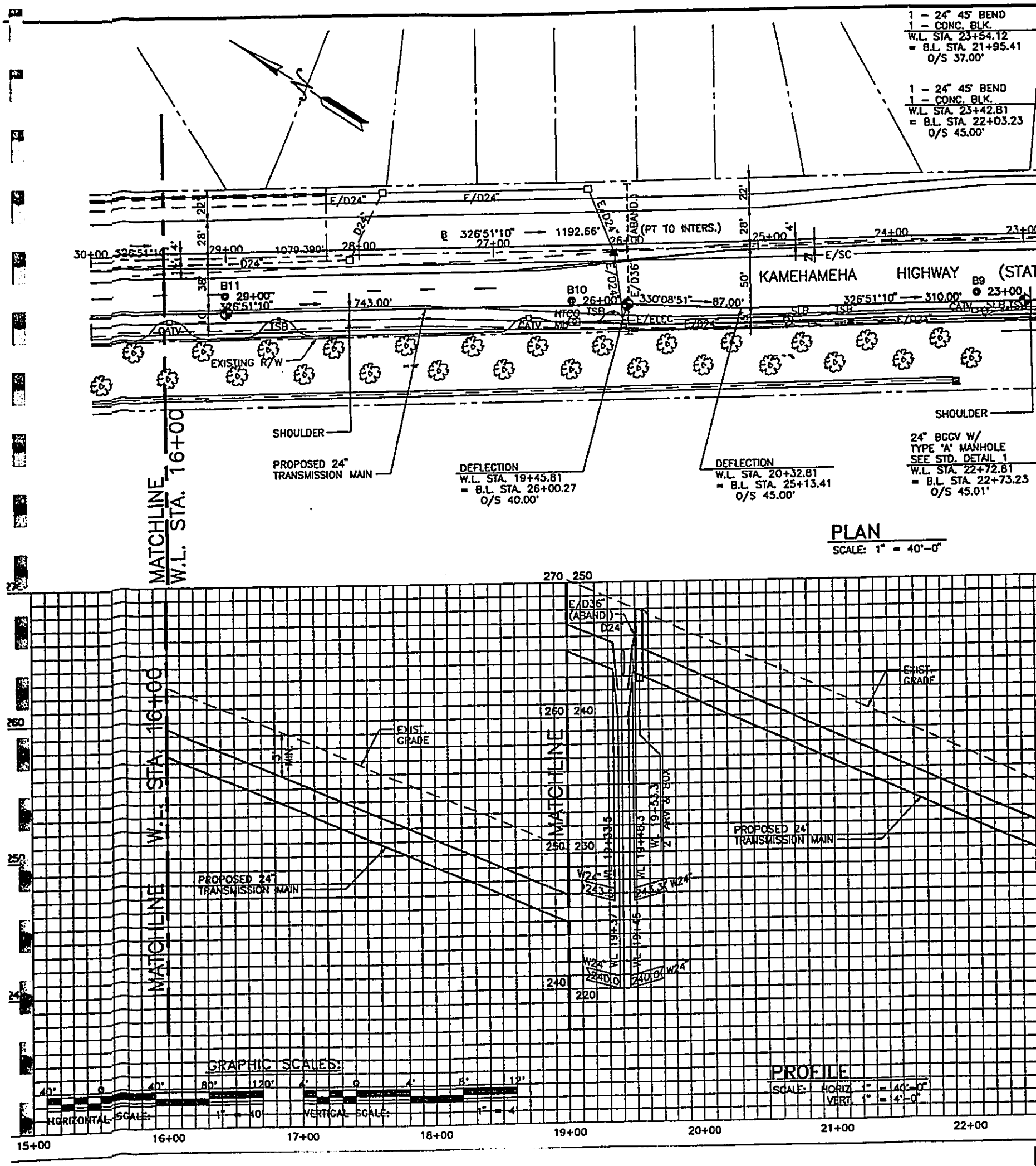
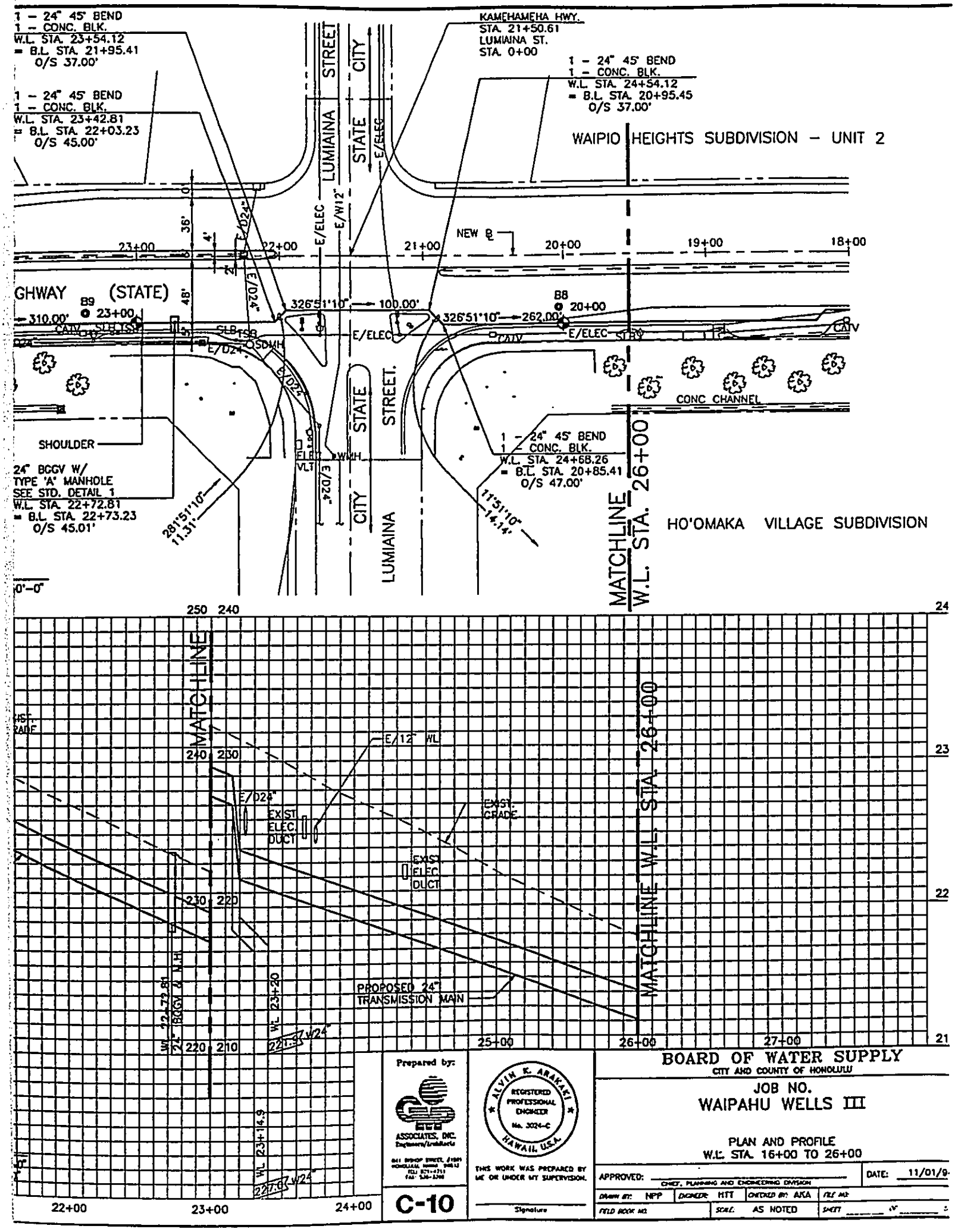

1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 23+54.12
= B.L. STA. 21+95.41
O/S 37.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 23+42.81
= B.L. STA. 22+03.23
O/S 45.00'
E/D24"
E/D24" (ABAND.)
B 326°51'10" 1192.66' (PT TO INTERS.)
30+00 326°51'10"
29+00
1079.39'
28+00
27+00
26+00
25+00
24+00
E/SC
KAMEHAMEHA HIGHWAY (STAT
B11
29+00
326°51'10"
743.00'
B10
26+00
330°08'51" 87.00'
B9
23+00
326°51'10" 310.00'
E/D36" (ABAND.)
E/D24"
CATV
TSB
HTCO
E/ELEC
SLB
EXISTING R/W
SHOULDER
PROPOSED 24" TRANSMISSION MAIN
DEFLECTION
W.L. STA. 19+45.81
= B.L. STA. 26+00.27
O/S 40.00'
DEFLECTION
W.L. STA. 20+32.81
= B.L. STA. 25+13.41
O/S 45.00'
24" BGGV W/
TYPE 'A' MANHOLE
SEE STD. DETAIL 1
W.L. STA. 22+72.81
= B.L. STA. 22+73.23
O/S 45.01'
MATCHLINE W.L. STA. 16+00
B.L. STA. 16+00
PLAN
SCALE: 1" = 40'-0"
270 250
260 240
250 230
240 220
EXIST. GRADE
PROPOSED 24" TRANSMISSION MAIN
W24"
WL 19+45
WL 19+83
WL 19+53.3
WL 19+33.5
2" AWV & BOX
GRAPHIC SCALES:
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'
PROFILE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00



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C-10

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO.
WAIPAHU WELLS III

PLAN AND PROFILE
W.L. STA. 16+00 TO 26+00

APPROVED: _____ DATE: 11/01/9-
CHIEF, PLANNING AND ENGINEERING DIVISION

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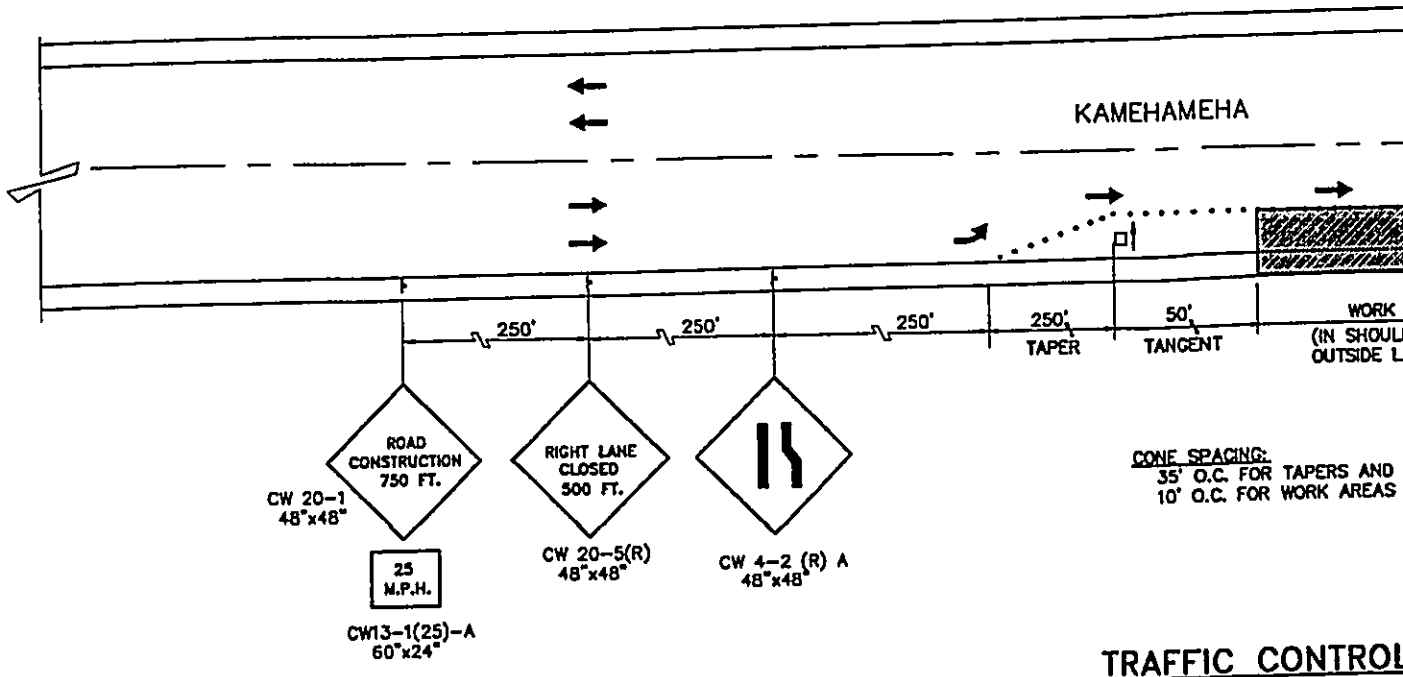


TRAFFIC CONTROL

SCALE: 1"=40'-0"

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A CONSTRUCTION PERMIT FROM THE STATE'S HIGHWAY DISTRICT ENGINEER AT 727 KAKOI STREET PRIOR TO COMMENCEMENT OF WORK WITHIN STATE HIGHWAY RIGHT-OF-WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN STATE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. ALL LANES SHALL BE OPENED TO TRAFFIC DURING THE MORNING PEAK HOURS FROM 5:00 A.M. TO 8:30 A.M. AND DURING THE AFTERNOON PEAK HOURS FROM 3:00 P.M. TO 6:00 P.M., AND DURING OFF-WORK HOURS. DURING WORKING HOURS ONLY ONE LANE OF KAMEHAMEHA HIGHWAY SHALL BE CLOSED AT ANY ONE TIME.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI- TRAFFIC CONTROL FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS" IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION. A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.

5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:
   4" ASPHALT CONCRETE, 8" ASPHALT CONCRETE BASE AND 12" AGGREGATE SUBBASE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.

6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATIONS OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

   A. SUBBASE: AT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.

   B. BASE COURSE: AT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.

   C. ASPHALT CONCRETE PAVEMENTAT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.

8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE NEW CENTERLINE OF UTILITY TRENCH AND THAT SUCH INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

9. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADEQUATE, SAFE, NON-SKID BRIDGING MATERIAL OVER THE TRENCH, INCLUDING SHORING, WHEN TRENCHING IN PAVEMENT AREAS TO HANDLE ALL TYPES OF VEHICULAR TRAFFIC.

10. NO TRENCH SHALL BE OPENED MORE THAN 100 FEET IN ADVANCE OF THE INSTALLED AND TESTED PIPE.

11. LONGITUDINAL DRAINGE ALONG THE HIGHWAY SHALL BE

12. PAVEMENT STRIPING SHALL BE DONE BY CONTRACTOR.

13. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE THEREOF FROM THE DATE OF NOTIFICATION OF APPROV EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THI APPLICANT WILL BE REQUIRED TO RESUBMIT HIS CONST REVIEW AND APPROVAL.

14. ALL REGULATORY, GUIDE AND CONSTRUCTION SIGNS AN INTENSITY REFLECTIVE SHEETING.

15. CONTRACTOR SHALL INFORM THE STATE PERMIT OFFICE DAYS PRIOR TO CLOSING ANY LANES.

16. DRIVEWAY SHALL BE KEPT OPEN UNLESS THE OWNERS RIGHTS-OF-WAYS ARE OTHERWISE PROVIDED FOR SATIS

17. WHERE PEDESTRIAN WALKWAYS EXIST. THEY SHALL BE OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PRO BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE

18. THE CONTRACTOR SHALL REFERENCE TO THE SATISFAC EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKI OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE REPAIR ALL TRAFFIC SIGNS, POSTS AND PAVEMENT MA UNLESS DIRECTED OTHERWISE BY THE DISTRICT ENGINEE

19. THE CONTRACTOR SHALL EXERCISE CARE WHEN EXCAV EXISTING FACILITIES SHALL BE IMMEDIATELY REPORTED CITY OR STATE AGENCY. THE REPAIR WORK SHALL BE

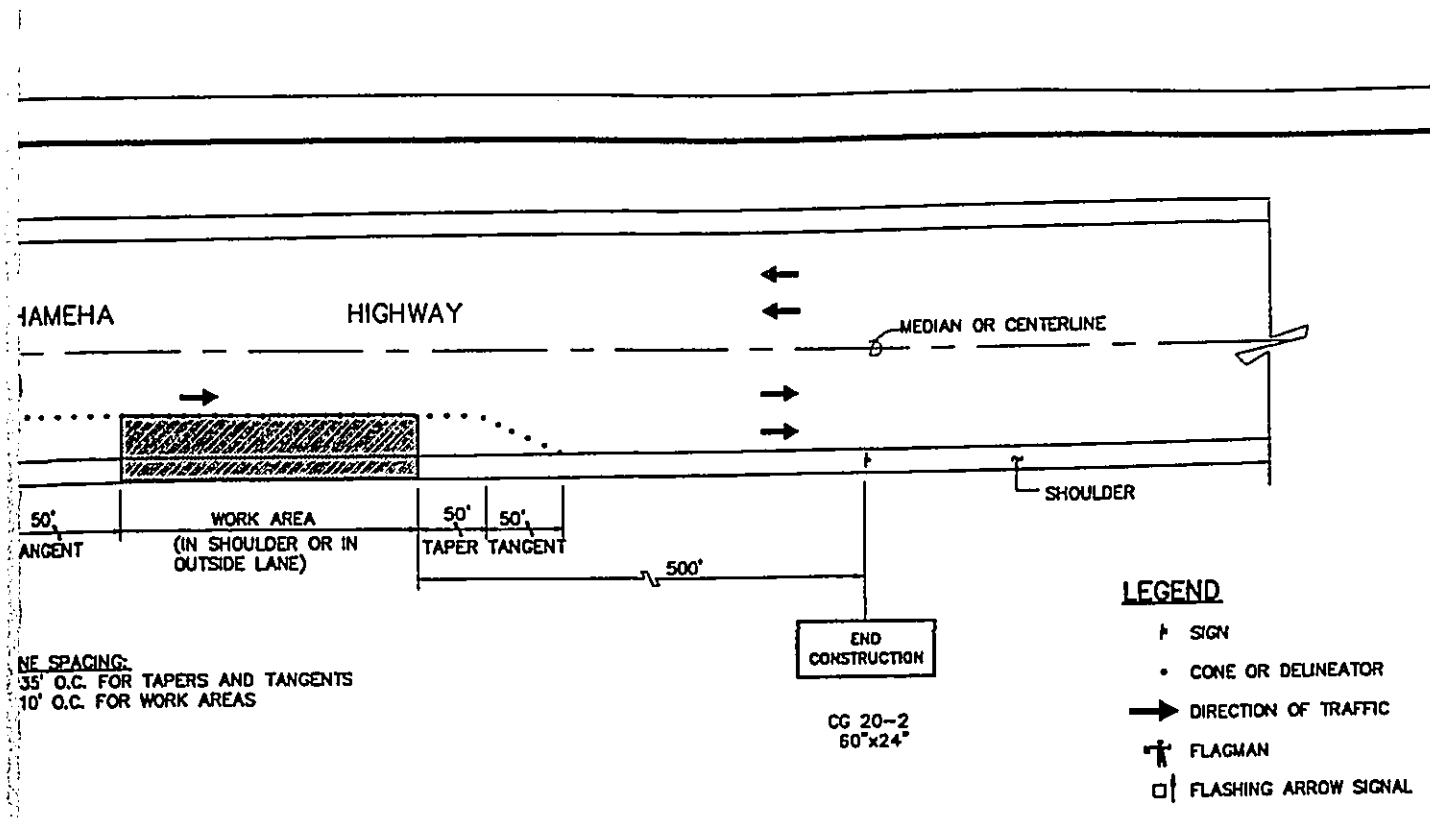
20. THE CONTRACTOR SHALL NOTIFY THE HIGHWAY LIGHTIN SDOT, THREE (3) WORKING DAYS PRIOR TO COMMENCIN

GENERAL NOTES FOR TRAFFIC CONTROL

1. THE PERMITEE SHALL MAKE MINOR ADJUSTMENTS AT I STRUCTURES, ETC., TO FIT FIELD CONDITIONS.

2. CONES OR DELINEATORS SHALL BE EXTENDED TO A PO APPROACHING TRAFFIC.

3. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SUCH FROM THE WORK AREA SHALL BE PLACED FIRST. THE PROGRESSIVELY TOWARD THE WORK AREA.



NE SPACING:
35' O.C. FOR TAPERS AND TANGENTS
10' O.C. FOR WORK AREAS

FFIC CONTROL PLAN

1"=40'-0"

G THE HIGHWAY SHALL BE MAINTAINED.

E DONE BY CONTRACTOR.

TRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE YEAR
NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE
NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE
D TO RESUBMIT HIS CONSTRUCTION PLANS FOR DIVISION'S

CONSTRUCTION SIGNS AND BARRICADES SHALL BE OF HIGH
ING.

THE STATE PERMIT OFFICE (831-6712) AT LEAST TWO (2)
Y LANES.

PEN UNLESS THE OWNERS OF THE PROPERTY USING THESE
RWISE PROVIDED FOR SATISFACTORILY.

YS EXIST. THEY SHALL BE MAINTAINED IN PASSABLE CONDITION
EDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS
RSECTIONS SHALL LIKEWISE BE PROVIDED.

ERENCE TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL
STS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT
NTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS,
POSTS AND PAVEMENT MARKINGS DISTRIBUTED BY HIS ACTIVITIES,
BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

ERCISE CARE WHEN EXCAVATING IN THIS AREA. DAMAGES TO THE
E IMMEDIATELY REPORTED TO THE RESPECTIVE UTILITY COMPANIES,
REPAIR WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.

TIFY THE HIGHWAY LIGHTING AND TRAFFIC SIGNAL SUPERVISOR,
AYS PRIOR TO COMMENCING WORK IN THIS AREA (834-4581).

TRAFFIC CONTROL PLAN

MINOR ADJUSTMENTS AT INTERSECTIONS, DRIVEWAYS, BRIDGES,
IELD CONDITIONS.

LL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO

HALL BE INSTALLED SUCH THAT THE SIGN OR DEVICE FARTHEST
L BE PLACED FIRST. THE OTHERS SHALL THEN BE PLACED
WORK AREA.

4. REGULATORY AND WARNING SIGNS WITHIN THE CONSTRUCTION ZONE THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED. ALL SIGNS SHALL BE RESTORED UPON COMPLETION OF THE WORK.
5. FLAGGERS AND /OR POLICE OFFICERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
6. WHEN REQUIRED BY THE ISSUING OFFICE, THE PERMITTEE SHALL INSTALL A FLASHING ARROW SIGNAL OR CHANGEABLE MESSAGE BOARD AS SHOWN ON THE TRAFFIC CONTROL PLANS, OR AS DIRECTED BY THE STATE INSPECTOR/ENGINEER.
7. THE CONTRACTOR SHALL NOTIFY THE OAHU TRANSIT SERVICES INC. (OTS), ED SNIFFEN, AT 848-4571 OR LOWELL TOM AT 848-4578 TWO WEEKS PRIOR TO BEGINNING ANY WORK, INFORMING THEM OF LOCATION, SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUS STOP.
8. ALL TRAFFIC LANES SHALL BE A MINIMUM OF 10 FEET WIDE.
9. ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE.
10. THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PERCLUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (i.e., WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
11. AT END OF EACH DAY'S WORK OR AS SOON AS THE WORK IS COMPLETED, THE PERMITTED SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC. REMOVAL SHALL BE IN THE REVERSE ORDER OF INSTALLATION.
12. REPLACE PERMANENT PAVEMENT MARKINGS AND TRAFFIC SIGNS UPON COMPLETION OF EACH PHASE WORK TO THE SATISFACTION OF THE STATE INSPECTOR/ENGINEER.

GRAPHIC SCALE:

40' 0 40' 80' 120'

SCALE: 1"=40'

Prepared by:

ASSOCIATES, INC.
Engineers/Architects

C-6

ALVIN K. ARAKAKI
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No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91B

KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET

TRAFFIC CONTROL PLAN & NOTES

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: _____

DRAWN BY: BS	ENGINEER: HTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO:	SCALE: AS NOTED	SHEET 13 OF _____ SHEETS	

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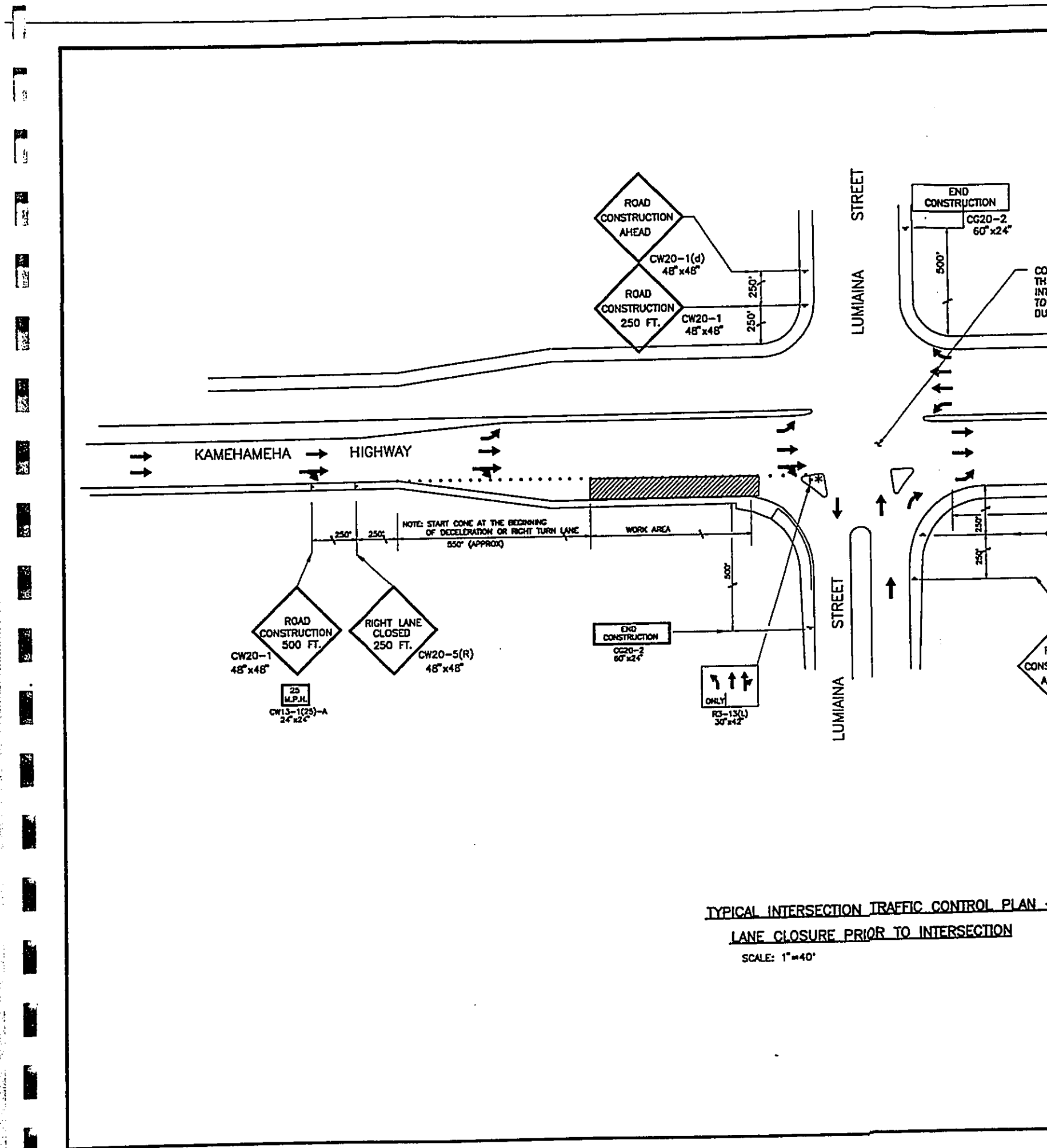
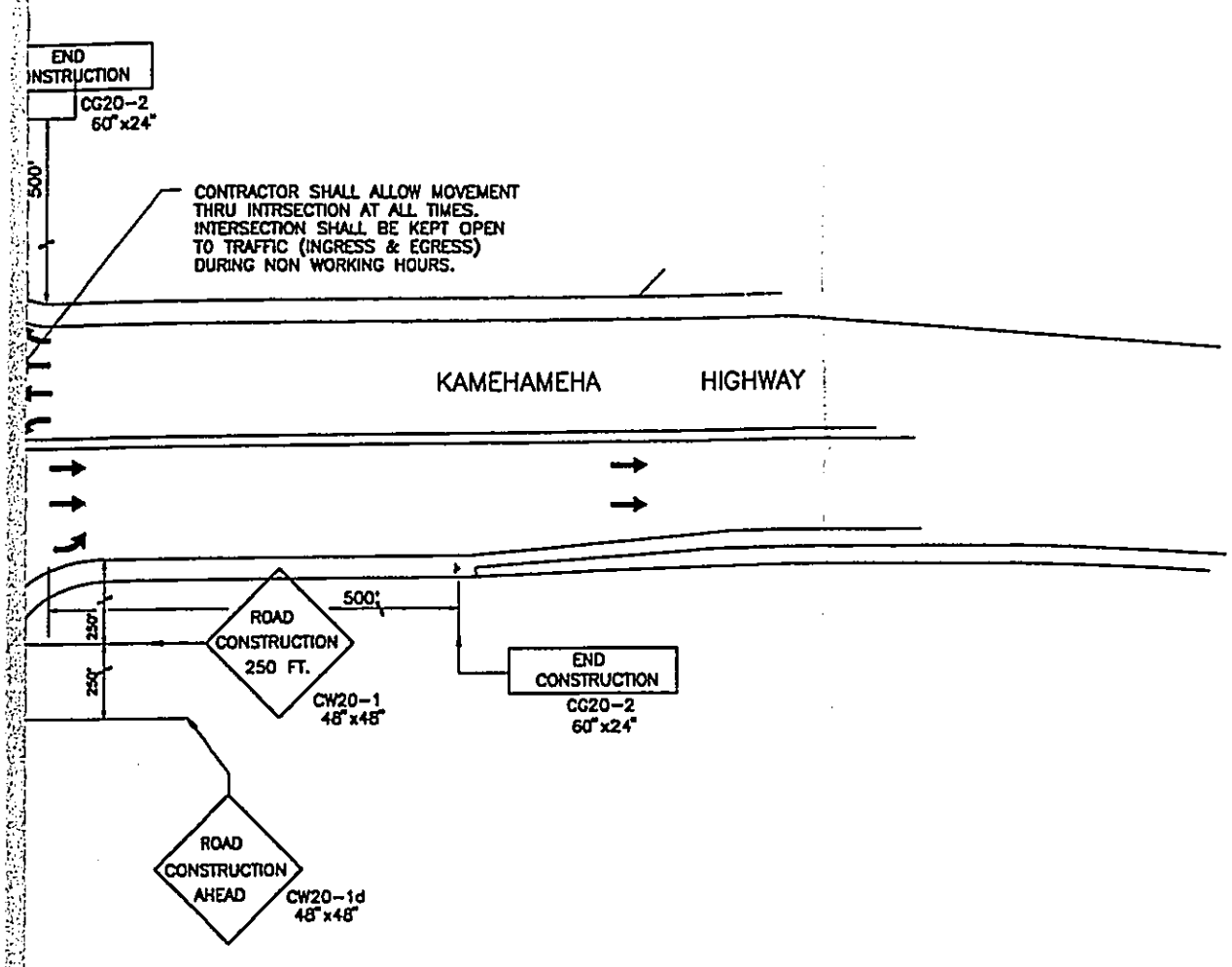


TYPICAL INTERSECTION TRAFFIC CONTROL PLAN

LANE CLOSURE PRIOR TO INTERSECTION

SCALE: 1"=40'



ONTROL PLAN –
ERSECTION

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGMAN
- FLASHING ARROW SIGNAL
- * POLICE OFFICER TO MONITOR FLOW

Prepared by:

ASSOCIATES, INC.
Engineers/Architects

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HAWAII, U.S.A.

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Signature

C-7

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91B
KAMEHEMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO LUMIAINA STREET
TRAFFIC CONTROL PLAN –2

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: _____

DRAWN BY: BS	ENGINEER: MTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO.	SCALE: AS NOTED	SHEET 14 OF _____ SHEETS	

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JOB NO. 95 -

KAMEHAMEHA HIGHWAY : 24 IN

FROM: LUMIAINA STREET TO W

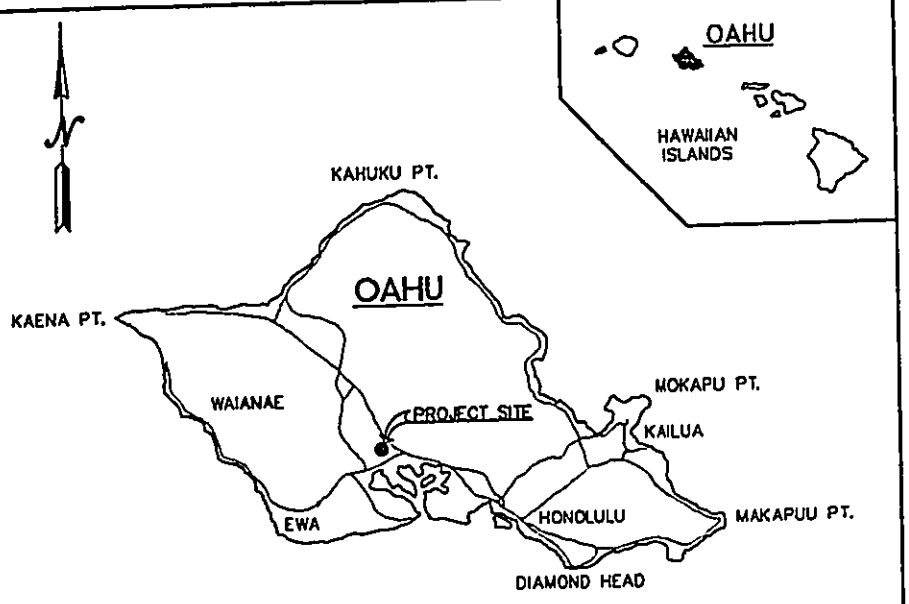
BOARD OF WATE
CITY AND COUNTY O
HONOLULU, H

PREPARED BY:

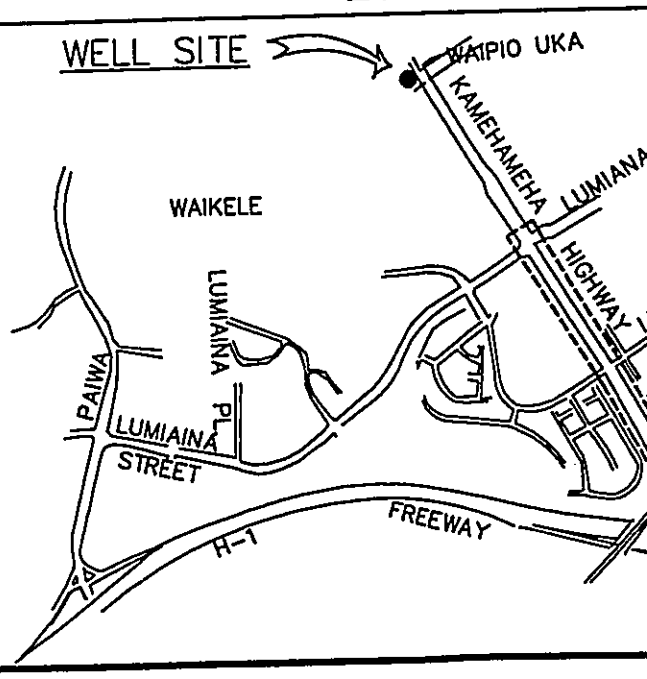
GMP ASSOCIAT

ENGINEERS/ARCHITE
HONOLULU, HAWA

VICINITY MAP



LOCATION MAP



). 95 - 91C

24 INCH TRANSMISSION MAIN

T TO WAIAWA INTERCHANGE

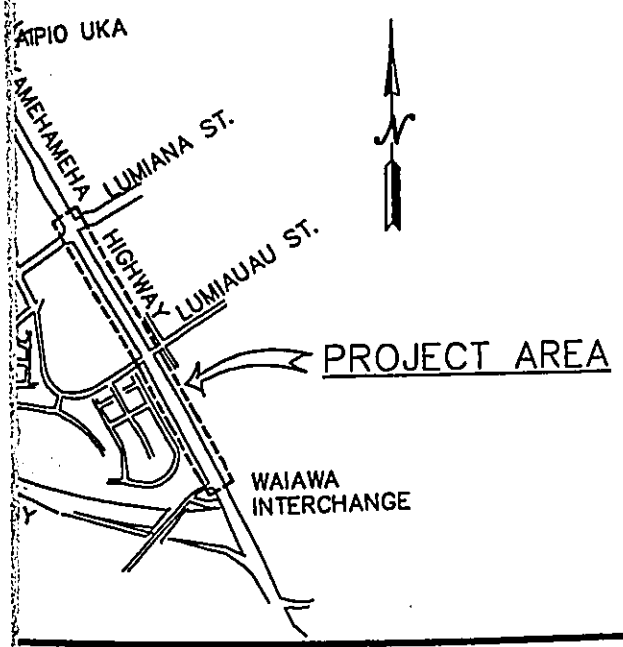
WATER SUPPLY
ITY OF HONOLULU
JLU, HAWAII

PARED BY:

OCIATES, INC.

S/ARCHITECTS
ULU, HAWAII

TION MAP



APPROVED

MANAGER AND CHIEF OF ENGINEERING
BOARD OF WATER SUPPLY

DATE

CHIEF, HIGHWAYS DIVISION
STATE DEPARTMENT OF TRANSPORTATION
(APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY ID NO. , LETTER OF APPROVAL NO. HWY-CM , DATED .)

DATE

TITLE-P1 02/06/95 10:16 100%

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
		TITLE
1	T-1	TITLE SHEET, LOCATION MAP AND VICINITY MAP
2	T-2	INDEX OF DRAWINGS AND WATER NOTES
3	T-3	LOCATION PLAN AND LEGEND
		CIVIL
4	C-1	TYPICAL WATER SECTIONS - 1
5	C-2	PLAN AND PROFILE - STA. 23+00 TO 33+00
6	C-3	PLAN AND PROFILE - STA. 33+00 TO 43+00
7	C-4	PLAN AND PROFILE - STA. 43+00 TO (-)7+00
8	C-5	TRAFFIC CONTROL PLAN AND NOTES
9	C-6	TRAFFIC CONTROL PLAN - 2
10	C-7	TRAFFIC CONTROL PLAN - 3
11	C-8	TRAFFIC CONTROL PLAN - 4
12	C-9	DETOUR PLAN
13	C-10	TRAFFIC SIGNAL LOOP PLAN AT LUMIAINA STREET
14	C-11	TRAFFIC SIGNAL LOOP PLAN AT LUMIAUAU STREET
15	C-12	PRESSURE REDUCING/SUSTAINING VALVE VAULT
16	S-1	STRUCTURAL NOTES AND DETAILS
17	S-2	FOUNDATION PLAN, TOP PLAN AND SECTIONS FOR PRESSURE REDUCING/SUSTAINING VALVE VAULT

HTCO NOTES:

1. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELEPHONE COMPANY (HTCO) AT 483-8085 TWO WEEKS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING TELEPHONE CABLES AND/OR DUCT LINES.
2. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND TELEPHONE CABLES IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE.
3. ALL EXCAVATION WITHIN TWO FEET OF TELEPHONE CABLES SHALL BE DONE BY HAND.
4. FOR RELOCATION OF ANY TELEPHONE CABLES AND/OR DUCT LINES, THE CONTRACTOR SHALL NOTIFY HTCO THIRTY (30) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, ARRANGE FOR TRAFFIC PERMITS AND RESTORE SIDEWALK, PAVEMENT OR OTHER FACILITIES.
5. THE CONTRACTOR SHALL NOTIFY HTCO IMMEDIATELY AT 611 AFTER ANY DAMAGES TO HTCO CABLES, DUCT LINES, PULLBOXES, MANHOLES, HANDHOLES, POLES AND GUYS. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL DAMAGES TO HTCO FACILITIES.
6. REPAIR WORK ON DAMAGED CABLES SHALL BE DONE BY HTCO AND ANY OTHER WORK INVOLVING EXISTING UNDERGROUND FACILITIES SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE. COST FOR ALL REPAIR WORK SHALL BE BORNE BY THE CONTRACTOR.
7. PROVIDE ADEQUATE SUPPORT AND PROTECTION FOR TELEPHONE CABLES AND/OR DUCT LINES EXPOSED IN THE TRENCH. SUCH SUPPORT AND PROTECTION SHALL BE APPROVED BY HTCO INSPECTOR.
8. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT CLEARANCE FROM HTCO RECORDS SECTION LOCATED AT 3239 UALENA STREET, 3RD FLOOR (ABY-3) TWO WEEKS PRIOR TO START OF CONSTRUCTION. HOURS OF BUSINESS IS 7:00 A.M. TO 11:00 A.M. AND 11:30 A.M. TO 3:00 P.M. MONDAY THRU FRIDAY EXCEPT HOLIDAYS.
9. THE COSTS OF ANY TEMPORARY RELOCATION OF HTCO FACILITIES DONE FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE BORNE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
10. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HTCO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HTCO, OR BY THE CONTRACTOR UNDER HTCO'S SUPERVISION, WITH ALL COSTS AND COORDINATION TO BE BORNE BY THE CONTRACTOR.
11. ANY WORK REQUIRED TO RELOCATE HTCO FACILITIES CONFLICTING WITH THE PROPOSED CONSTRUCTION AND THE EXISTENCE OF WHICH WERE NOT SHOWN ON THE PLANS SHALL BE BORNE BY THE CONTRACTOR.

WATER NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS," VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION," VOLUME 2, DATED 1985, AND THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS," VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
3. PAYMENT FOR ITEMS OF WORK CALLED FOR IN THE PLANS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY, BUT SHALL BE INCLUDED IN THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL COMPENSATION SHALL BE MADE.
4. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA, BUT ARE NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS HE MAY MAKE OR DERIVE FROM THE SUBSURFACE INFORMATION OR DATA FURNISHED ON THE PLANS. THE CONTRACTOR MUST SATISFY HIMSELF THROUGH HIS OWN INVESTIGATIONS AS TO WHAT SUBSURFACE CONDITIONS ARE TO BE ENCOUNTERED.
6. PRIOR TO START OF EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL AGENCIES AND UTILITIES AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL OF HIS CONSTRUCTION ACTIVITY AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
7. THE CONTRACTOR SHALL EXPOSE, VERIFY AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO EXCAVATION OF PIPELINE TRENCH. THE WATER MAIN ALIGNMENT AND GRADE MAY BE CHANGED IF THERE ARE ANY CONFLICTS WITH ANY EXISTING UNDERGROUND UTILITIES AND STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT. PAYMENT FOR WORK INCLUDED IN THIS PARAGRAPH WILL BE MADE UNDER THE APPROPRIATE BID ITEMS UNDER THE PROPOSAL, AND NO ADDITIONAL COMPENSATION WILL BE CONSIDERED.
8. EXISTING UTILITIES CROSSING THE WATER MAIN ARE TO REMAIN IN SERVICE AND IN PLACE. IF RELOCATED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE FOR A MINIMUM PERIOD OF TIME AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE BOARD OF WATER SUPPLY.
9. ANY COST WHEN DIRECTED BY THE BOARD OF WATER SUPPLY INCURRED BY GASCO, HECO, OR HTCO BY THIS PROJECT SHALL BE PAID BY THE BOARD OF WATER SUPPLY THROUGH THE CONTRACTOR. THE PAYMENT SHALL BE ONLY FOR THE ACTUAL COST AS SHOWN ON THE UTILITY COMPANY' INVOICE. NO PAYMENT WILL BE MADE FOR PROFIT, TAX, OVERHEAD AND BOND COST.
10. IF THE CONTRACTOR ELECTS NOT TO EXPOSE AND VERIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO PIPELINE EXCAVATION, HE FORFEITS HIS RIGHTS FOR ANY CLAIMS FOR COMPENSATION CAUSED BY ANY CONFLICTS WITH EXISTING UTILITIES AND STRUCTURES.
11. ALL A.C. AND CONCRETE PAVEMENT TO BE TRENCHED (FOR PIPELINE OR ANY WATER SYSTEM INSTALLATION) SHALL BE "SAW-CUT" TO THE REQUIRED WIDTH PRIOR TO REPAVING.
12. PAYMENT FOR RESTORATION OF DRIVEWAYS, CURBS AND GUTTERS WILL NOT BE MADE DIRECTLY, BUT SHALL BE INCLUDED IN THE UNIT PRICES BID IN THE VARIOUS ITEMS OF THE BID.
13. RESTORATION OF PAVEMENT SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND DONE WITH EQUIVALENT TO, OR BETTER, QUALITY MATERIALS.
14. UNLESS OTHERWISE SPECIFIED, CONNECTIONS TO EXISTING WATER MAINS AND CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH BOARD OF WATER SUPPLY'S INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT THE BWS PLANNING AND ENGINEERING DIVISION, ENGINEERING BRANCH, CONSTRUCTION SECTION.
15. WHEREVER CONNECTIONS TO EXISTING MAINS ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING MAINS PRIOR TO EXCAVATION OF MAIN TRENCH. THE REMAINING EXCAVATION FOR THE CONNECTION SHALL BE EXCAVATED WHEN THE CONTRACTOR IS READY TO MAKE THE CONNECTION.
16. ALL WATER MAIN TRENCHES IN STATE-OWNED HIGHWAYS SHALL BE BACKFILLED ACCORDING TO THE TRENCH RESTORATION DETAIL AS SHOWN ON THE PLANS. WATER MAIN TRENCHES IN PRIVATELY-OWNED STREETS SHALL BE BACKFILLED AS CALLED FOR UNDER PART III, SECTION 1.2.2, TRENCH BACKFILL, OF THE "WATER SYSTEM STANDARDS," DATED 1985. COMPACTION OF TRENCH BACKFILL SHALL MEET APPLICABLE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

WATER

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WATER NOTES (CONT.)

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS.

18. SHOULD MAJOR TREE ROOTS 2" AND GREATER BE ENCOUNTERED DURING CONSTRUCTION, THESE ROOTS SHALL BE CUT AND SEALED WITH ASPHALTIC PAINT.

19. PIPE ALTERNATIVES:
    A. DUCTILE IRON PIPES SHALL BE CLASS 52, WRAPPED WITH POLYETHYLENE.

    B. POLYVINYL CHLORIDE PIPES SHALL BE CLASS 150. ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF P.V.C. PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR P.V.C. PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.

    C. CONCRETE CYLINDER PIPES SHALL BE CLASS 150 AND SHALL BE MANUFACTURED AFTER ALL UNDERGROUND STRUCTURES AND UTILITIES ARE EXPOSED AND VERIFIED.

    PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR D.I. PIPE., VALVES AND FITTINGS.

20. DURING NON-WORKING HOURS, THE TRENCHES ON STATE HIGHWAYS SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC.

21. UNLESS OTHERWISE SPECIFIED, ALL ABANDONED LINES SHALL BE CUT AND PLUGGED WITH CLASS DWS 2000 CONCRETE. PAYMENT FOR CUTTING AND PLUGGING WILL NOT BE MADE DIRECTLY, BUT WILL BE INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL. THE CONTRACTOR SHALL VERIFY THE SIZE AND TYPE OF LINE TO BE PLUGGED.

22. ALL SALVAGE MATERIALS SHALL BE CLEANED, REPAINTED AND DELIVER TO THE KALIHI BWS CORPORATION YARD.

23. ALL WATER MAINS AND APPURTENANCES, SHALL BE SUBJECTED TO A HYDROSTATIC TEST PRESSURE OF 150 PSI BY THE CONTRACTOR IN THE PRESENCE OF THE BOARD OF WATER SUPPLY INSPECTOR.

24. AFTER INSTALLATION OF TAPPING SLEEVE AND TAPPING VALVE AND PRIOR TO TAPPING THE EXISTING WATER MAIN, THE ASSEMBLY SHALL BE PRESSURE TESTED AT 150 PSI ON BOTH SIDES OF THE VALVE AND IN ACCORDANCE WITH THE WATER SYSTEM STANDARDS DATED 1985.

25. MECHANICAL JOINT GLANDS SHALL BE "STRAIGHT-SIDED" AND POLYGON IN SHAPE, AS DESCRIBED IN AWWA C111, AND SHALL BE APPLICABLE TO BOTH CAST IRON AND DUCTILE IRON GLANDS, OR AN APPROVED EQUAL ON A JOB-TO-JOB BASIS.

26. ALL AIR RELIEF VALVES SHALL HAVE A MINIMUM WORKING PRESSURE RANGE OF 0 TO 150 PSI.

HECO NOTES:

1. THE LOCATION OF HAWAIIAN ELECTRIC COMPANY'S (HECO) OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT WITHIN OR UNDER ANY OVERHEAD LINES.

2. THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAW (DOSH).

3. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HECO'S MAPPING AND RECORDS DIVISION LOCATED AT 820 WARD AVENUE, 4TH FLOOR, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. REFER TO HECO REQUEST NUMBER AT THAT TIME.

4. FOR VERIFICATION OF UNDERGROUND LINES OR FOR ASSISTANCE IN SUPPORTING AND PROTECTING THESE LINES, THE CONTRACTOR SHALL CALL HECO'S UNDERGROUND DIVISION AT 543-7345 A MINIMUM OF 72 HOURS IN ADVANCE.

5. WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HECO EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENTS, AND FOR PROTECTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNING TO FULLY PROTECT THESE FROM DAMAGE.

6. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HECO DISTRICT CONSTRUCTION SUPERINTENDENT (AT KOOLAU, PHONE 261-6085) A MINIMUM OF 72 HOURS IN ADVANCE.

7. ANY WORK REQUIRED TO RELOCATE HECO FACILITIES, INCLUDING TEMPORARY RELOCATION DONE FOR THE CONVENIENCE OF THE CONTRACTOR, SHALL BE DONE BY HECO AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND FOR COSTS IF APPLICABLE, UNLESS OTHERWISE NOTED.

8. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HECO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION, WITH ALL COSTS BEING BORNE BY THE CONTRACTOR.

9. ANY UNFORESEEN CONFLICT THAT WOULD RESULT IN THE REDESIGN OR RELOCATION (EITHER TEMPORARY OR PERMANENT) OF HECO'S ELECTRICAL FACILITIES MAY BE CAUSE FOR LENGTHY DELAYS. TO AVOID SUCH DELAYS, THE CONTRACTOR MUST NOTIFY HECO OF THE CONFLICT A MINIMUM OF 30 DAYS PRIOR TO THE START OF CONSTRUCTION.

10. ANY DAMAGE TO HECO'S FACILITIES WILL BE REPORTED IMMEDIATELY TO HECO'S TROUBLE DISPATCHER AT PH. 543-7874.

11. ALL HECO OVERHEAD AND UNDERGROUND FACILITIES SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION. COSTS FOR DAMAGES TO HECO FACILITIES SHALL BE BORNE BY THE CONTRACTOR. THIS REPAIR WORK SHALL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION.

12. THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HECO FROM AND AGAINST ALL LOSSES, DAMAGES CLAIMS AND ACTIONS, ALL EXPENSES INCIDENTAL TO SUCH LOSSES, DAMAGES, CLAIMS OR ACTION, BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTIONS OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY UPON THE SOLE NEGLIGENCE OF HECO.

Prepared by:

ASSOCIATES, INC.
Engineers/Architects

T-2

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C

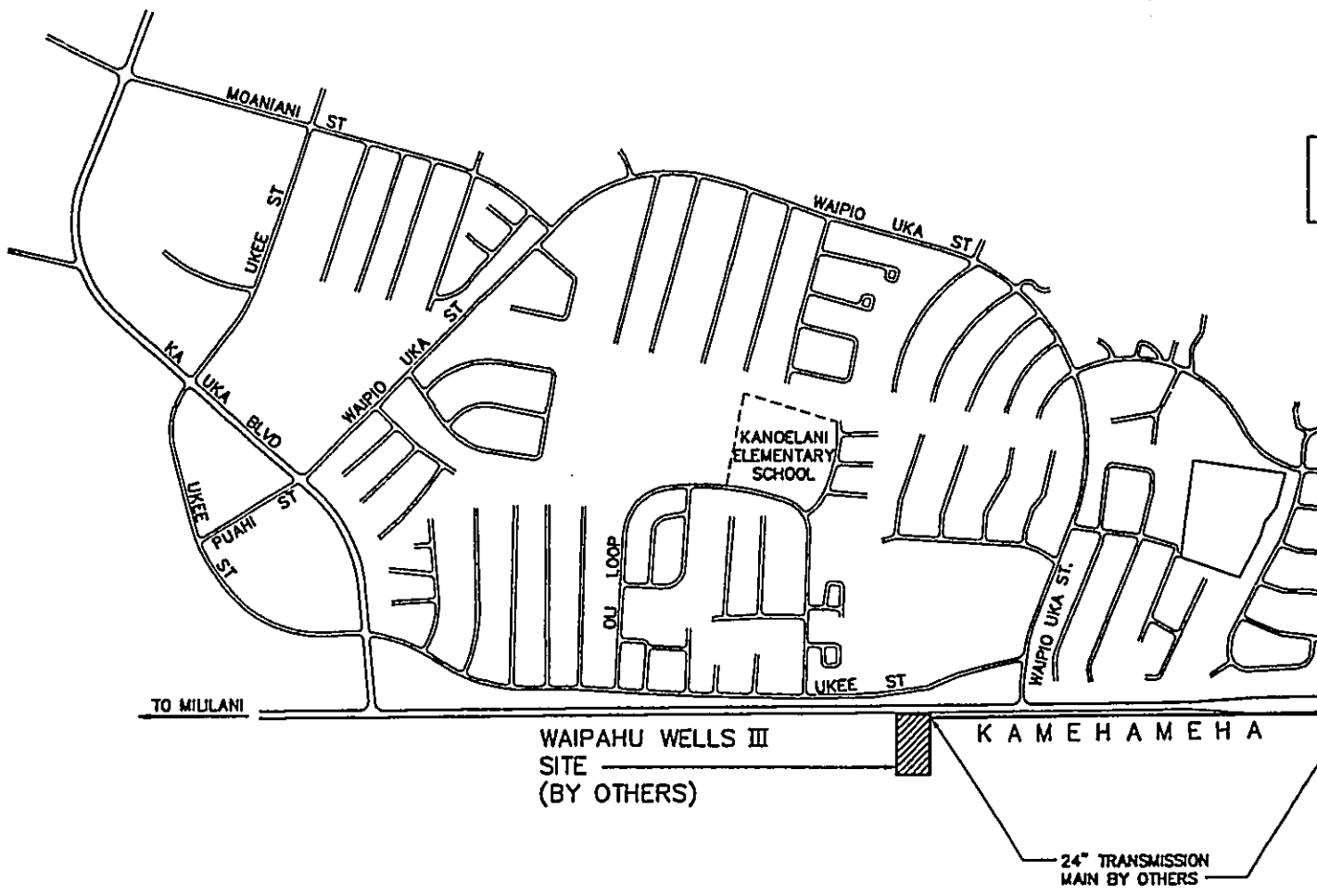
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE

INDEX OF DRAWINGS AND NOTES

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: JLS	ENGINEER: HTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO:	SCALE: AS NOTED	SHEET 2 OF _____ SHEETS	

WATER-P2 02/10/95 06:59 100%



LEGEND

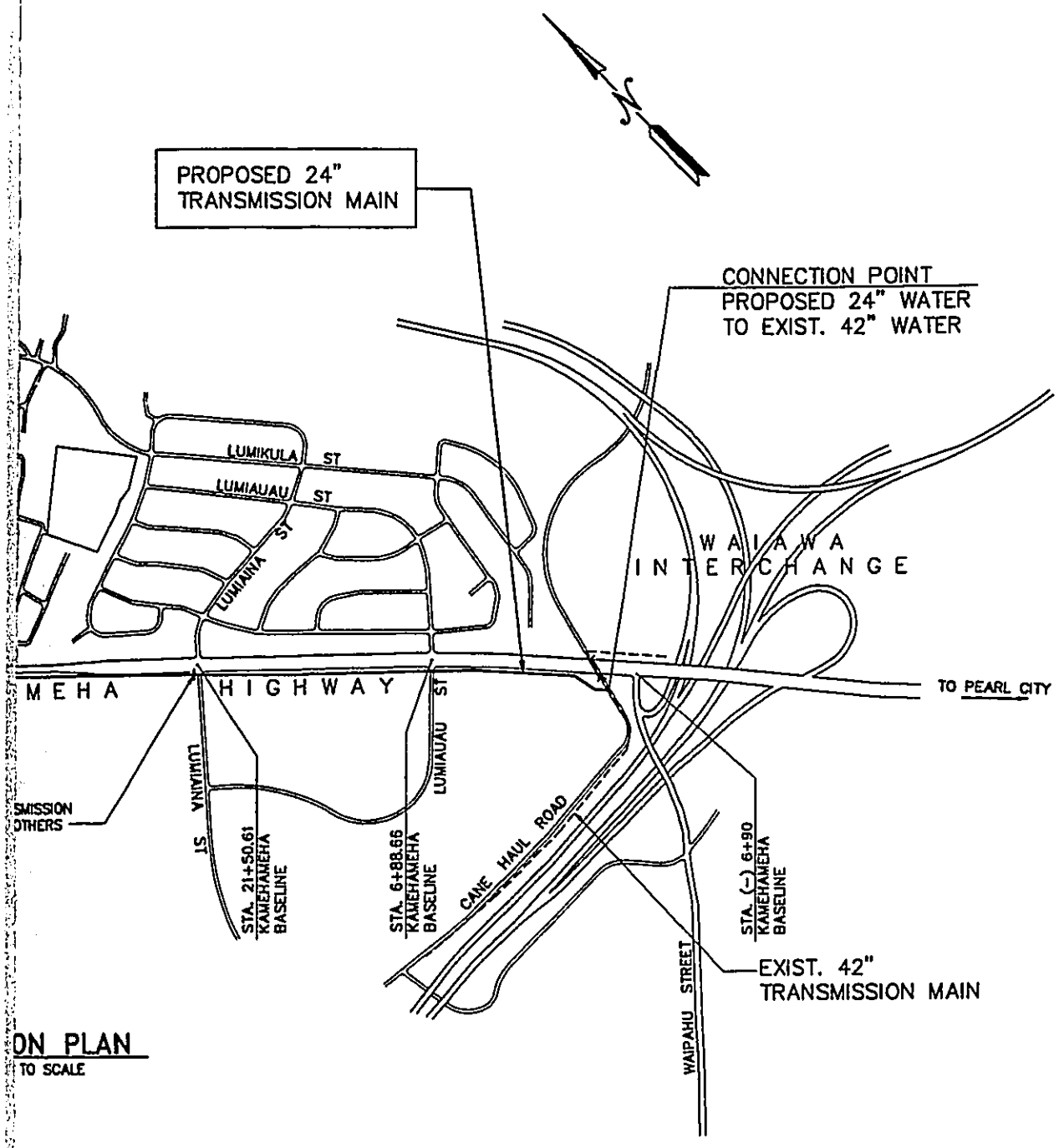
NEW 24" TRANSMISSION MAIN	7+00
NEW 24" BGGV W/ MANHOLE	
NEW EDGE OF PAVEMENT	
STORM DRAIN 24" (BY OTHERS)	D24"
STORM DRAIN INLET (BY OTHERS)	
SEWER LINE (BY OTHERS)	S18"
SEWER MANHOLE (BY OTHERS)	
ELECTRICAL LINES (BY OTHERS)	ELEC
WORK DONE BY OTHERS (CURBS, ETC.)	
STRIPING BY OTHERS	
KAMEHAMEHA HWY. BASELINE	0+00
EXISTING RIGHT-OF-WAY	
EXISTING FLOW LINES	
EXISTING CONTOURS	306
EXISTING TREES	
EXISTING WALLS	

EXISTING 84" STORM DRAIN	E/D84"
EXISTING 36" STORM DRAIN	E/D36"
EXISTING 24" STORM DRAIN	E/D24"
EXISTING STORM DRAIN INLET	
EXISTING STORM DRAIN MANHOLE	SDMH
EXISTING 12" SEWER	E/S12"
EXISTING SEWER MANHOLE	
EXISTING ELECTRICAL LINES	E/ELEC
EXISTING HECO BOX	HECO
EXISTING TRAFFIC SIGNAL BOX	TSB
EXISTING STREET LIGHT BOX	SLB
EXISTING CATV BOX	CATV
EXISTING STREET LIGHT	
EXISTING STREET LIGHT	
EXISTING POWER POLES	PP

LOCATION PLAN

SCALE: NOT TO SCALE

EXISTING GUY ANCHOR	
EXISTING 6" GAS	E/G6"
EXISTING SIGNAL CABLE	E/SC
EXISTING TELEPHONE POLES	TP
EXISTING TELEPHONE BOX	TEL. BO
EXISTING TELEPHONE MANHOLE	HTCO MH
EXISTING 12" WATER	E/W12"
EXISTING 16" WATER	E/W16"
EXISTING WATER MANHOLE	WMH
ABANDONED 36" STORM DRAIN	E/D36" (AB



ON PLAN
TO SCALE

GRAPHIC SCALE:

500' 0 500' 1000' 1500'

SCALE: 1"=500'

E/G6"
E/SC
TP
TEL. BOX
HTCO
MH
E/W12"
E/W16"
WMH
E/D36" (ABAND.)

Prepared by:

ASSOCIATES, INC.

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

T-3

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE
LOCATION PLAN AND LEGEND

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NPP ENGINEER: HTT CHECKED BY: AKA FILE NO.
FIELD BOOK NO. SCALE: AS NOTED SHEET 3 OF _____ SHEETS

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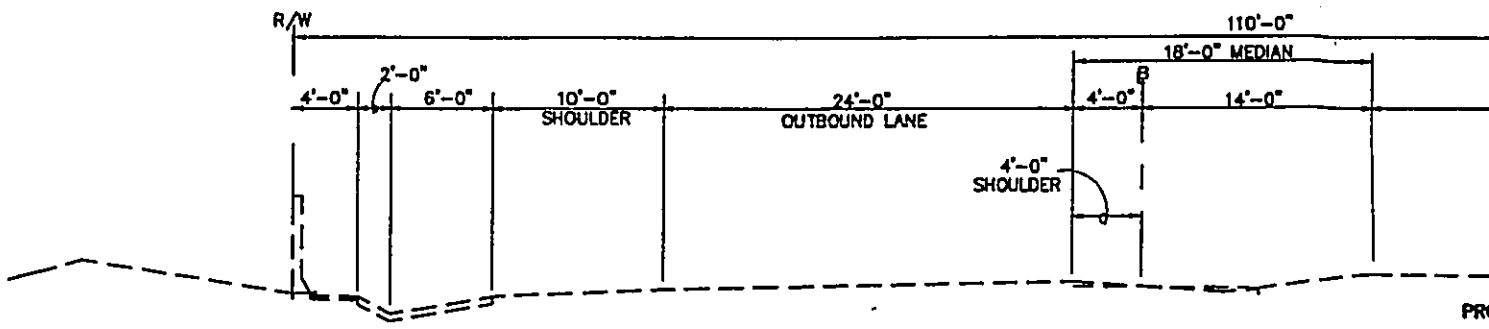
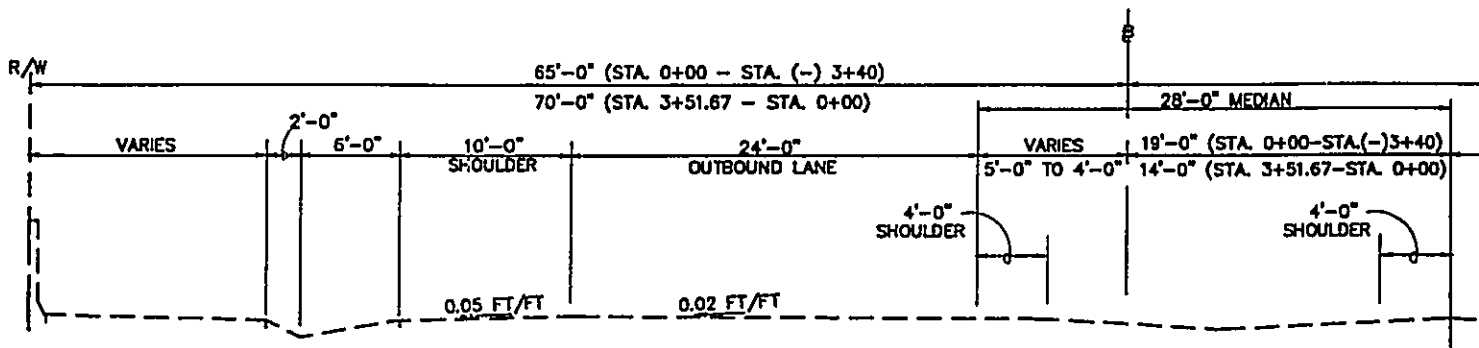


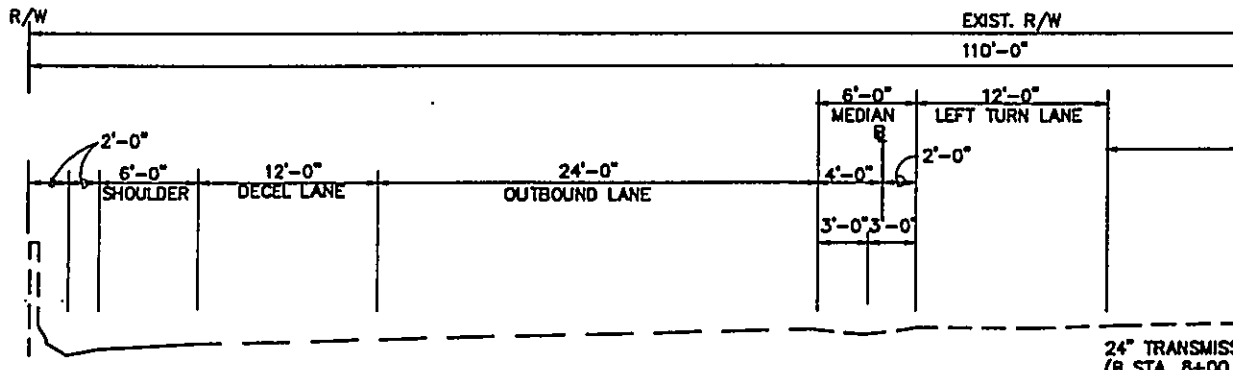
24" TRANSMISSION MAIN ALONG KAMEHAMEHA
TYP. EXIST. RD. SECTION
STA. 32+30 TO 3+51.67

SCALE: NTS



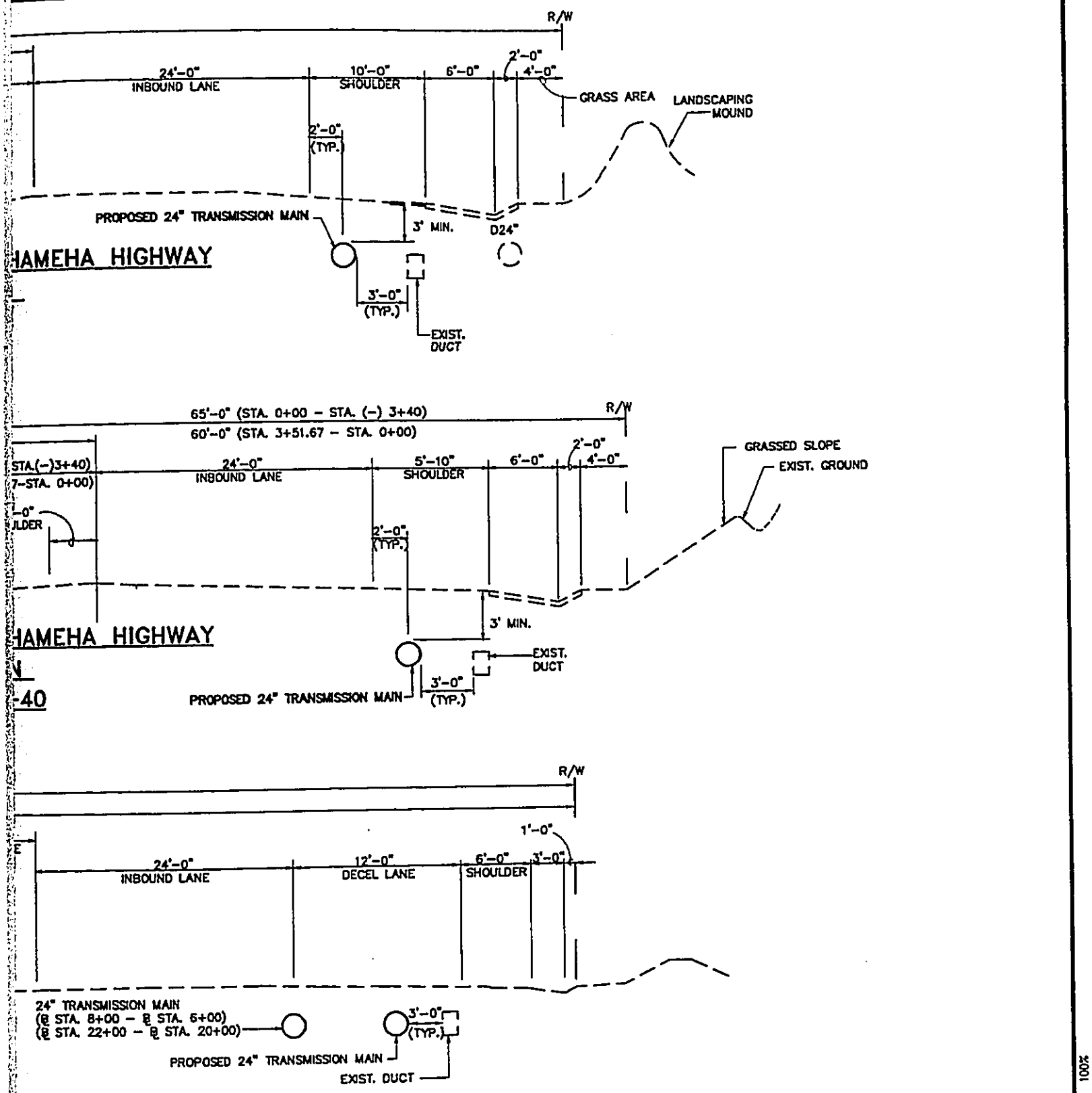
24" TRANSMISSION MAIN ALONG KAMEHAMEHA
TYP. EXIST. RD. SECTION
STA. 3+51.67 TO (–)3+40

SCALE: NTS



24" TRANSMISSION MAIN ALONG KAMEHAMEHA H
TYPICAL EXIST. ROAD SECTION WITH DECELERATI

SCALE: NTS



Prepared by:

ASSOCIATES, INC.
Engineers/Architects

C-1

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE
TYPICAL WATER SECTIONS - 1

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO.	SCALE: AS NOTED	SHEET 6 OF _____ SHEETS	

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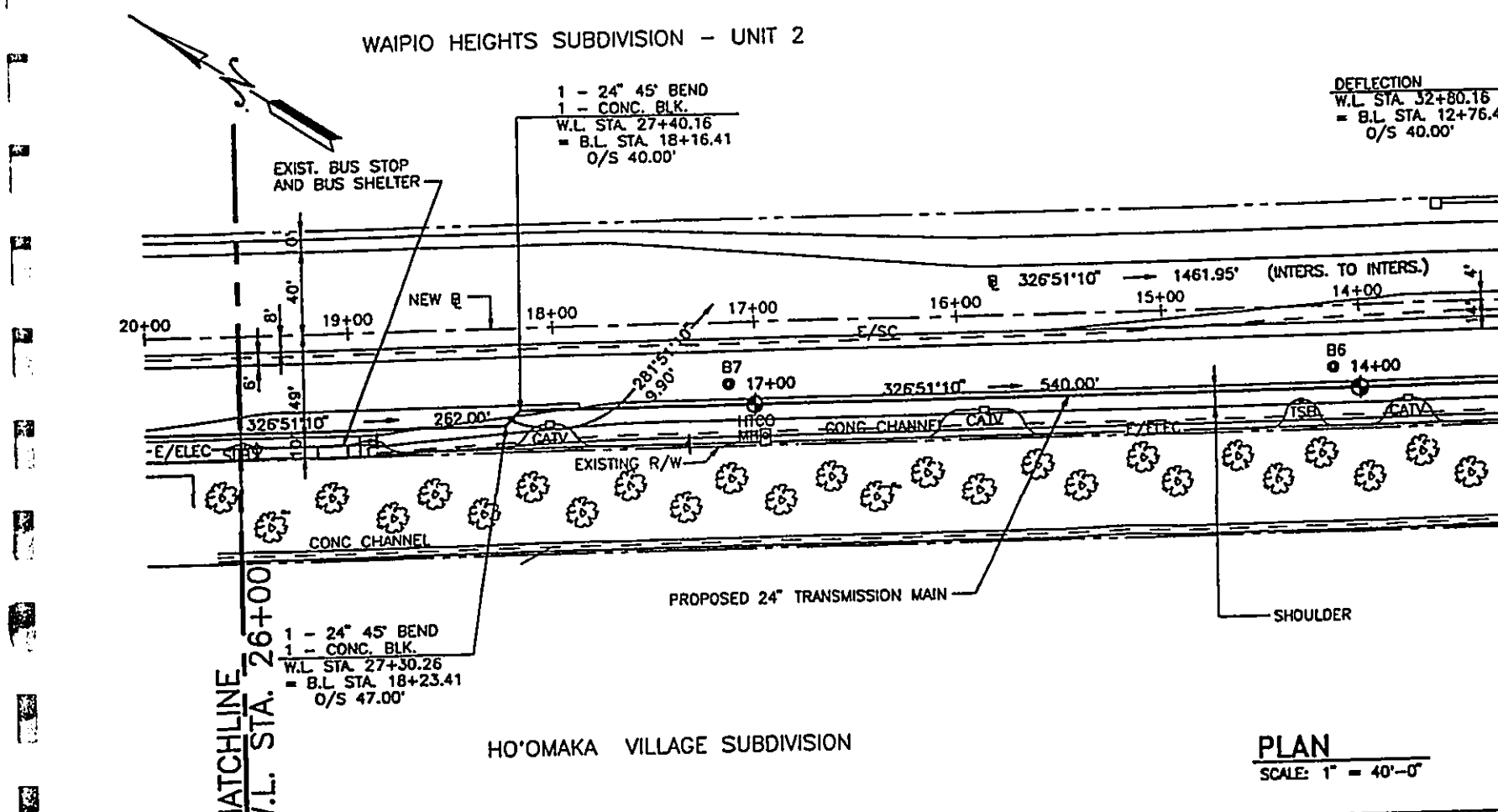
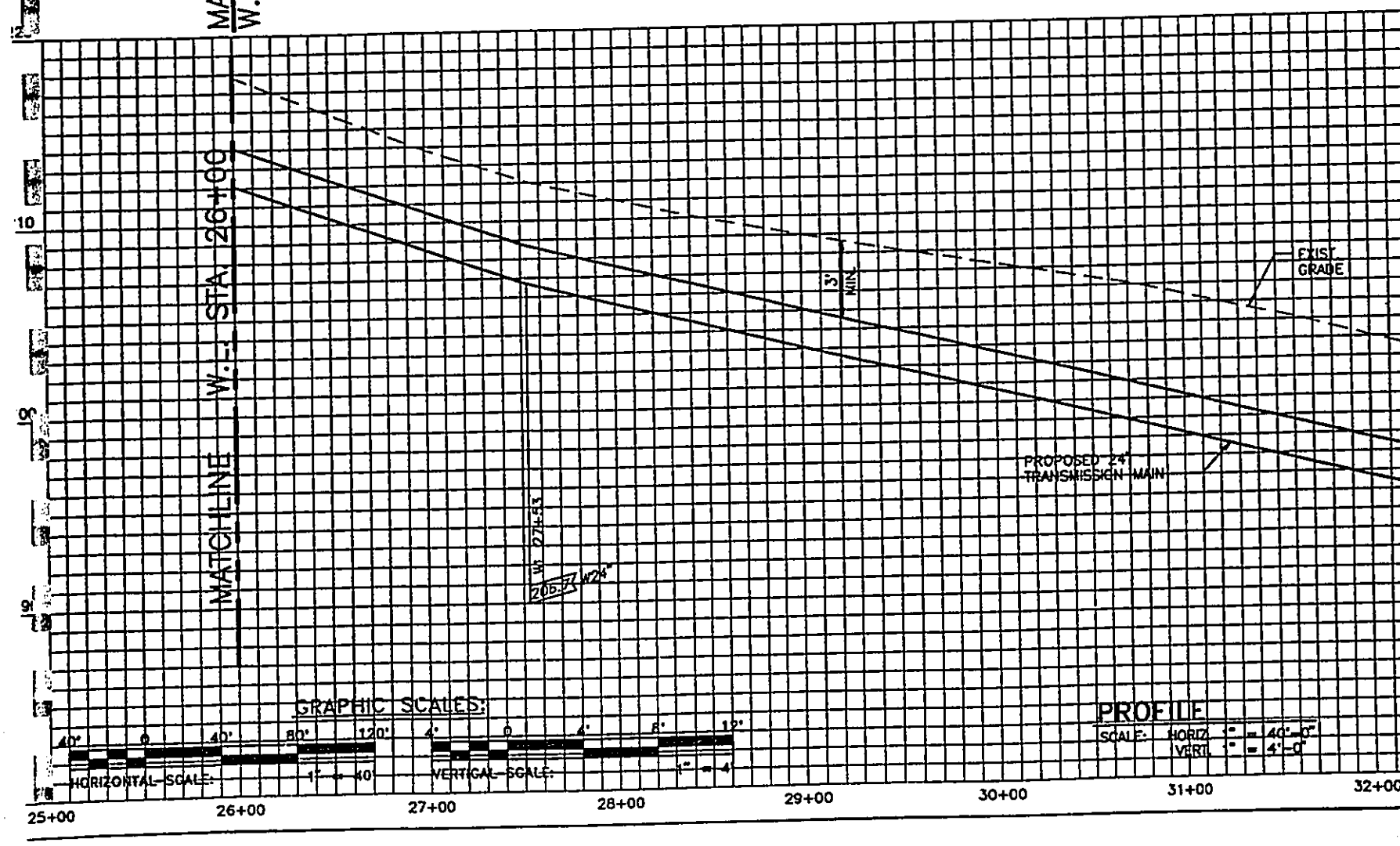
WAIPIO HEIGHTS SUBDIVISION – UNIT 2

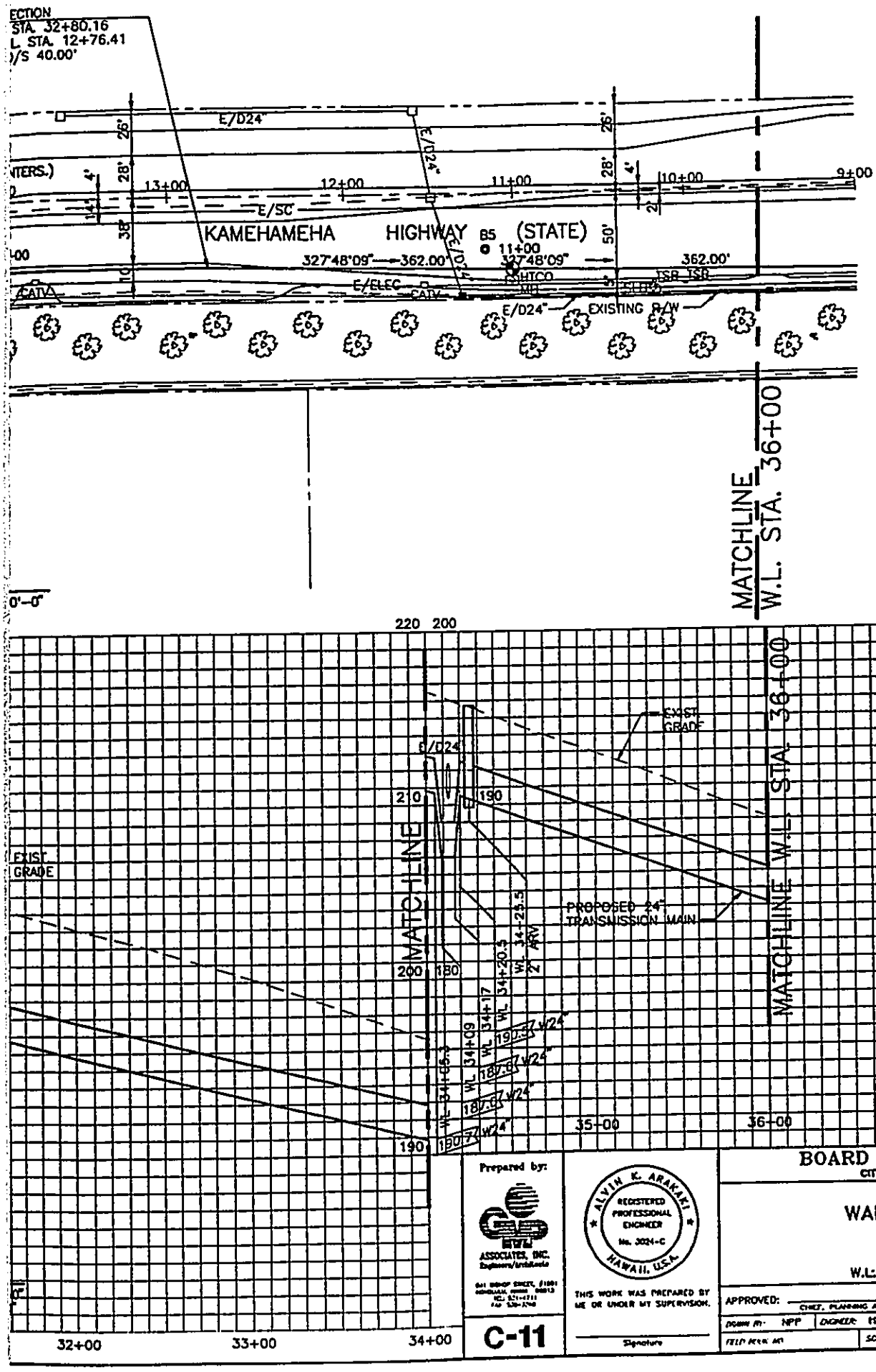


HO'OMAKA VILLAGE SUBDIVISION

PLAN
SCALE: 1" = 40'-0"



PROFILE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"



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841 BISHOP STREET, #1001 HONOLULU, HAWAII 96813 TEL: 521-1711 FAX: 536-1748

C-11

ALVIN K. ARAKAKI REGISTERED PROFESSIONAL ENGINEER No. 3024-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

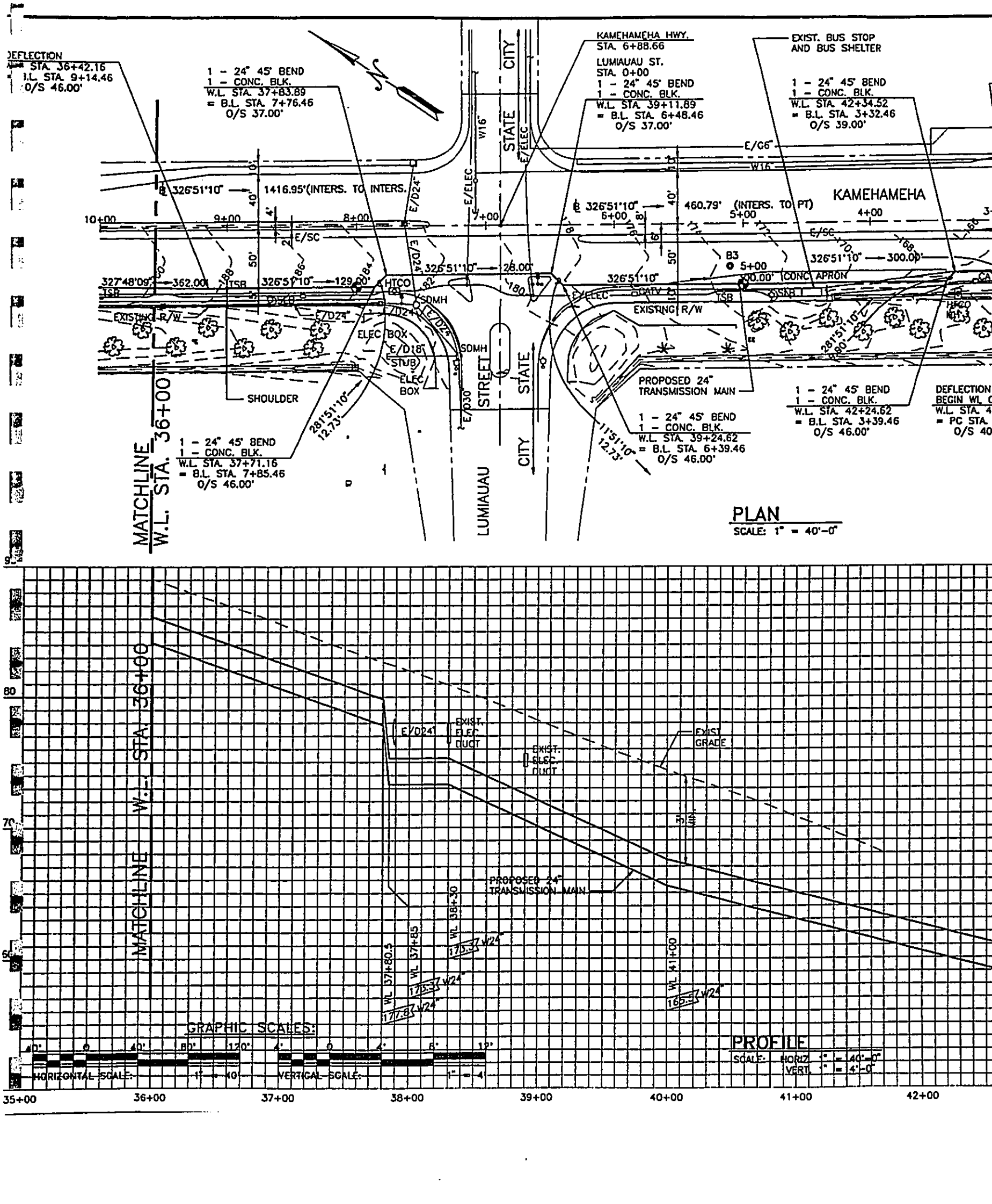
JOB NO.
WAIPAHU WELLS III

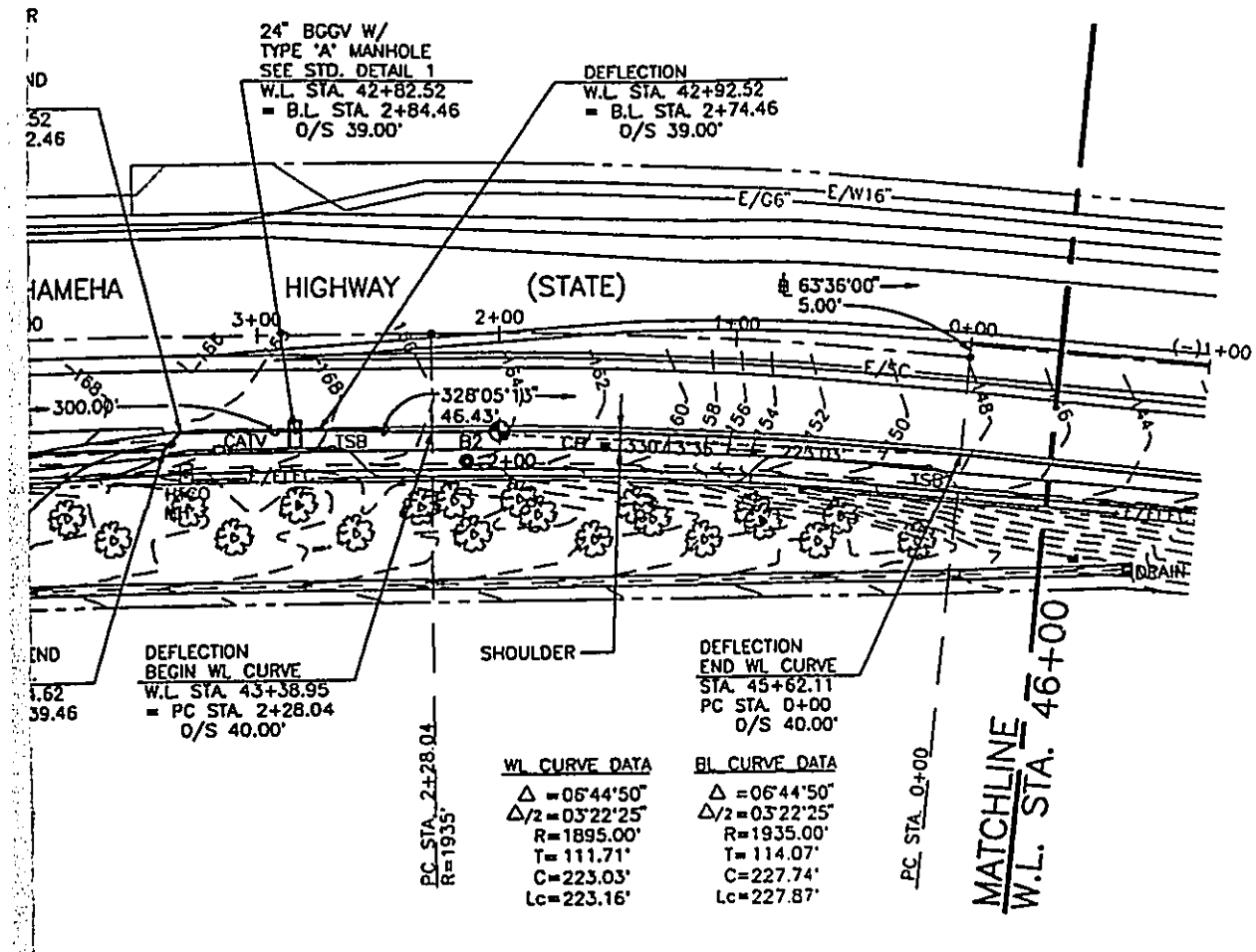
PLAN AND PROFILE
W.L. STA. 26+00 TO 36+00

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: 11/01/94

DRAWN BY: NPP | ENGINEER: HTT | CHECKED BY: AKA | FILE NO.

FIELD BOOK NO. | SCALE: AS NOTED | SHEET ____ OF ____ SHEETS


DEFLECTION
STA. 36+42.16
I.L. STA. 9+14.46
O/S 46.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 37+83.89
= B.L. STA. 7+76.46
O/S 37.00'
CITY
STATE
W16
E/ELEC
KAMEHAMEHA HWY.
STA. 6+88.66
LUMIAUAU ST.
STA. 0+00
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 39+11.89
= B.L. STA. 6+48.46
O/S 37.00'
EXIST. BUS STOP
AND BUS SHELTER
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 42+34.52
= B.L. STA. 3+32.46
O/S 39.00'
E/G6"
W16
℄ 326°51'10" → 1416.95'(INTERS. TO INTERS.
℄ 326°51'10" → 460.79' (INTERS. TO PT)
KAMEHAMEHA
E/SC
E/D24"
327°48'09" → 362.00'
326°51'10" → 129.80'
326°51'10" → 28.00'
326°51'10" → 300.00'
B3
5+00
100.00' CONC. APRON
TSB
HTCO
SDMH
SNB
CATV
E/ELEC
EXISTING R/W
ELEC. BOX
E/D18" STUB
E/D30"
STREET
SHOULDER
PROPOSED 24"
TRANSMISSION MAIN
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 37+71.16
= B.L. STA. 7+85.46
O/S 46.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 39+24.62
= B.L. STA. 6+39.46
O/S 46.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 42+24.62
= B.L. STA. 3+39.46
O/S 46.00'
DEFLECTION
BEGIN WL
W.L. STA. 4
= PC STA.
O/S 40
MATCHLINE
W.L. STA. 36+00
LUMIAUAU
PLAN
SCALE: 1" = 40'-0"
MATCHLINE W.L. STA. 36+00
E/D24"
EXIST. ELEC. DUCT
EXIST. ELEC. DUCT
EXIST GRADE
PROPOSED 24" TRANSMISSION MAIN
WL 37+80.5
WL 37+85
WL 38+30
WL 41+00
GRAPHIC SCALES:
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'
PROFILE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"
35+00
36+00
37+00
38+00
39+00
40+00
41+00
42+00



Prepared by:

ASSOCIATES, INC.

C-12

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

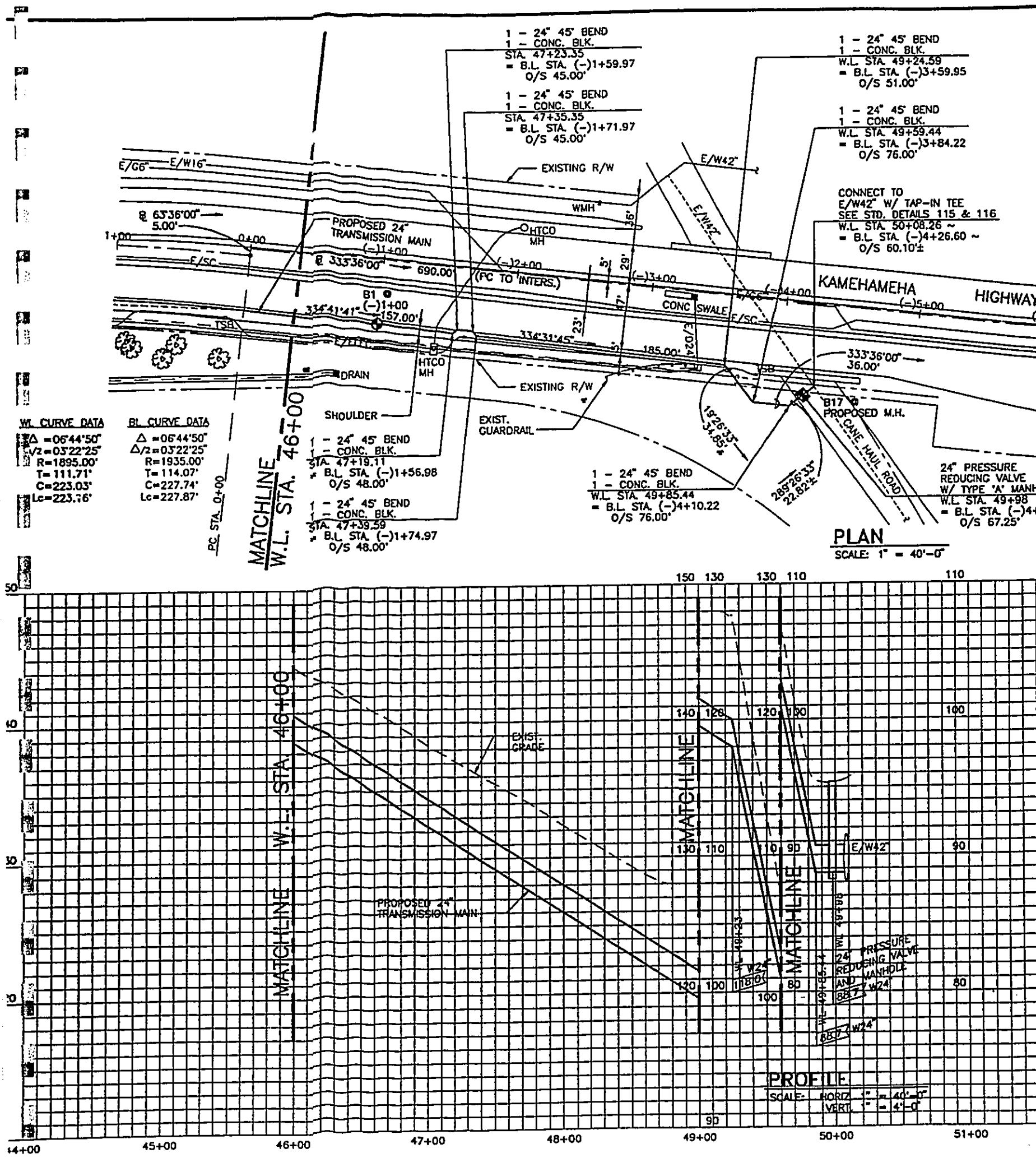
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO.
WAIPAHU WELLS III

PLAN AND PROFILE
W.L. STA. 36+00 TO 46+00

APPROVED: _____ DATE: 11/01/94
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NPP	ENGINEER: MTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO	SCALE: AS NOTED	SHEET ___ OF ___ SH


1 - 24" 45° BEND
1 - CONC. BLK.
STA. 47+23.35
= B.L. STA. (-)1+59.97
O/S 45.00'
1 - 24" 45° BEND
1 - CONC. BLK.
STA. 47+35.35
= B.L. STA. (-)1+71.97
O/S 45.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 49+24.59
= B.L. STA. (-)3+59.95
O/S 51.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 49+59.44
= B.L. STA. (-)3+84.22
O/S 76.00'
CONNECT TO
E/W42" W/ TAP-IN TEE
SEE STD. DETAILS 115 & 116
W.L. STA. 50+08.26 ~
= B.L. STA. (-)4+26.60 ~
O/S 60.10'±
E/W16"
E/G6"
EXISTING R/W
E/W42"
WMH
HTCO MH
PROPOSED 24" TRANSMISSION MAIN
@ 63°36'00" 5.00'
@ 333°36'00" 690.00'
(PC TO INTERS.)
B1
(-)1+00
334°41'41" 157.00'
TSB
E/T11"
DRAIN
SHOULDER
E/SC
CONC SWALE
KAMEHAMEHA HIGHWAY
E/C6
E/W24"
333°36'00" 36.00'
B17
PROPOSED M.H.
EXIST. GUARDRAIL
CANE HAUL ROAD
24" PRESSURE REDUCING VALVE W/ TYPE 'A' MANH
W.L. STA. 49+98
= B.L. STA. (-)4+
O/S 67.25'
1 - 24" 45° BEND
1 - CONC. BLK.
STA. 47+19.11
= B.L. STA. (-)1+56.98
O/S 48.00'
1 - 24" 45° BEND
1 - CONC. BLK.
STA. 47+39.59
= B.L. STA. (-)1+74.97
O/S 48.00'
1 - 24" 45° BEND
1 - CONC. BLK.
W.L. STA. 49+85.44
= B.L. STA. (-)4+10.22
O/S 76.00'
MATCHLINE W.L. STA. 46+00
PC STA. 0+00
WL CURVE DATA
Δ =06°44'50"
Δ/2=03°22'25"
R=1895.00'
T=111.71'
C=223.03'
Lc=223.16'
BL CURVE DATA
Δ =06°44'50"
Δ/2=03°22'25"
R=1935.00'
T=114.07'
C=227.74'
Lc=227.87'
PLAN
SCALE: 1" = 40'-0"
MATCHLINE W.L. STA. 46+00
EXIST. GRADE
PROPOSED 24" TRANSMISSION MAIN
MATCHLINE
E/W42
24" PRESSURE REDUCING VALVE AND MANHOLE
PROFILE
SCALE- HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00

END
7.59
3+59.95

END
3.44
3+84.22

IN TEE
S 115 & 116
3.26 ~
4+26.60 ~

KAMEHAMEHA HWY.
STA. (–)6+90

HIGHWAY (STATE)

(–)6+00

(–)7+00

WAIPAHU STREET

24" PRESSURE
REDUCING VALVE
W/ TYPE 'A' MANHOLE
W.L. STA. 49+98
= B.L. STA. (–)4+19.23
O/S 67.25'

110

100

90

80

51+00

GRAPHIC SCALES:

HORIZONTAL SCALE: 40' 0 40' 80' 120' 1" = 40'

VERTICAL SCALE: 4' 0 4' 8' 12' 1" = 4'

Prepared by:

ASSOCIATES, INC.
Engineers/Architects
841 BISHOP STREET, #1001
HONOLULU, HAWAII 96813
PH: 521-4711
FAX: 536-2290

ALVIN K. ARAKAKI
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No. 3024-C
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

C-13

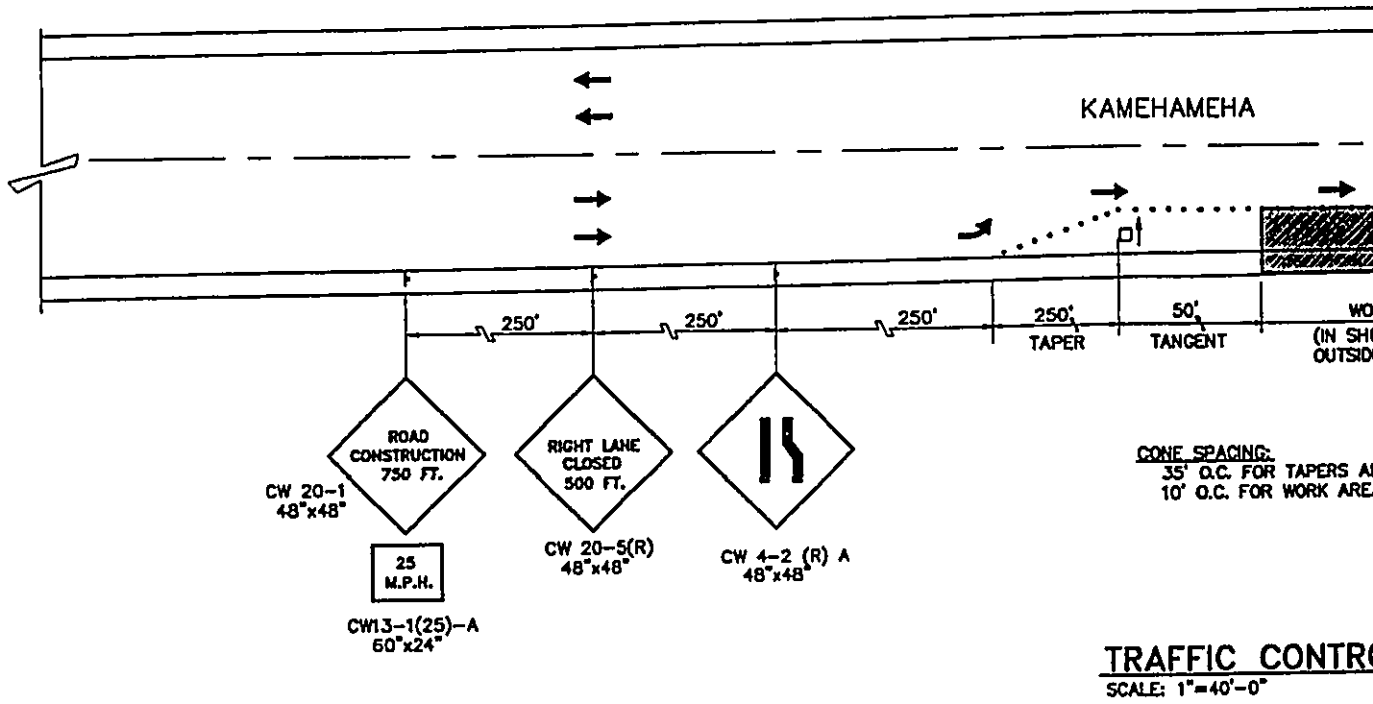
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO.
WAIPAHU WELLS III

PLAN AND PROFILE
W.L. STA. 46+00 TO 50+08.26 ~

APPROVED: _____ DATE: 11/01/94
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NPP	ENGINEER: HTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO.	SCALE: AS NOTED	SHEET ___ OF ___ SHTS.	



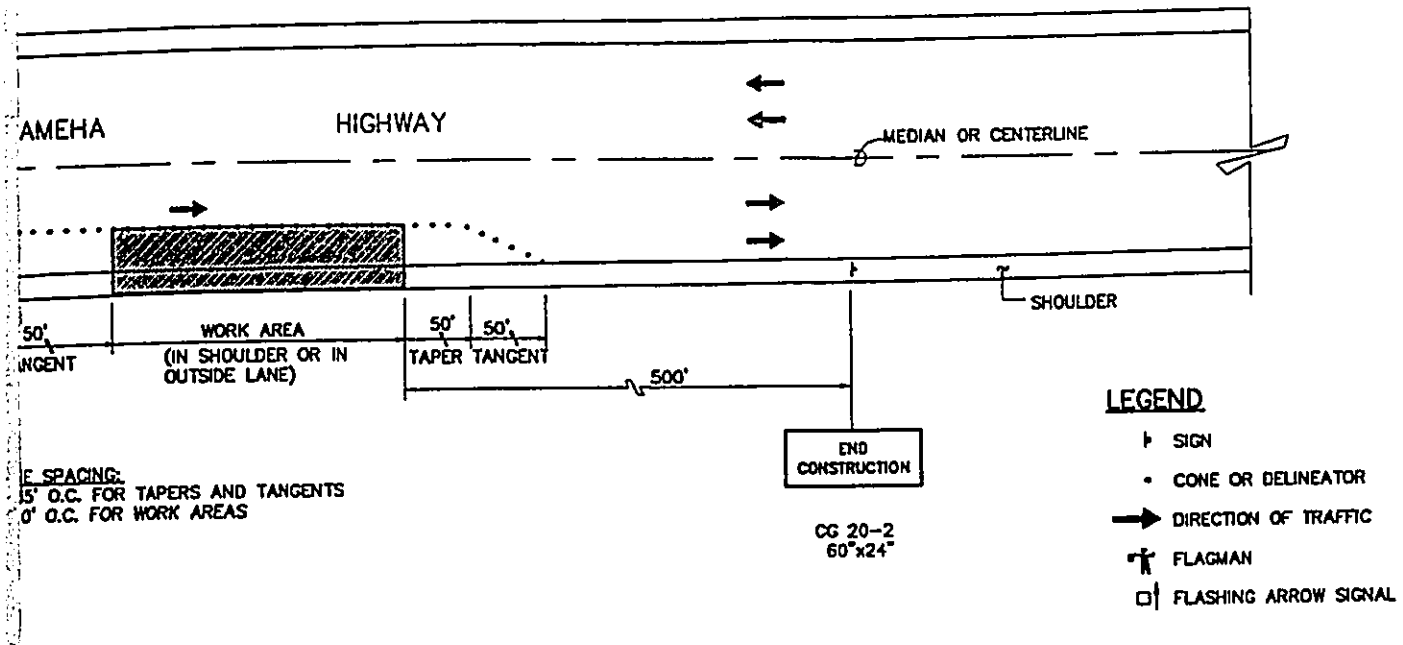
TRAFFIC CONTR
SCALE: 1"=40'-0"

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A CONSTRUCTION PERMIT FROM THE STATE'S HIGHWAY DISTRICT ENGINEER AT 727 KAKOI STREET PRIOR TO COMMENCEMENT OF WORK WITHIN STATE HIGHWAY RIGHT-OF-WAY.
2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN STATE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.
3. ALL LANES SHALL BE OPENED TO TRAFFIC DURING THE MORNING PEAK HOURS FROM 5:00 A.M. TO 8:30 A.M. AND DURING THE AFTERNOON PEAK HOURS FROM 3:00 P.M. TO 6:00 P.M., AND DURING OFF-WORK HOURS. DURING WORKING HOURS ONLY ONE LANE OF KAMEHAMEHA HIGHWAY SHALL BE CLOSED AT ANY ONE TIME.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI- TRAFFIC CONTROL FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS" IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION. A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.
5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:
   4" ASPHALT CONCRETE, 8" ASPHALT CONCRETE BASE AND 12" AGGREGATE SUBBASE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.
6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.
7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATIONS OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:
   A. SUBBASE: AT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.
   B. BASE COURSE: AT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.
   C. ASPHALT CONCRETE PAVEMENTAT EACH LIFT AT EVERY 50 LINEAR FEET OF TRENCH.
8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE NEW CENTERLINE OF UTILITY TRENCH AND THAT SUCH INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.
9. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADEQUATE, SAFE, NON-SKID BRIDGING MATERIAL OVER THE TRENCH, INCLUDING SHORING, WHEN TRENCHING IN PAVEMENT AREAS TO HANDLE ALL TYPES OF VEHICULAR TRAFFIC.
10. NO TRENCH SHALL BE OPENED MORE THAN 100 FEET IN ADVANCE OF THE INSTALLED AND TESTED PIPE.
11. LONGITUDINAL DRAINGE ALONG THE HIGHWAY SHALL
12. PAVEMENT STRIPING SHALL BE DONE BY CONTRACTO
13. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL THEREOF FROM THE DATE OF NOTIFICATION OF APPR EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN APPLICANT WILL BE REQUIRED TO RESUBMIT HIS CON REVIEW AND APPROVAL.
14. ALL REGULATORY, GUIDE AND CONSTRUCTION SIGNS INTENSITY REFLECTIVE SHEETING.
15. CONTRACTOR SHALL INFORM THE STATE PERMIT OFFI DAYS PRIOR TO CLOSING ANY LANES.
16. DRIVEWAY SHALL BE KEPT OPEN UNLESS THE OWNE RIGHTS-OF-WAYS ARE OTHERWISE PROVIDED FOR SA
17. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE P BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEW
18. THE CONTRACTOR SHALL REFERENCE TO THE SATISF EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MA OF CONSTRUCTION. THE CONTRACTOR SHALL REPLA REPAIR ALL TRAFFIC SIGNS, POSTS AND PAVEMENT UNLESS DIRECTED OTHERWISE BY THE DISTRICT ENGI
19. THE CONTRACTOR SHALL EXERCISE CARE WHEN EXC EXISTING FACILITIES SHALL BE IMMEDIATELY REPORTE CITY OR STATE AGENCY. THE REPAIR WORK SHALL
20. THE CONTRACTOR SHALL NOTIFY THE HIGHWAY LIGH SDOT, THREE (3) WORKING DAYS PRIOR TO COMMEN

GENERAL NOTES FOR TRAFFIC CONTR

1. THE PERMITEE SHALL MAKE MINOR ADJUSTMENTS A STRUCTURES, ETC., TO FIT FIELD CONDITIONS.
2. CONES OR DELINEATORS SHALL BE EXTENDED TO A APPROACHING TRAFFIC.
3. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SU FROM THE WORK AREA SHALL BE PLACED FIRST. TH PROGRESSIVELY TOWARD THE WORK AREA.



E SPACING:
5' O.C. FOR TAPERS AND TANGENTS
0' O.C. FOR WORK AREAS

FFIC CONTROL PLAN

1"=40'-0"

THE HIGHWAY SHALL BE MAINTAINED.

E DONE BY CONTRACTOR.

RUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE YEAR
NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE
NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE
TO RESUBMIT HIS CONSTRUCTION PLANS FOR DIVISION'S

CONSTRUCTION SIGNS AND BARRICADES SHALL BE OF HIGH
NG.

THE STATE PERMIT OFFICE (831-6712) AT LEAST TWO (2)
LANES.

EN UNLESS THE OWNERS OF THE PROPERTY USING THESE
WISE PROVIDED FOR SATISFACTORILY.

S EXIST. THEY SHALL BE MAINTAINED IN PASSABLE CONDITION
DESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS
RSECTIONS SHALL LIKEWISE BE PROVIDED.

ERENCE TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL
TS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT
TRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS,
OSTS AND PAVEMENT MARKINGS DISTRIBUTED BY HIS ACTIVITIES,
BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

RCISE CARE WHEN EXCAVATING IN THIS AREA. DAMAGES TO THE
IMMEDIATELY REPORTED TO THE RESPECTIVE UTILITY COMPANIES.
REPAIR WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.

IFY THE HIGHWAY LIGHTING AND TRAFFIC SIGNAL SUPERVISOR,
YS PRIOR TO COMMENCING WORK IN THIS AREA (834-4581).

TRAFFIC CONTROL PLAN

INOR ADJUSTMENTS AT INTERSECTIONS, DRIVEWAYS, BRIDGES,
LD CONDITIONS.

L BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO

ALL BE INSTALLED SUCH THAT THE SIGN OR DEVICE FARTHEST
BE PLACED FIRST. THE OTHERS SHALL THEN BE PLACED
WORK AREA.

4. REGULATORY AND WARNING SIGNS WITHIN THE CONSTRUCTION ZONE THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED. ALL SIGNS SHALL BE RESTORED UPON COMPLETION OF THE WORK.
5. FLAGGERS AND /OR POLICE OFFICERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
6. WHEN REQUIRED BY THE ISSUING OFFICE, THE PERMITTEE SHALL INSTALL A FLASHING ARROW SIGNAL OR CHANGEABLE MESSAGE BOARD AS SHOWN ON THE TRAFFIC CONTROL PLANS, OR AS DIRECTED BY THE STATE INSPECTOR/ENGINEER.
7. THE CONTRACTOR SHALL NOTIFY THE OAHU TRANSIT SERVICES INC. (OTS), ED SNIFFEN, AT 848-4571 OR LOWELL TOM AT 848-4578 TWO WEEKS PRIOR TO BEGINNING ANY WORK, INFORMING THEM OF LOCATION, SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUS STOP.
8. ALL TRAFFIC LANES SHALL BE A MINIMUM OF 10 FEET WIDE.
9. ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE.
10. THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PERCLUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (i.e., WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
11. AT END OF EACH DAY'S WORK OR AS SOON AS THE WORK IS COMPLETED, THE PERMITTED SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC. REMOVAL SHALL BE IN THE REVERSE ORDER OF INSTALLATION.
12. REPLACE PERMANENT PAVEMENT MARKINGS AND TRAFFIC SIGNS UPON COMPLETION OF EACH PHASE WORK TO THE SATISFACTION OF THE STATE INSPECTOR/ENGINEER.

GRAPHIC SCALE:

40' 0 40' 80' 120'

SCALE: 1"=40'

Prepared by:

ASSOCIATES, INC.
Engineers/Architects

C-5

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C

KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE

TRAFFIC CONTROL PLAN & NOTES

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO:	SCALE: AS NOTED	SHEET 13 OF _____ SHEETS	

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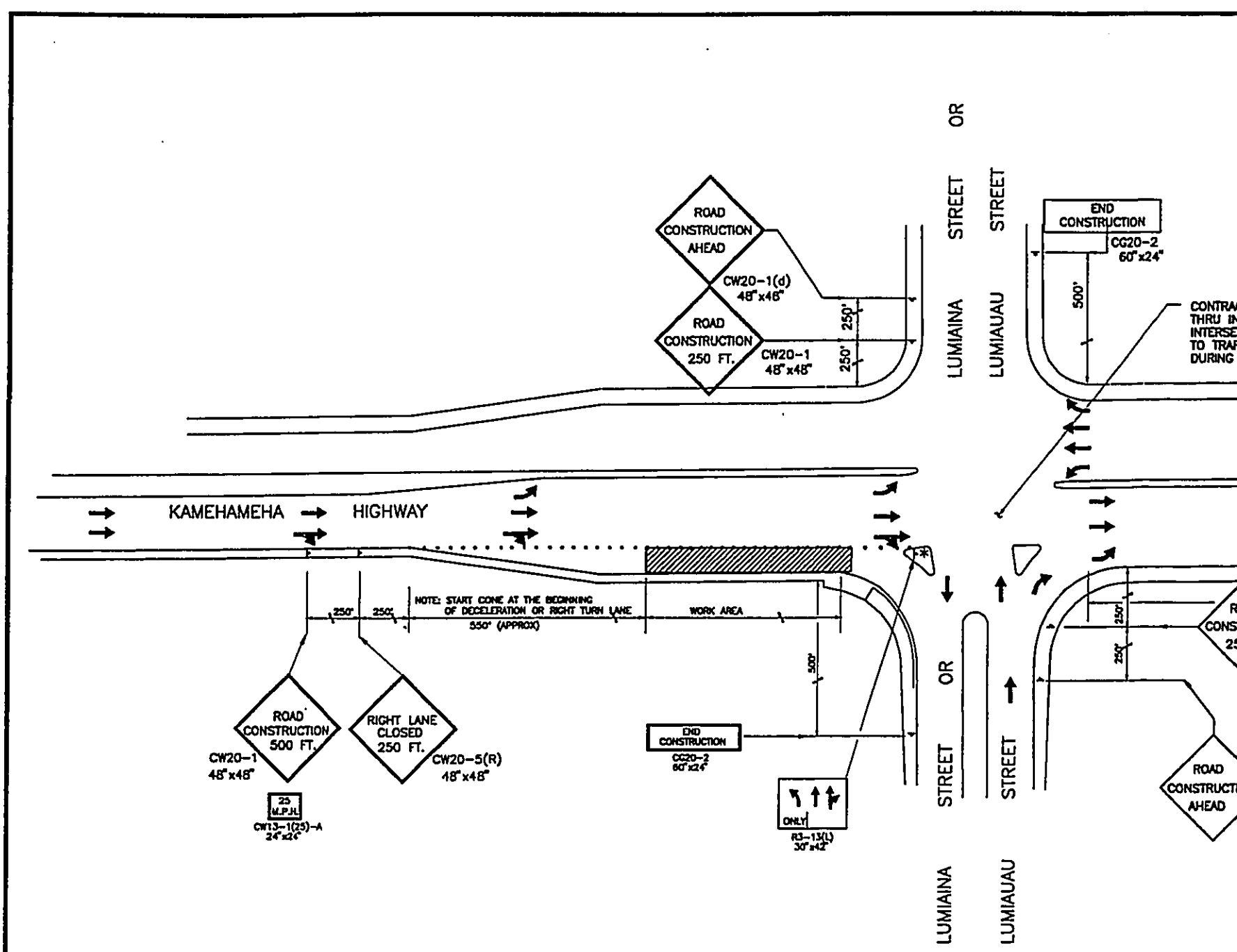
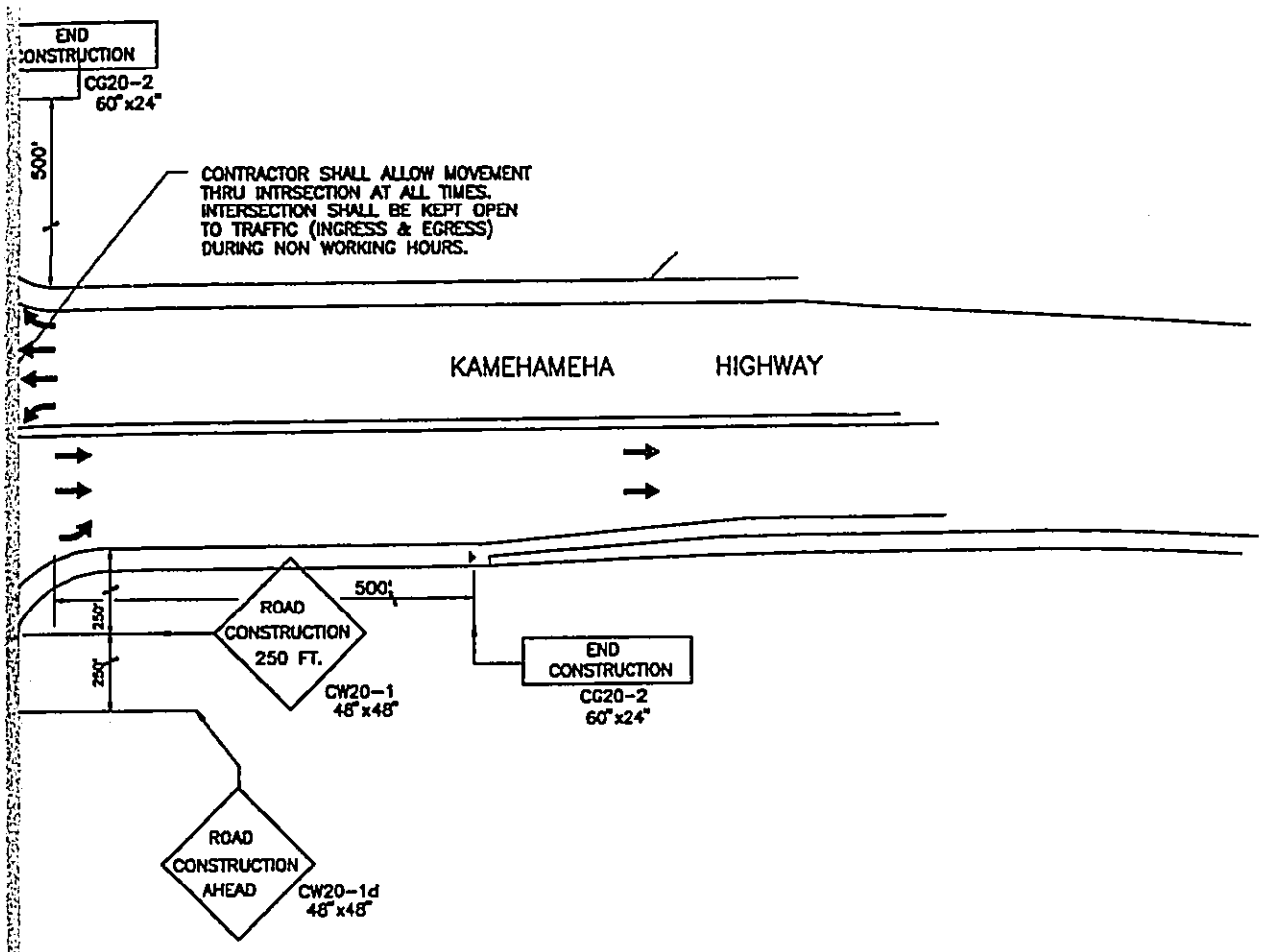


TYPICAL INTERSECTION TRAFFIC CONTROL PLAN –
LANE CLOSURE PRIOR TO INTERSECTION

SCALE: 1"=40'



CONTROL PLAN –
TERSECTION

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGMAN
- FLASHING ARROW SIGNAL
- * POLICE OFFICER TO MONITOR FLOW

Prepared by:
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ALVIN K. ARAKAKI
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HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

C-6

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C
KAMEHEMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE
TRAFFIC CONTROL PLAN -2

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: BS	ENGINEER: HTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO.	SCALE: AS NOTED	SHEET 14 OF _____ SHEETS	

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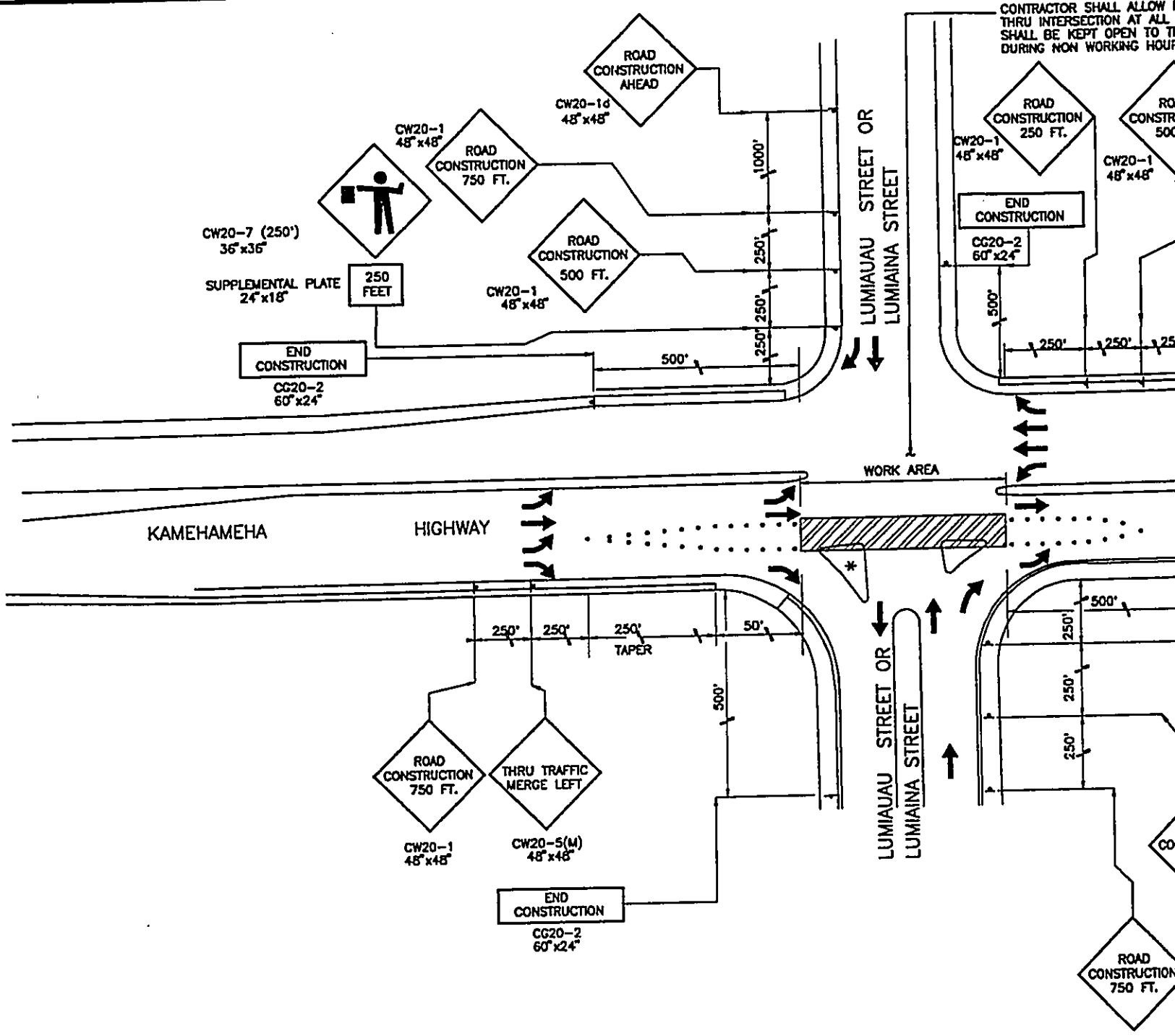
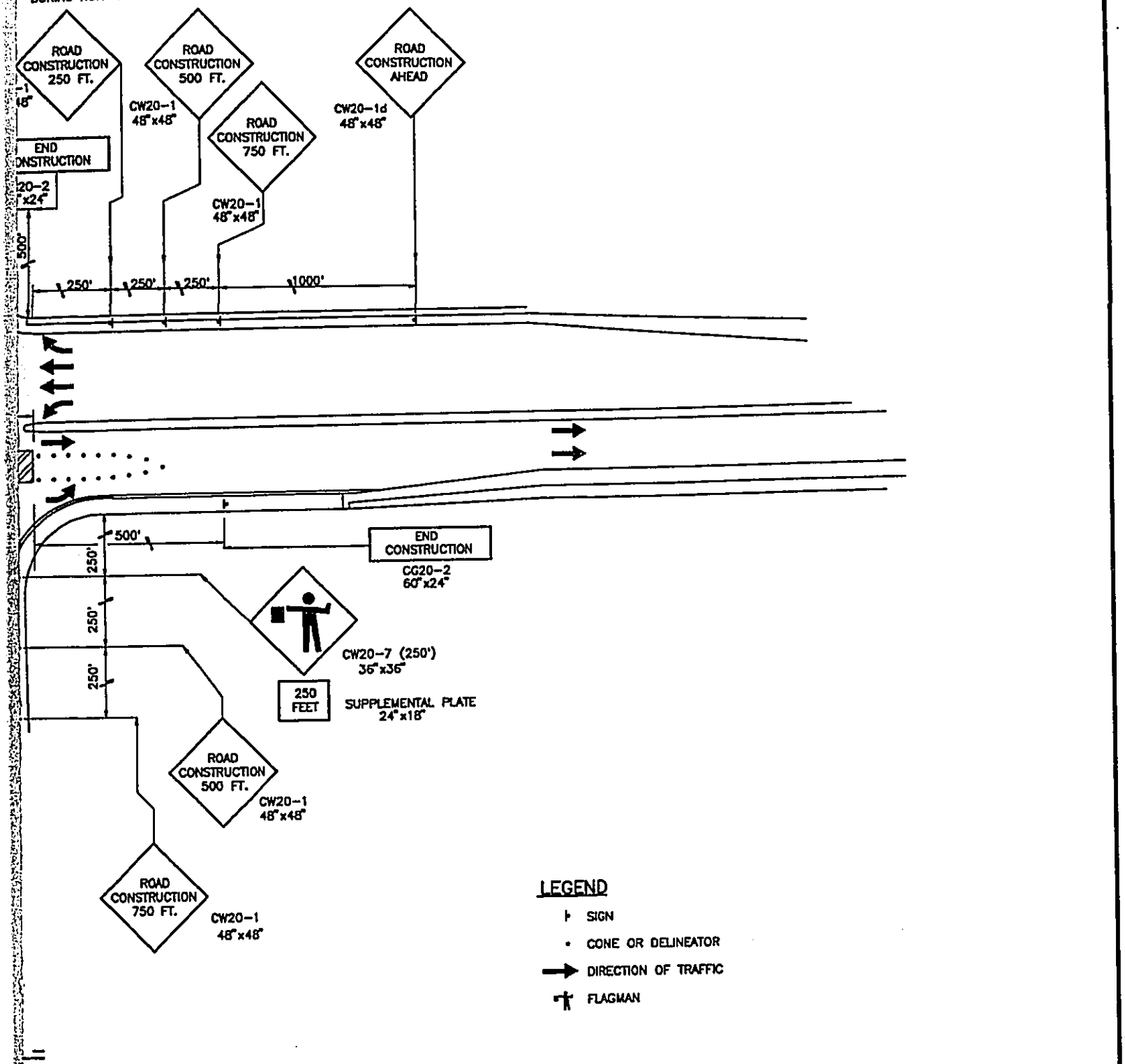


TYPICAL INTERSECTION TRAFFIC CONTROL PLAN –
LANE CLOSURE AT INTERSECTION

SCALE: 1"=40'

CONTRACTOR SHALL ALLOW MOVEMENT
THRU INTERSECTION AT ALL TIMES. INTERSECTION
SHALL BE KEPT OPEN TO TRAFFIC (INGRESS & EGRESS)
DURING NON WORKING HOURS.



LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGMAN

Prepared by:

ASSOCIATES, INC.
Engineers/Architects
841 BISHOP STREET, #1101
HONOLULU, HAWAII 96813
TEL: 521-4711
FAX: 536-2090

C-7

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3021-C
HAWAII, U.S.A.

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE

TRAFFIC CONTROL PLAN – 3

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO.	SCALE: AS NOTED	SHEET ____ OF ____ SHEETS	

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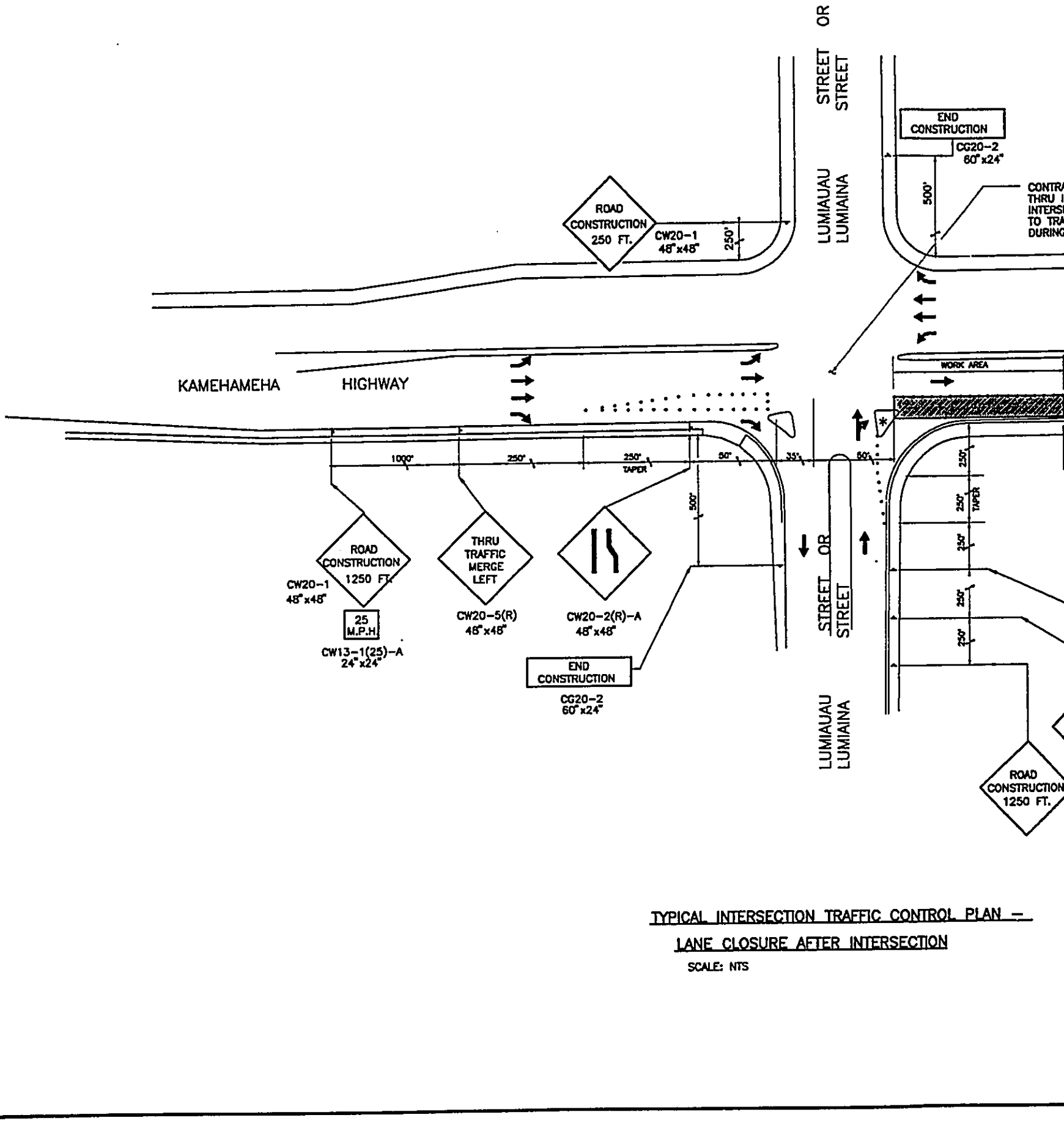
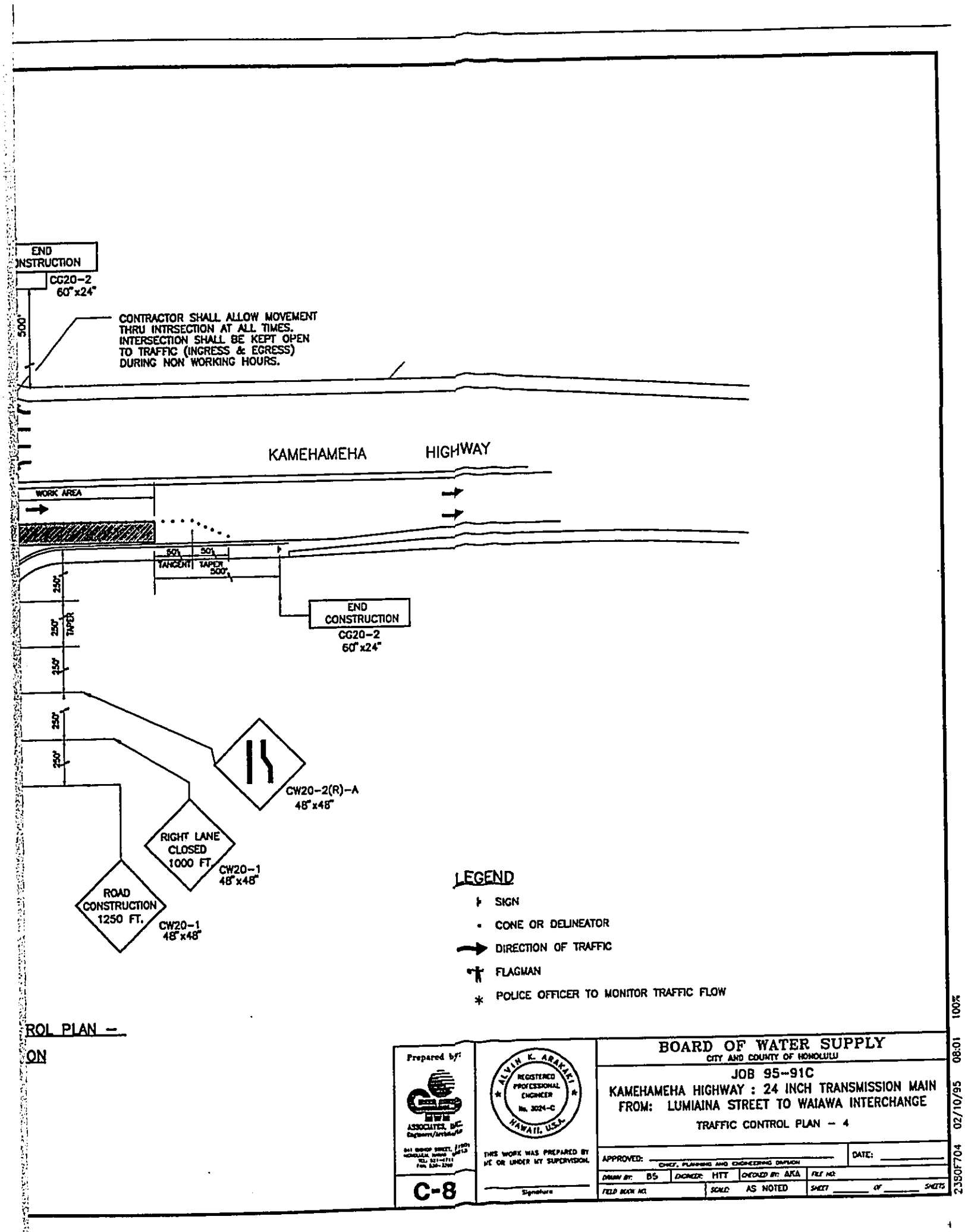


TYPICAL INTERSECTION TRAFFIC CONTROL PLAN – LANE CLOSURE AFTER INTERSECTION

SCALE: NTS



LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGMAN
- * POLICE OFFICER TO MONITOR TRAFFIC FLOW

ROL PLAN –

ON

Prepared by:

ASSOCIATES, INC.

841 BISHOP STREET, SUITE 1201
HONOLULU, HAWAII 96813
TEL: 521-4711
FAX: 524-2090

C-8

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C

KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: LUMIAINA STREET TO WAIAWA INTERCHANGE

TRAFFIC CONTROL PLAN – 4

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

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FIELD BOOK NO.	SCALE: AS NOTED	SHEET _____ OF _____ SHEETS		

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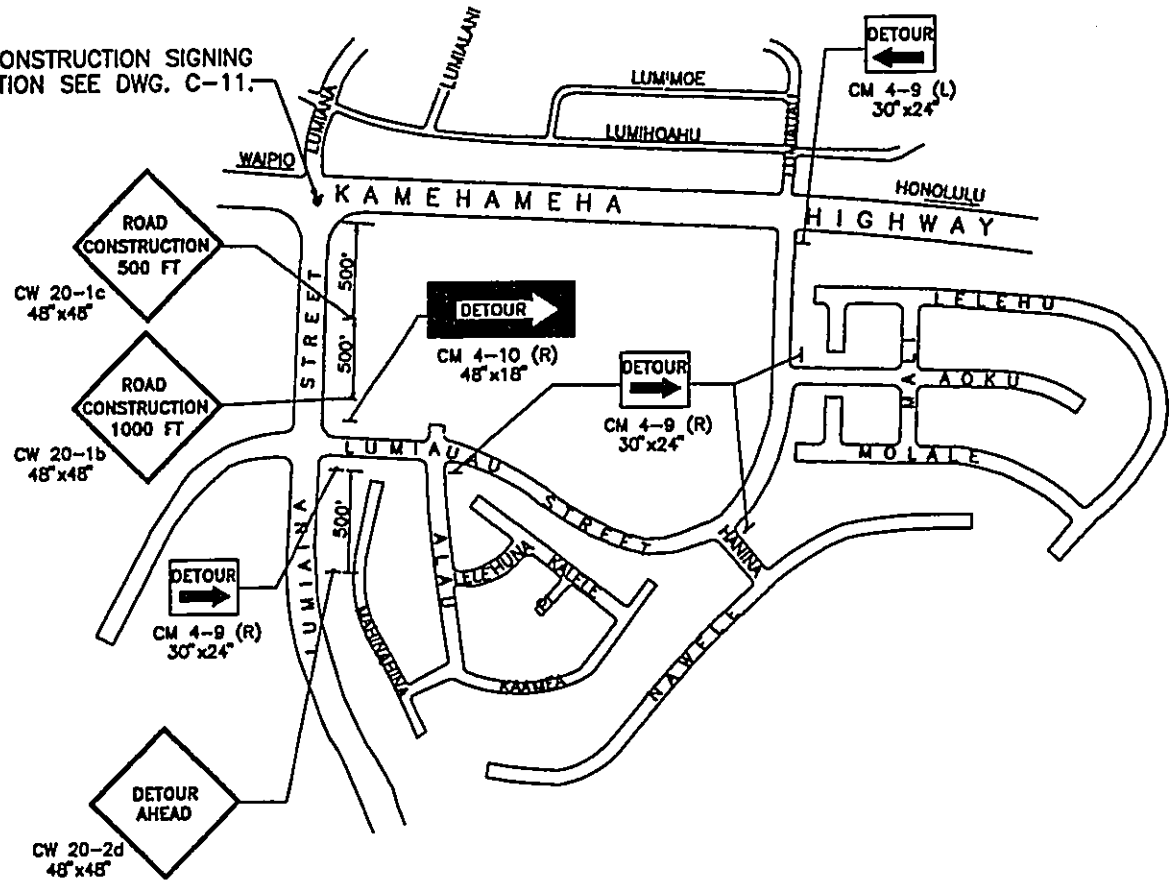
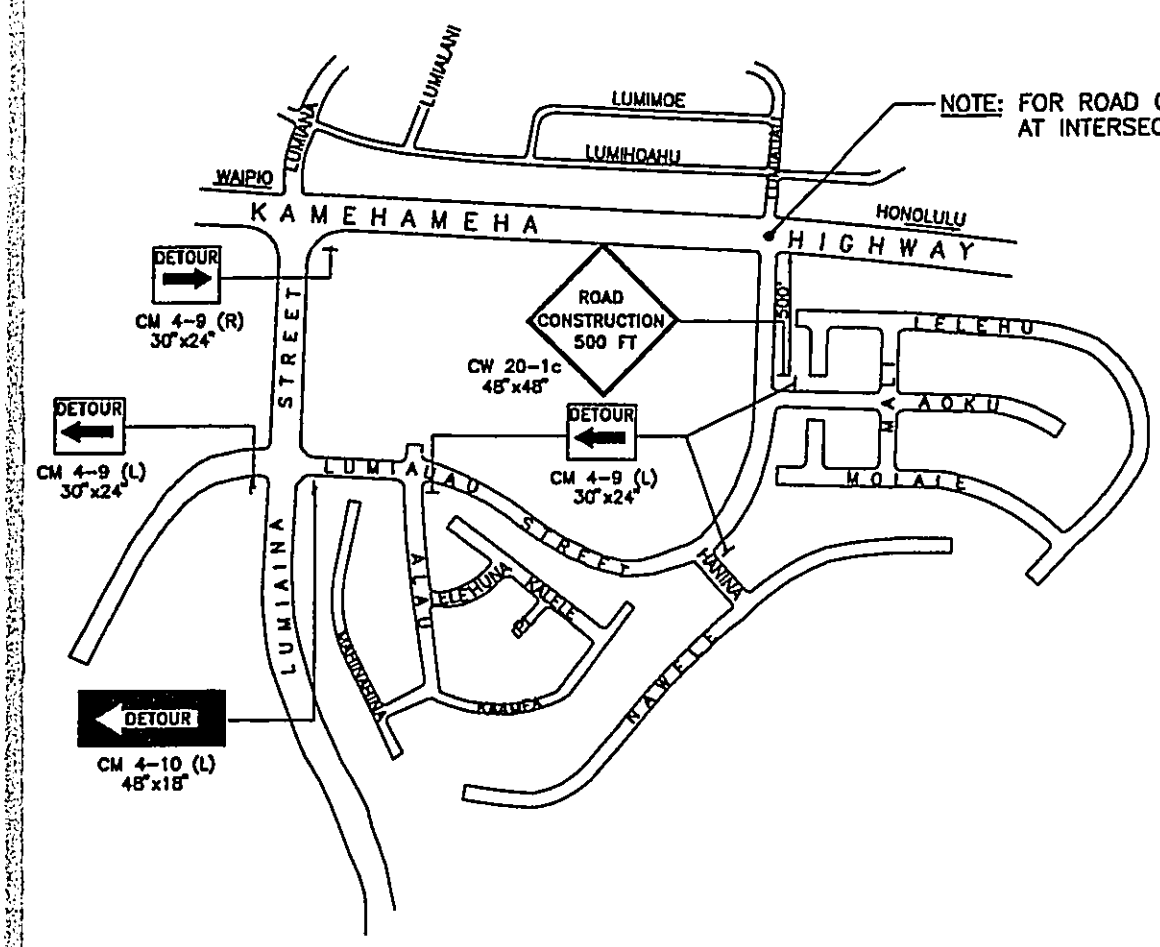
NOTE: FOR ROAD CONSTRUCTION SIGNING AT INTERSECTION SEE DWG. C-11.



LUMIAINA STREET DETOUR PLAN

SCALE: NTS



LUMIAUAU STREET DETOUR PLAN

SCALE: NTS

Prepared by:
EWP ASSOCIATES, INC.
Engineers/Architects
841 BISHOP STREET, #1001
HONOLULU, HAWAII 96813
TEL 521-4711
FAX 524-3089

C-9

ALVIN K. ARAKAKI
REGISTERED PROFESSIONAL ENGINEER
No. 3024-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 95-91C
KAMEHAMEHA HIGHWAY : 24 INCH TRANSMISSION MAIN
FROM: WAIPIO UKA STREET TO WAIAWA INTERCHANGE
DETOUR PLANS

APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION DATE: _____

DRAWN BY: BS	ENGINEER: MTT	CHECKED BY: AKA	FILE NO:
FIELD BOOK NO:	SCALE: AS NOTED	SHEET _____ OF _____ SHEETS	

2380BB1A 02/10/95 14:08 100%

APPENDIX F

COMMENTS AND RESPONSES

EA COMMENTS AND RESPONSES

The following agencies were consulted in the review of the Draft Environmental Assessment for the Waipahu Wells III Station.

ADDRESSEE	DATE COMMENTS RECEIVED
STATE AGENCIES	
Department of Health Environmental Management Division Safe Drinking Water Branch 919 Ala Moana Blvd. Honolulu, HI 96814	January 19, 1995
Department of Health Environmental Management Division Clean Water Branch 919 Ala Moana Blvd. Honolulu, HI 96814	
Department of Land and Natural Resources Commission of Water Resource Management Kalanimoku Building 1151 Punchbowl Street, Room 130 Honolulu, HI 96813	January 25, 1995
Land Use Commission Old Federal Building 3335 Merchant Street, Room 104 Honolulu, HI 96813	January 6, 1995
Office of Environmental Quality Control 220 S. King Street, 4th Floor Honolulu, HI 96813	

ADDRESSEE	DATE COMMENTS RECEIVED
State Historic Preservation Office 33 South King Street, 6th Floor Honolulu, HI 96813	January 20, 1995
Department of Land and Natural Resources Office of Conservation and Environmental Affairs Kalanimoku Building 1151 Punchbowl Street, Room 131 Honolulu, HI 96813	
Department of the Interior U.S. Geological Survey 677 Ala Moana Blvd., Suite 415 Honolulu, HI 96813	
U.S. Department of Agriculture P.O. Box 50004 Honolulu, HI 96850	
Department of Accounting and General Services P.O. Box 119 Honolulu, HI 96810	February 2, 1995
Department of Budget and Finance Housing Finance and Development Corporation 667 Queen Street, Suite 300 Honolulu, HI 96813	
Department of Transportation Highways Division 869 Punchbowl Street Honolulu, HI 96813	February 6, 1995
Senator, Nineteenth Senatorial District State Capitol Honolulu, HI 96813	
Representative, Thirty-Sixth Representative District State Capitol Honolulu, HI 96813	

ADDRESSEE	DATE COMMENTS RECEIVED
CITY AND COUNTY OF HONOLULU AGENCIES	
Department of Land Utilization 650 S. King Street, 7th Floor Honolulu, HI 96813	January 31, 1995
Planning Department 650 S. King Street, 7th Floor Honolulu, HI 96813	January 17, 1995
Department of Wastewater Management 650 S. King Street, 14th Floor Honolulu, HI 96813	
Building Department 650 South King Street Honolulu, HI 96813	
Department of Public Works 650 South King Street Honolulu, HI 96813	
Department of Transportation Services 650 South King Street Honolulu, HI 96813	
Board of Water Supply 630 South Beretania Street Honolulu, HI 96813	
OTHER AGENCIES	
University of Hawaii Geography Department 2424 Maile Way Proteus 443 Honolulu, HI 96822	February 7, 1995
City Council Honolulu City council Honolulu, HI 96813	

ADDRESSEE	DATE COMMENTS RECEIVED

Waipahu Neighborhood Board No. 22
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, HI 96813

All of the comments received have been addressed in the appropriate sections of the Final Environmental Assessment. Copies of the agency's comments and our responses are included in this section.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GMP ASSOCIATES
'95 JAN 24 HAS 51

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

LAWRENCE MIIKE
DIRECTOR OF HEALTH

In reply, please refer to:
EMD /

January 19, 1995

Mr. Michael M. Miyahira, P.E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED WAIPAHU WELLS III STATION, TMK: 9-4-05:74, WAIPAHU, OAHU

Thank you for the opportunity to review and comment on the subject document. We have examined the draft EA and have the following comments:

The Waipahu III wells will serve the Board of Water Supply's Waipahu-Ewa-Waianae system (Public Water System No. 335).

1. All public water system owners and operators are required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, Rules Relating to Potable Water Systems.

2. Section 11-20-29 of Chapter 20 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

3. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses, performed by a laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director upon his review of the information submitted.

If you should have any questions, please contact the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Sincerely,

William Wong

WILLIAM WONG, P.E., Chief
Safe Drinking Water Branch

QT:la

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

JAN 25 1995

Mr. Michael M. Miyahira
GMP Associates, Inc.
841 Bishop Street
Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Draft Environmental Assessment
Waipahu Wells III Station

In review of your Draft EA, we wish to clarify the statement on page 2-3, that the pumps in question will have a permitted use of 3.0 mgd. While the proposed use is 3.0 mgd, the permit process has not yet reached the stage suggested in this statement.

On July 28, 1993, the state Commission on Water Resource Management (CWRM) gave a planning allocation of 5.839 mgd to the Honolulu Board of Water Supply (BWS) from the Waipahu-Waiawa Aquifer System, with the allocation's distributional assignment to wells to be determined through discussions between BWS, U.S. Geological Survey (USGS), and CWRM.

On November 17, 1993, the Commission approved a Well Construction and Pump Installation Permit for Waipahu Wells III, for up to five wells, each with installed pump capacity of 1000 gpm. The permit does not constitute a determination of correlative rights; the quantity to be withdrawn could be reduced in the future; and permitted pump capacity is not guaranteed in the future. The permit states that, upon completion of the well construction and pump installation work, the BWS would declare which portion of the 5.839 mgd allocation was to be assigned to this source. To date, well completion reports for three of the five wells have been received.

On October 19, 1994, the Commission approved a Water Use Permit for 143,500 gpd from this source. The permit is held by the Department of Hawaiian Home Lands, with the condition that the permit be transferred to BWS when BWS assumes control of the wells.

The portion of the BWS' 5.839 mgd allocation from this aquifer system to be assigned to Waipahu Wells III has not yet been determined.

If you have any questions, please call Charley Ice at 587-0251.

Sincerely,

RAE M. LOUI
Deputy Director

CI:ss

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

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

'95 JAN 9 AM 8 48

January 6, 1995

Mr. Michael M. Miyahira, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Draft Environmental Assessment (DEA) for the Waipahu Wells III Station

We have reviewed the DEA for the subject project transmitted with your letter of January 4, 1995. We confirm that the well site, as represented on Figure 3-1, is located within the State Land Use Agricultural District, and that the 24-inch transmission main, as represented on Figure 2-1, is located within both the State Land Use Agricultural and Urban Districts.

We have no other comments to offer at this time. We appreciate the opportunity to comment on this matter.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

Bert Saruwatari

for ESTHER UEDA
Executive Officer

EU:th

cc: OEQC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

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

DEPUTY
GILBERT COLOMA-AGARAN

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

January 20, 1995

Michael M. Miyahira, P. E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

LOG NO: 13623
DOC NO: 9501EJ07

Dear Mr. Miyahira:

SUBJECT: Draft Environmental Assessment (DEA) for the Waipahu Wells III Station
Waipi'o, 'Ewa, O'ahu
TMK: 9-4-05:074

Thank you for the opportunity to review the DEA for the Waipahu Wells III Station. A review of our records shows that there are no known historic sites at the project location. These lands are fallow pineapple fields, where it is unlikely that historic sites will be found. Therefore, we believe that this project will have "no effect" on historic sites.

Sincerely,

Don Hibbard, Administrator
State Historic Preservation Division

EJ:jk

BENJAMIN J. CAYETANO
GOVERNOR

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

EUGENE S. IMAI
COMPTROLLER

MARY PATRICIA WATERHOUSE
DEPUTY COMPTROLLER

LETTER NO. (P)1061.5

FEB 2 1995

'95 FEB 3 AM 9 36

Mr. Michael M. Miyahira
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Waipahu Wells III Station
Waipio, Oahu, Hawaii
Draft Environmental Assessment

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

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

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RY:jk

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
SAM CALLEJO

IN REPLY REFER TO:

STP 8.6583

RECEIVED
GMP ASSOCIATES, INC.
'95 FEB 9 AM 9 34

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

February 6, 1995

Mr. Michael M. Miyahira, P. E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Draft Environmental Assessment (DEA)
Waipahu Wells III Station

Thank you for your letter of January 4, 1995, requesting our comments on the subject DEA.

The proposed project is not anticipated to have a significant impact on our State transportation facilities. However, plans for any construction work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

JEREMY HARRIS
MAYOR

Patrick T. Onishi
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

95-00056(DT)

January 31, 1995

Mr. Michael M. Miyahira, P.E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Draft Environmental Assessment (EA)
Waipahu Wells III Station
Tax Map Key: 9-4-5: 74

Thank you for the opportunity to review the Board of Water Supply's proposal to install five 1,000-gallon-per-minute pumps, a 0.1 million-gallon overflow storage reservoir, control building, transmission main, Bailey pressure-reducing valve, access road, landscaping, fencing, irrigation system, electrical equipment and appurtenances. The proposals are classified as a Utility Installation, Type B in the Land Use Ordinance. Therefore, a Conditional Use Permit (CUP), Type 1, must be obtained from our department. Enclosed is a copy of the DLU Master Application Form and instruction sheet for filing a CUP application.

The project area is located in the State Agricultural District. A State Special Use Permit is not required as the proposals are considered a permissible use within the agricultural district under Chapter 205-4.5 (a)(7), Hawaii Revised Statutes.

Should you have any questions regarding the CUP and SUP, please call our Zoning District Changes Branch at 523-4299.

Very truly yours,

PATRICK T. ONISHI
Director of Land Utilization

PTO:dt
Enclosures

95-00056.djt

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF LAND UTILIZATION
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

DLU MASTER APPLICATION FORM

Additional data, drawing/plans, and fee requirements are listed on a separate sheet titled "Instructions for Filing." *PLEASE ASK FOR THESE INSTRUCTIONS.*

All specified materials and fees must accompany this form; incomplete applications could delay processing. You are encouraged to consult with department staff in completing the application. Please call the appropriate phone number given in the "Instructions for Filing" sheet.
Please print legibly or type the required information.

PERMIT REQUESTED (Check one or more as appropriate):

Clusters:
- ☐ Agricultural Cluster
- ☐ Cluster Housing
- ☐ Country Cluster

Conditional Use Permits:
- ☐ Type 1 ☐ Type 2

- ☐ Existing Use
- ☐ Flood Hazard Variance
- ☐ Park Dedication
- ☐ Plan Review Use
- ☐ Planned Development-Housing
- ☐ Shoreline Setback Variance
- ☐ Site Plan Review
- ☐ Site Development Plan
- ☐ Special District: _____ (Indicate District)
- ☐ Special Management Area Permit/Assessment
- ☐ State Special Use Permit
- ☐ Subdivision
- ☐ Sunlight Reflection
- ☐ Variance from LUO Sec.(s): _____
- ☐ Waiver (public uses/utilities)
- ☐ Zero Lot Line
- ☐ Zone Change, From _____ to _____
- ☐ Zoning Adjustment, LUO Sec.(s): _____

TAX MAP KEY(S): _____
LOT AREA: _____
ZONING DISTRICT: _____ **STATE LAND USE DISTRICT:** _____

STREET ADDRESS/LOCATION OF PROPERTY: _____

RECORDED FEE OWNER:
Name _____
Mailing Address _____
_____
Phone Number _____
Signature _____

APPLICANT:
Name _____
Mailing Address _____
_____
Phone Number _____
Signature _____

PRESENT USE OF PROPERTY/BUILDING: _____
_____
_____

AUTHORIZED AGENT/CONTACT PERSON:
Name _____
Mailing Address _____
_____
Phone Number _____

PROJECT NAME (if any): _____
_____

PROJECT PROPOSAL (Briefly des
_____
_____
_____
_____
_____

FOR DEPARTM
Submitted Fo
Date Appli
Date of

THIS COPY, WI

The above approval does n

DLU-190-56 (REV. 2/87)

CORRECTION

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

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF LAND UTILIZATION
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

DLU MASTER APPLICATION FORM

Additional data, drawing/plans, and fee requirements are listed on a separate sheet titled "Instructions for Filing." *PLEASE ASK FOR THESE INSTRUCTIONS.*

All specified materials and fees must accompany this form; incomplete applications could delay processing. You are encouraged to consult with department staff in completing the application. Please call the appropriate phone number given in the "Instructions for Filing" sheet.
Please print legibly or type the required information.

PERMIT REQUESTED (Check one or more as appropriate):

Clusters:
- ☐ Agricultural Cluster
- ☐ Cluster Housing
- ☐ Country Cluster

Conditional Use Permits:
- ☐ Type 1 ☐ Type 2
- ☐ Existing Use
- ☐ Flood Hazard Variance
- ☐ Park Dedication
- ☐ Plan Review Use
- ☐ Planned Development-Housing
- ☐ Shoreline Setback Variance
- ☐ Site Plan Review
- ☐ Site Development Plan
- ☐ Special District: _____ (Indicate District)
- ☐ Special Management Area Permit/Assessment
- ☐ State Special Use Permit
- ☐ Subdivision
- ☐ Sunlight Reflection
- ☐ Variance from LUO Sec.(s): _____
- ☐ Waiver (public uses/utilities)
- ☐ Zero Lot Line
- ☐ Zone Change, From _____ to _____
- ☐ Zoning Adjustment, LUO Sec.(s): _____

TAX MAP KEY(S): _____
LOT AREA: _____
ZONING DISTRICT: _____ **STATE LAND USE DISTRICT:** _____

STREET ADDRESS/LOCATION OF PROPERTY: _____

RECORDED FEE OWNER:
Name _____
Mailing Address _____
Phone Number _____
Signature _____

APPLICANT:
Name _____
Mailing Address _____
Phone Number _____
Signature _____

PRESENT USE OF PROPERTY/BUILDING: _____

PROJECT NAME (if any): _____

AUTHORIZED AGENT/CONTACT PERSON:
Name _____
Mailing Address _____
Phone Number _____
Signature _____

PROJECT PROPOSAL (Briefly describe the proposed activity or project): _____

FILE NO. _____

FOR DEPARTMENT USE ONLY
Submitted Fee Amount: $ _____
Date Application Accepted: _____ Accepted By: _____
Date of Public Hearing: _____
- ☐ Approved
- ☐ Approved with conditions indicated below.
- ☐ Denied for reason(s) given below.
- ☐ Exempt project.

THIS COPY, WHEN SIGNED BELOW, IS NOTIFICATION OF THE ACTION TAKEN.

_____ _____ _____
Signature Title Date

The above approval does not constitute approval of any other required permits, such as building permits.

City and County of Honolulu
Department of Land Utilization

Instructions for Filing a
CONDITIONAL USE PERMIT, TYPE 1 (CUP-1) Application
LUO Sections 4.40, 8.30-5.

With your completed application form, please submit:

1. Written Information

   a. Indicate section(s) of the Land Use Ordinance (LUO) which provide for the proposed conditional use.

   b. Indicate how the site is suitable for the proposed use, considering site location, topography, infrastructure and natural features.

   c. Indicate the proposed use will not alter the character of the surrounding area in a manner substantially limiting, impairing, or precluding the use of the surrounding properties for the principal uses presented in the underlying zoning district. Also indicate how the use at the proposed location will provide a service or facility which will contribute to the general welfare of the community-at-large or surrounding neighborhood.

   d. If the use is proposed on leased land, a copy of the lease agreement must be submitted.

   Note: A developer, owner or lessee (holding a recorded lease for the property, the unexpired term of which is more than 5 years from the date of filing of the application) may file an application for a CUP-1 provided the use is permitted in the district

2. Drawings/Plans

   Three copies of accurate scale drawings of the land parcel(s) and any adjacent land affected by the proposal, showing, when pertinent, easements, slope, and all existing and proposed locations of structures, streets, property lines, uses, driveways, pedestrian walks, off-street parking and loading spaces, yards (front, side, and rear), and landscaped areas.

3. Fees

   $100. Fees are payable to the Director of Finance, and are not refundable.

(over)

4. Additional Notes

a. RECORDED FEE OWNER is the person or corporate entity that owns the land in fee simple.

APPLICANT is the person or entity proposing the action. It may be the recorded fee owner or a lessee.

AUTHORIZED AGENT is the person who is processing the permit(s). This is the person that the Department will contact for additional information. Again, it may be the same person as the recorded fee owner, or the applicant. The authorized agent may also be the project architect or contractor. For government agencies, the authorized agent is the contact person for the project.

If you are filing as an agent, supply the information for the owner and applicant and submit a letter authorizing you to act as an agent.

b. To avoid errors or delays, supply all the required information. Fill out all blanks on the application form clearly, concisely, completely, and sign the application.

c. For information on how to complete your application, please call the Zoning District Change Branch, at 523-4299.

d. If your project proposal requests multiple Department of Land Utilization (DLU) permits, (e.g., Conditional Use Permit and Special Management Area Use Permit), call the Land Use Coordination Division at 523-4254 for information on the sequencing of permits.

e. The Director, where applicable, will consider traffic flow and control; access to and circulation within the property; off-street parking and loading; sewerage; drainage and flooding; refuse and service areas; utilities; screening and buffering; signs; setbacks; yards and other open spaces; lot dimensions; height; bulk and location of structures; location of all proposed uses; hours and manner of operation; noise, lights, dust, odor and fumes.

f. Before submission of an application for a Conditional Use Permit, the applicant is encouraged to notify the neighborhood board in whose district the project is to be located. For information regarding the appropriate neighborhood board to contact, call the Neighborhood Commission at 523-4087.

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

CHERYL D. SOON
ACTING CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

RS 1/95-0014

January 17, 1995

Mr. Michael M. Miyahira, P.E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Draft Environmental Assessment for
the Waipahu Wells III Station

Thank you for giving us the opportunity to review the Draft Environmental Assessment (EA) for the Waipahu Wells III Station.

The Central Oahu Development Plan Public Facilities Map (DPPFM) shows a symbol for the Waipahu Wells III Station. That amendment reflected the project as a non-potable water source. However, the EA implies that the well will provide a potable water source. This needs to be clarified.

Page 3-1 indicates that the Development Plan Land Use designation is AG-1. This is incorrect as AG-1 is a zoning designation. Figure 3-2 is a zoning, not a Development Plan Land Use map. The title of Figure 3-2 should be changed. The Development Plan Land Use designation for the site is Agriculture. A Development Plan Land Use map for the area should be included.

Page 5-2 mentions that the site may have been selected in part due to water quality data based on nearby wells. Our understanding is that exploratory wells were drilled at the site to determine the water quality since the site was previously used for sugarcane and may have been exposed to pesticides which may have contaminated the water supply. It would be helpful

if the findings of that study were provided to show the feasibility of the project. A discussion of the water quality and any mitigating measures necessary would be helpful.

Thank you for your cooperation in this matter.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Acting Chief Planning Officer

CDS:lh

PLANNING DEPARTMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED
GMP ASSOCIATES, INC.
'95 FEB 10 AM 10

JEREMY HARRIS
MAYOR

CHERYL D. SOON
ACTING CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

RS 1/95-0014

February 9, 1995

Mr. Michael M. Miyahira, P.E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Draft Environmental Assessment (DEA)
for the Waipahu Wells III Station

Please refer to our correspondence dated January 17, 1995. Contrary to what was indicated in our previous response to the Draft Environmental Assessment, the Waipahu Wells III Station is designated on the Central Oahu Development Plan Public Facilities Map (DPPFM) as a potable water source. The other comments in the letter remain valid and applicable.

Thank you for your cooperation in this matter.

Sincerely,

CHERYL D. SOON
Acting Chief Planning Officer

ENGINEERING DIVISION TEL No.808-527-6195 Feb 7,95 15:01 No.007 P.01

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

FACSINILE COVER LETTER

PAGES TRANSMITTED: 4
(INCLUDING COVER SHEET)

DATE: 2/7/95

TO: COMPANY: GMP
ATTENTION: TEP
FAX NO.: 538-3269

FROM: ANDY
PLANNING AND ENGINEERING DIVISION
FAX NO. (808) 527-6195

SUBJECT: WAIPAHU WELLS

REMARKS:

IN CASE OF TRANSMISSION PROBLEMS, PLEASE CONTACT SENDER AT (808) 527-5279. THANK YOU.

"Pure Water . . . man's greatest need – use it wisely

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (000) 956-3980

February 7, 1995
EA:0102

Mr. Andy Okada
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Okada:

Draft Environmental Assessment
Waipahu Wells III Station
Waipahu, Oahu

The proposed project involves installation of five 1000 gpm pumps, a 0.1 million gallon overflow storage reservoir, a control building, and a transmission main. The five pumps, which should yield a total pump capacity of 7.5 mgd, will supplement the potable water supply for the increasing populations in Waipahu, Waipio, and Kapolei.

We have reviewed the Draft Environmental Assessment (EA) with the assistance of Dave Penn, Geography; and Paul Berkowitz of the Environmental Center.

Conflict of Interest

It seems highly inappropriate for an approving agency to review their own application! The inherent conflict of interest removes much of the incentive to draft an effective environmental assessment.

Sustainable Yield

Any proposal to remove groundwater from an aquifer should contain some discussion of the aquifer's sustainable yield. How much water can be taken from the aquifer without adversely affecting the quantity and quality of groundwater available for future use? This Draft EA fails to discuss sustainable yield altogether. Thus it is difficult to evaluate the impacts of this project on future groundwater availability.

This document also fails to mention how the proposed wells relate to the network of existing wells in the region. The impact of the five new pumps needs to be examined in conjunction with other existing wells, current pumping levels, and sustainable yield figures.

If regional demand exceeds sustainable yield, then salt water intrusion may occur, making the water brackish and nonpotable.

In short, given the lack of information presented, it is impossible to determine if the proposed project will result in significant environmental effects, as stipulated by Section 11-200-12 of the Hawaii Administrative Rules. However, the project clearly has the potential to impose significant impacts in at least three areas: (1) "detrimentally affects air or water quality," (2) "involves a substantial degradation of environmnetal quality," and (3) "curtails the range of beneficial uses of the environment." Thus, pusuant to Section 343-5(b), an EIS "shall be required if the agency finds that the proposed action may have a significant effect on the environment."

Water Quality

The chronology presented in the Draft EA seems somewhat vague. Section 2 discusses potential actions to take after drilling test wells and evaluating the water quality results, while Appendix A indicates that the test wells have already been drilled.

Since it appears that the test wells have been drilled, water quality data should be presented. Rather than hinting at the need for Granular Activated Carbon (GAC) water treatment units, this need should be either confirmed or rejected. Furthermore, in order to monitor water quality in the future, baseline data for the aquifer ought to be provided.

Excess Capacity

The five pumps have a total maximum pump capacity of 7.5 mgd, while the Commission on Water Resource Management has authorized a permitted use of only 3 mgd. Why does pump capacity exceed permitted use by two-and-a-half times? This seems to go well beyond normal excess capacity reserves.

Water Allocation

Generally applicants must complete the *Hawaii Revised Statutes* Chapter 343 process before water use permits are issued. Have the permits been issued to the landowner or to the Board of Water Supply (BWS)? What are the total planned uses by all users? What are the total planned uses by the BWS? The developer's contribution to developing this water source should be explicitly stated. What commitments has the BWS made to developers? These are important questions in evaluating how the proposed project

conforms to the Hawaii Water Plan.

To allow others to more fully understand this project, the water use permit appications should be appended to this Draft EA.

On August 16, 1994, the Department of Hawaiian Home Lands (DHHL) filed an application for a water use permit from Waipahu Wells III (well nos. 2400-09 to 13). The DHHL intends to use this water to supply the municipal needs of the Princess Kahanu Estates. The intentions of the DHHL are noticeably absent from the statement on future water allocation. Have the DHHL applications been considered, and what is their status?

Incomplete Data

Appendix A provides data for only four of the five proposed wells. Also only one of the five wells has an attached Well Completion Report. Where is the rest of the data?

Conclusion

The applicant's justification for a Negative Declaration is based on largely irrelevant issues. Since the proposed project basically involves groundwater uptake, the principle environmental concern should be the impact on the quantity and quality of groundwater available from the aquifer. This Draft EA conspicuously fails to discuss this issue! Therefore we recommend that these concerns be addressed before the project is approved. To ignore the impacts on the aquifer, especially at a time when aquifer withdrawals are at or near their sustainable limits, is simply unacceptable.

Sincerely,

John Harrison
Environmental Coordinator

cc: OEQC
GMP Associates, Inc.
Roger Fujioka
David Penn
Paul Berkowitz

ASSOCIATES, INC.

February 10, 1995

Engineers/Architects

Dr. John T. Harrison
Environmental Coordinator
Environmental Center, Crawford 317
University of Hawaii
2250 Campus Road
Honolulu, Hawaii 96822

Re: Draft Environmental Assessment
for the Waipahu Wells III Station

Dear Mr. Harrison:

Thank you for your February 7, 1995 comments on the subject project. Our response to your comments is as follows:

Conflict of Interest

According to Section 343-5, HRS, "For Agency Actions, the agency proposing the action is responsible for preparing an environmental assessment, reviewing the document, submitting the document to OEQC for publication, and issuing a Notice of Determination. A Notice of Determination is a letter which accompanies an environmental assessment stating that the action will either have no significant impact, resulting in the issuance of a Negative Declaration or may have a significant impact resulting in the issuance of a Environmental Impact Statement Preparation Notice. In essence, with Negative Declarations, the proposing and accepting authority are one and the same".

Sustainable Yield

On July 28, 1993, the State Commission on Water Resource Management (CWRM) gave a planning allocation of 5.839 million gallons per day (mgd) to the Honolulu Board of Water Supply from the Waipahu-Waiawa Aquifer System, with the allocation's distributional assignment to wells to be determined through discussions between BWS, U.S. Geological Survey, and CWRM.

The allocation of 5.839 mgd was decided upon after evaluating the sustainable yield of the Waipahu-Waiawa Aquifer System. Therefore, the proposed withdrawal amount of 3.0 mgd at the Waipahu Wells III Station is within the allocated amount.

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We do not believe that a discussion of the network of existing wells in the region is necessary. The impact of the five new wells on other existing wells, reservoirs, and tramsmission mains has already been hydraulically analyzed by the BWS through their master plans.

Water Quality

Water quality data has been added to the Final EA in Appendix E.

Granular Activated Carbon (GAC) water treatment units have been added to the Final EA.

The Board of Water Supply periodically samples its wells for NIPDWR parameters and retains the information as baseline data.

Excess Capacity

To clarify your understanding, the Commission on Water Resource Management has not authorized a permitted use of 3.0 mgd yet. The amount of 3.0 mgd is the proposed use.

The five pumps have a total maximum capacity of 7.5 mgd, however not all of the pumps will be operating at once. Three pumps are needed to attain 3.0 mgd. The remaining pumps are backup units in case of breakdowns or periodic maintenance.

Water Allocation

As stated earlier in this letter, the water allocation issue for this project has been mostly resolved, the only remaining question being the distribution of this amount among the area wells being developed. The allocation decision by CWRM has already taken into consideration the potential impacts on the sustainable yield of the affected aquifer and the potential water quality impacts. In addition, all decisions of the CWRM follow the Hawaii Water Plan. Finally, the BWS has previously identified major planned uses for their Leeward system water through their periodically updated master plans. Thus, the impacts of their proposed developments on their existing system infrastructure have already been evaluated by these documents, and by any accompanying environmental assessments or environmental impact statements.

Copies of the water use permits are in Appendix D.

On October 19, 1994, the Commission approved a Water Use Permit for 143,500 gpd from the Waipahu Wells III Station. The permit is held by the Department of Hawaiian Home

Lands, with the condition that the permit be transferred to BWS when BWS assumes control of the wells.

Incomplete Data

Appendix A now includes data, including the Well Completion Report, for all five of the wells.

Conclusion

The quantity of groundwater available from the affected aquifer has been studied by the BWS and the CWRM, thereby resulting in the BWS allocation of 5.839 mgd. The quality of the groundwater has made it necessary to install GAC treatment units. The proposed project is expected to supplement the current BWS system in Leeward Oahu.

We appreciate your input on this project.

Sincerely,
GMP ASSOCIATES, INC.

Michael M. Miyahira, P.E.
Environmental Engineer

GMP ASSOCIATES, INC.

Engineers/Architects

February 10, 1995

Cheryl D. Soon, Acting Chief Planning Officer
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment
for the Waipahu Wells III Station

Dear Ms. Soon:

Thank you for your January 17, 1995 comments on the subject project. Our response to your comments is as follows:

1. A discussion with Lin Wong at the Planning Department resulted in the removal of the reference to the project as a non-potable source. The Planning Department has issued a new letter of response dated February 9, 1995 stating that Waipahu Wells III is designated as a potable water source.

2. The title of Figure 3-2 has been changed to read "City and County Zoning Map". In addition, a Development Plan Land Use map has been included in the Final EA.

3. Water quality results from the Board of Water Supply have been included in the Appendix. The GAC treatment units are being provided to treat well water contaminants.

We appreciate your input on this project.

Sincerely,
GMP ASSOCIATES, INC.

Michael M. Miyahira, P.E.
Environmental Engineer

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GMP ASSOCIATES, INC.

Engineers/Architects

February 10, 1995

Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
Kalanimoku Building
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment
for the Waipahu Wells III Station

Dear Mr. Loui:

Thank you for your January 25, 1995 comments on the subject project. Our response to your comments is as follows:

1. We have clarified the statement on page 2-3 of the Final EA to read "proposed use of 3.0 mgd" instead of "permitted use of 3.0 mgd".

2. The Final EA has been revised to include the planning allocation of 5.839 mgd to the Honolulu Board of Water Supply (BWS) from the Waipahu-Waiawa Aquifer System.

3. The Final EA has been revised to include the Water Use Permit held by the Department of Hawaiian Home Lands for 143,500 gpd from the Waipahu Wells III Station.

We appreciate your input on this project.

Sincerely,
GMP ASSOCIATES, INC.

Michael M. Miyahira, P.E.
Environmental Engineer

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GMP ASSOCIATES, INC.

February 10, 1995

Engineers/Architects

William Wong, Chief
State of Hawaii
Environmental Management Division
Department of Health
Safe Drinking Water Branch
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

Re: Draft Environmental Assessment
for the Waipahu Wells III Station

Dear Mr. Wong:

Thank you for your January 19, 1995 comments on the subject project. An engineering report for new potable water sources, which addresses the requirements set in Section 11-20-29, will be submitted to the DOH as soon as possible.

We appreciate your input on this project.

Sincerely,
GMP ASSOCIATES, INC.

Michael M. Miyahira, P.E.
Environmental Engineer

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GMP ASSOCIATES, INC.

Engineers/Architects

February 10, 1995

Patrick T. Onishi
City and County of Honolulu
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment
for the Waipahu Wells III Station

Dear Mr. Onishi:

Thank you for your January 31, 1995 comments on the subject project. Our response to your comments is as follows:

1. A Conditional Use Permit, Type 1 application will be submitted to the DLU.

2. We agree that a State Special Use Permit is not required as the project proposals are considered a permissible use within the agricultural district under Chapter 205-4.5 (a) (7), Hawaii Revised Statutes.

We appreciate your input on this project.

Sincerely,
GMP ASSOCIATES, INC.

Michael M. Miyahira, P.E.
Environmental Engineer