



EXECUTIVE CHAMBERS
HONOLULU

GEORGE R. ARIYOSHI
GOVERNOR

April 2, 1979

MEMORANDUM

To: Mr. Donald A. Bremner, Chairman
Environmental Quality Commission

Subject: Revised Environmental Impact Statement for Pump, Controls,
and Appurtenances, Hana Water System, Hana, Maui

Based upon the recommendation of the Office of Environmental Quality Control, I am pleased to accept the subject document as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding whether or not the action described therein should or should not be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws, and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the proposing agency to weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and, together with the comments made by reviewers, provide a useful analysis of alternatives to the proposed action.


George R. Ariyoshi

cc: Honorable Susumu Ono
Mr. Richard O'Connell

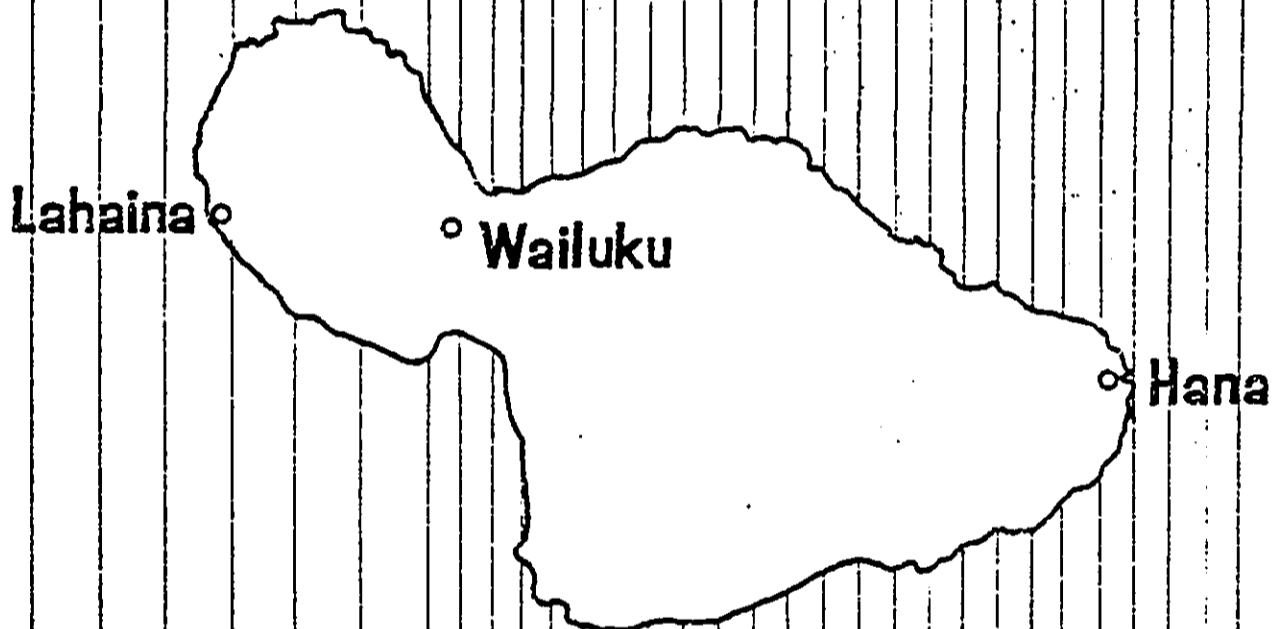


Office of Environmental Quality Control
Office of the Governor

550 Halekiauwa Street
Tani Office Building, Third Floor
Honolulu, Hawaii 96813

PUMP, CONTROLS, & APPURTENANCES

REVISED ENVIRONMENTAL IMPACT STATEMENT



HANA WATER SYSTEM

Island of Maui

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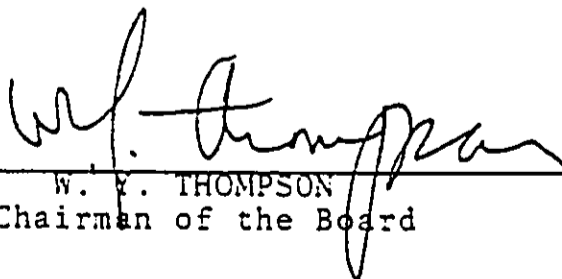
Job No. 35-MW-31
PUMP, CONTROLS AND APPURTENANCES
HANA WATER PROJECT
HANA, MAUI

REVISED
ENVIRONMENTAL IMPACT STATEMENT

Prepared by:

Division of Water and Land Development
Department of Land and Natural Resources

November 1978



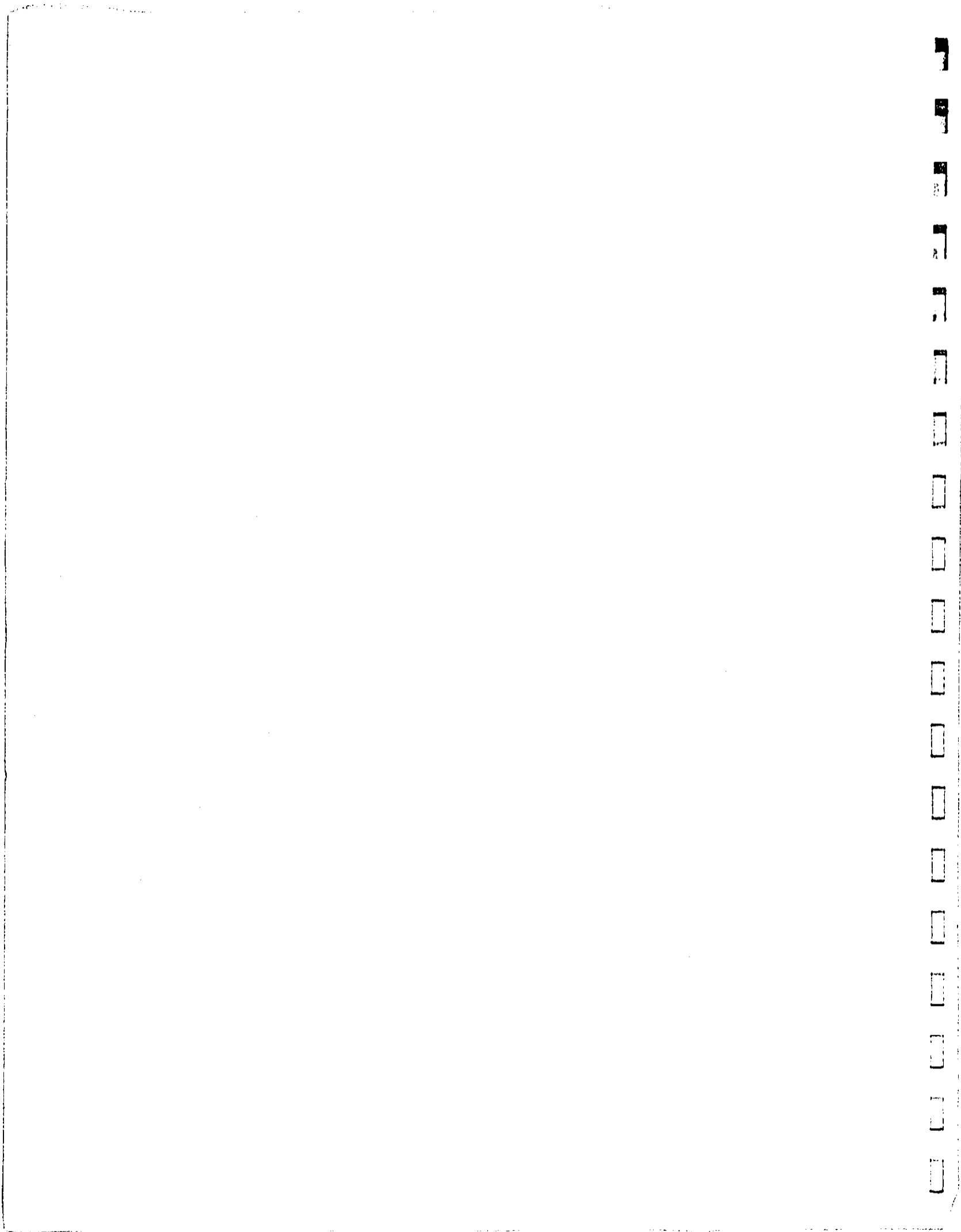
W. Y. THOMPSON
Chairman of the Board

REVISED: FEBRUARY 1979

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86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	i
PROJECT DESCRIPTION	1
THE ENVIRONMENTAL SETTING	1
Location and Reference Landmarks	1
Hana Town and Economy	1
Water System	2
Historic Sites	3
Surface Physical Features	3
Geology and Hydrology	3
Hana Well "A"	4
RELATIONSHIP OF THE ACTION TO LAND USE PLANS, POLICIES AND CONTROLS	5
THE PROBABLE IMPACT OF THE ACTION AND MITIGATION MEASURES	5
UNAVOIDABLE ADVERSE EFFECTS	6
ALTERNATIVES	7
Different Site	7
Treating Surface Water	7
Conversion of Brackish or Sea Water	7
No Action or Postponement	8
SHORT-TERM USES AND LONG-TERM PRODUCTIVITY	8
IRREVERSIBLE COMMITMENT OF RESOURCES	9
APPROVALS REQUIRED	9
APPENDIX A - PARTIES CONSULTED AND COMMENTS	A-1
APPENDIX B - HANA WELL "A", AN ACCOUNT OF WELL DEVELOPMENT	B-1
APPENDIX C - COST ESTIMATES	C-1



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
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87
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90
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92
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94
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100

LIST OF FIGURES

<u>Figure</u>	<u>Description</u>
1	State Land Use Districts (Project Site)
2	Schematic Diagram of the Existing Hana Water System
3	"Existing Distribution System" and "Proposed Distribution System"
4	Annual Water Consumption and Number of Service Connections and Annual Rainfall - Hana, Maui
5	Annual Consumption per Service Connection and Annual Rainfall
6	Area IV Water Budget, Nahiku-Hana Subarea Water Budget

SUMMARY

Project Proposal: Install a pump in an existing well (Hana Well "A") in Wakiu, Hana, Maui, and provide the necessary controls, connections and appurtenances to integrate the proposed facility into the Hana Water System.

Purpose, Objective, and Goal: The proposed pump will serve as a backup to an existing pumped source (Hana Well "B") with installation planned for completion during 1979. Engineered controls will provide for automatic operation of the system, but will preclude simultaneous pumping of wells "A" and "B". The facility will enhance the Hana Water System, and eventually enable the County to eliminate surface water as a source for Hana, and also aid in meeting the County goal of providing safe drinking water to Hana residents.

The Environment: Hana is located at the eastern tip of Maui about 55 road miles from Wailuku. Much of the connecting roadway is narrow and winding, adding to the sense of isolation for Hana. An airport provides transportation facilities to augment the highway. Hana Town is a rural community clustered around Hana Bay. The Hana Water System spans eight miles between Wainapanapa Cave and Wailua Stream Intake. Before 1977 the Wailua Intake was the sole County water source. High rainfall, lush vegetation and gently sloping lands are characteristics of the area.

Probable Impacts: Construction effects will be minor since the work will be performed at an existing paved site at least 1,000 feet removed from the nearest home.

The town of Hana eventually can be served exclusively from groundwater sources upon completion of this project and other distribution system improvements. Simultaneous pumping of both wells may lead to increased salinity levels for both wells. Well "A" is designed and will be operated as a backup, and not as an increase in source capacity.

The enhancement of the water system may lead to some growth, but no large scale increase in population is expected unless a change in the economic base occurs. The physical separation from Wailuku, County policies and the attitude of the residents in opposition to growth are believed to be more important controlling factors (than water system improvements) in maintaining the present life-style of Hana.

Alternatives: Possible alternatives to the project (installing a pumping in an existing well) include the following:

1. Drilling a new well and installing a pump.
2. Treating surface water.

3. Conversion of brackish/sea water.
4. No action.
5. Postponement of action.

The first three alternatives are more costly and would require more clearing, excavation and grading than the proposed project. The project is being considered for implementation now because the sole groundwater source (Hana Well "B") for the isolated and remote Hana Water System should have a standby for breakdown and maintenance periods.

PROJECT DESCRIPTION

The site is shown on Figure 1, "State Land Use Districts". The proposed improvement is one step in a continuing effort to meet the Maui County Department of Water Supply goal of providing potable water to the domestic consumers of Maui, in compliance with the Federal Safe Drinking Water Act and the State Department of Health Drinking Water Standards.

The project objective is to connect an existing well (Hana Well "A") to the County water system in Hana in 1979. A 200-gallons-per-minute (GPM) pump, controls, chlorinator and appurtenances will be installed to develop the groundwater in Hana Well "A", located in Wakiu. The completed facilities will augment water output from an existing pump in Hana Well "B", also located in Wakiu. A mutual backup capability provided by Wells "A" and "B" assures a dependable supply of clean groundwater for Hana and provides the Department of Water Supply some flexibility in eliminating surface water from Wailua Stream as a supply source. A schematic diagram of the existing system (Figure 2) shows the relative location of the proposed facilities which are to be installed at Well "A".

This project is funded through Act 218, Session Laws Hawaii 1974, Item K-26, and Act 195, Session Laws Hawaii 1975, Item A-11. The preliminary estimate of cost is \$100,000. The completed facility will be operated and maintained by the Maui Department of Water Supply.

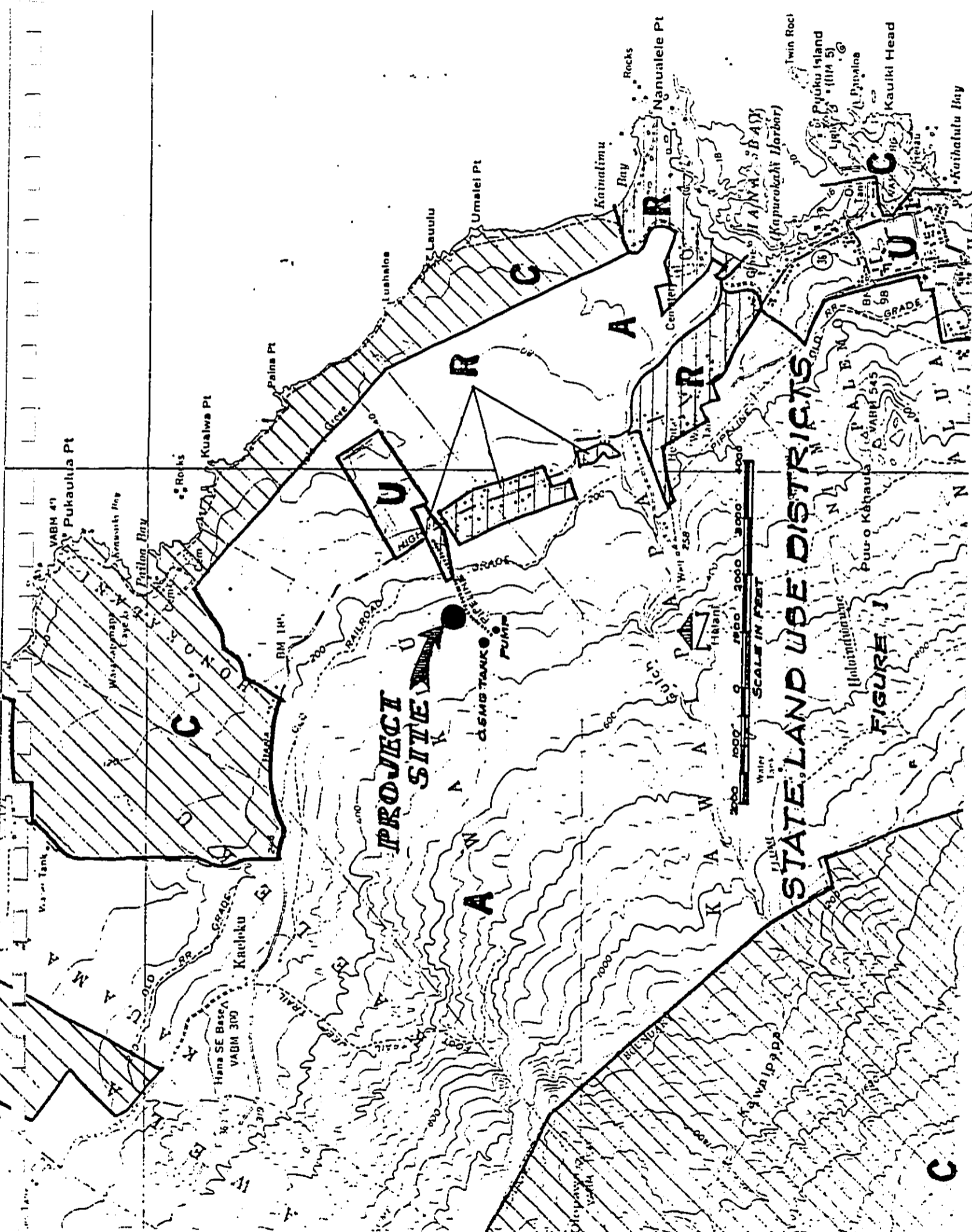
THE ENVIRONMENTAL SETTING

Location and Reference Landmarks

The project is located near the eastern tip of Maui, at the base of Haleakala Volcano, 0.9 miles from the ocean, 1.5 miles northwest of Hana Bay, and 1.5 miles southeast of Hana Airport (see Figure 1). The site is adjacent to a former (now abandoned) papaya field within State lands with a State Land Use designation of agriculture (A). Ground elevation is 265 feet.

Hana Town and Economy

Hana town is essentially a rural community clustered around Hana Bay. Hana district has an airport, a hotel, ranchlands, farms, spectacular shorelines, lava fields and other attractions. The economy is based on agriculture with much of the usable lands devoted to pasture, with some banana and papaya production. Hana Ranch Co. is the largest single private landowner in the area. The County of Maui "believes the lifestyle of Hana and its surroundings should remain unchanged..." and that "...the improvement of the water supply and delivery system for Hana is solely for agricultural purposes and for the permanent residents of Hana."⁴



STATE LAND USE DISTRICTS

FIGURE 1

Transportation facilities include the Hana Highway and Hana airport. Flights to Hana are available through Royal Hawaiian Air Service. Hana town is more than 50 road miles from Kahului Airport, but judging by the traffic, many visitors are willing to drive the distance and even continue beyond Hana to the Seven Sacred Pools near Kipahulu.

The number of tourists to Hana is difficult to ascertain because many are day visitors. Hana presently has 89 hotel units to accommodate overnight guests. Assuming that occupancy rates are between 50% and 75%, the 89 units probably host 90 to 135 guests per day. Hotel Hana Maui with 61 units, is by far the largest resort establishment.

Hana does not have a public system to collect or treat sewage, and of the 353 housing units reported in 1970, about a third lacked "all or some plumbing". The water system covers an extensive geographical area with small distribution mains.

Water System

The Hana Water System stretches for eight miles between the State Park at Wainapanapa caves and the surface water intake at Wailua Stream (Figure 2). Wailua Stream was the sole public water source for the Hana system prior to 1977. The resident population of about 1,000 uses an average of 101,000 gallons of water each day. Figure 4 shows the general increase in water consumption and number of service connections as reported in the Maui BWS annual reports between 1957 and 1977. Figure 5 is a plot of the average daily water consumption per service connection for the years between '57 and '77 obtained as follows:

$$\frac{\text{Annual water consumption for the Hana System}}{\text{No. of service connection} \times 365(\text{days per year})} = \begin{array}{l} \text{Gallons} \\ \text{per day} \\ \text{per service} \\ \text{connection} \end{array}$$

This latter quotient has also been generally increasing, perhaps with a rise in the standard of living, but at least some of this increase may be attributable to the lower rainfall in recent years, as indicated on the accompanying plot of annual rainfall records for Hana airport.

Figure 3 is a reproduction of the existing and proposed distribution systems from the Water Master Plan³. The report also lists a program for phasing the proposed improvements. The "Adopted Design Criteria" for the report expects a "maximum development" for Hana of 454 urban acres supporting a projected population of 6,410 with a water demand of 1.63 mgd. The study assumed a density of 13 persons per acre over 289.7 acres (3766 persons) for residential use, and an apartment use density of 40 persons per acre over 66.1 acres (2644 persons). The sum of the

SCHEMATIC DIAGRAM OF THE
EXISTING HANA WATER SYSTEM

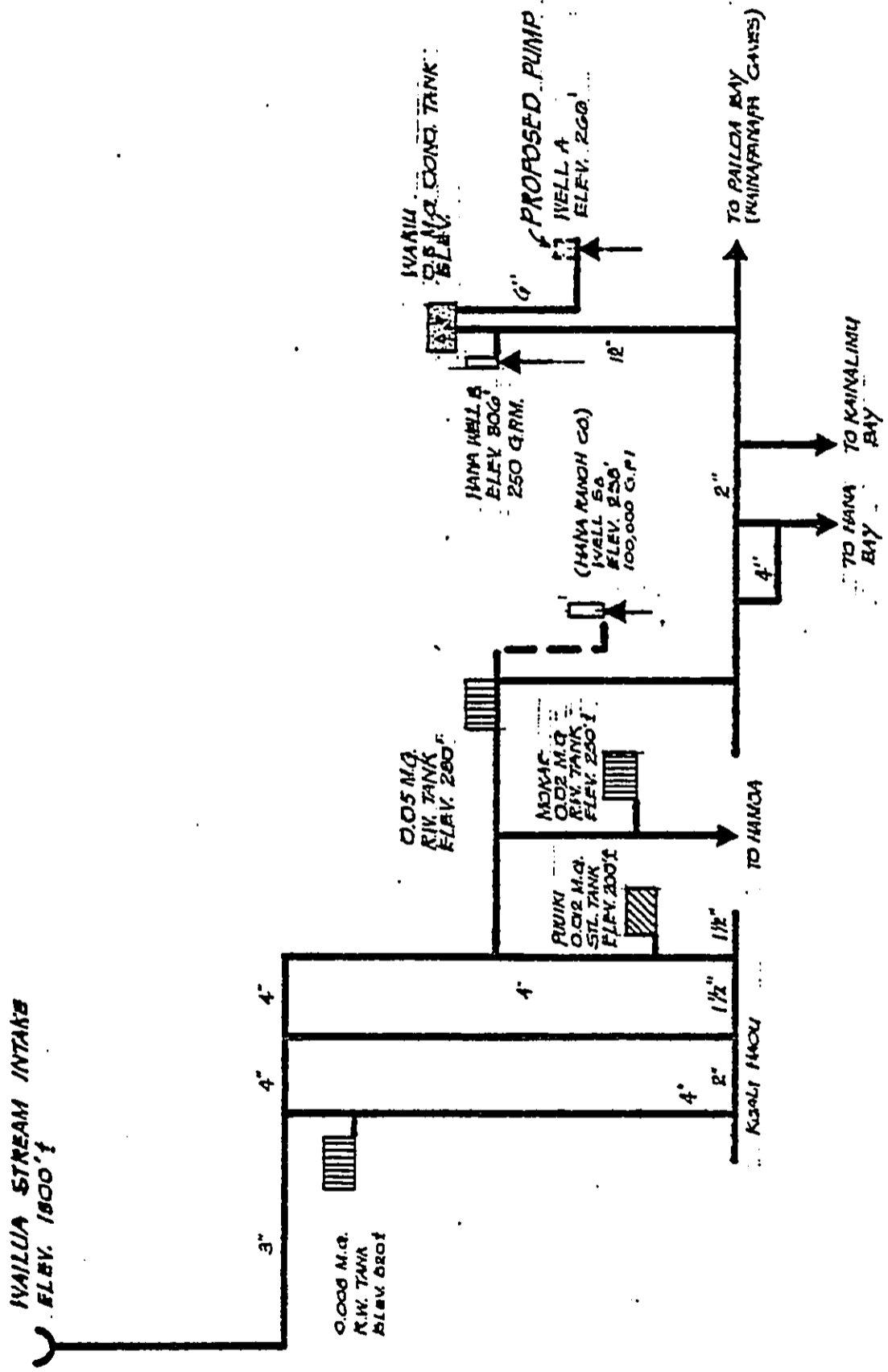


FIGURE 2

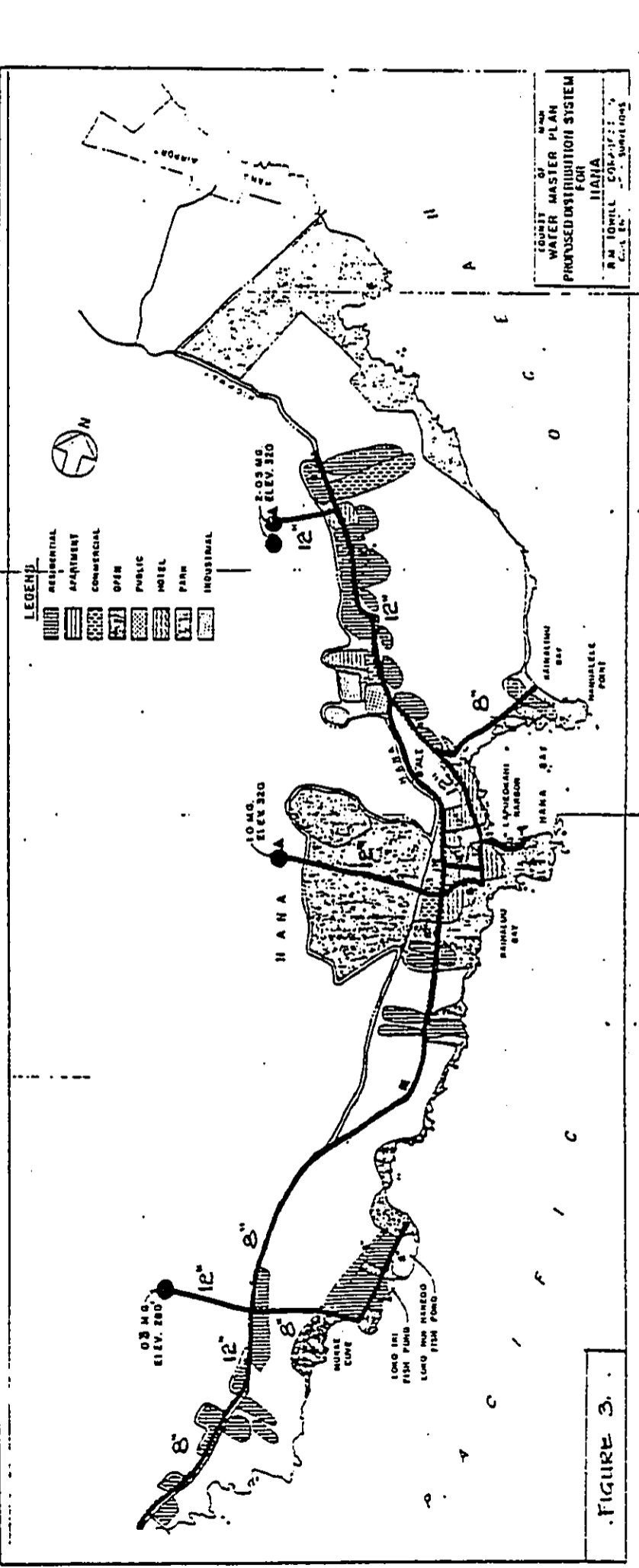
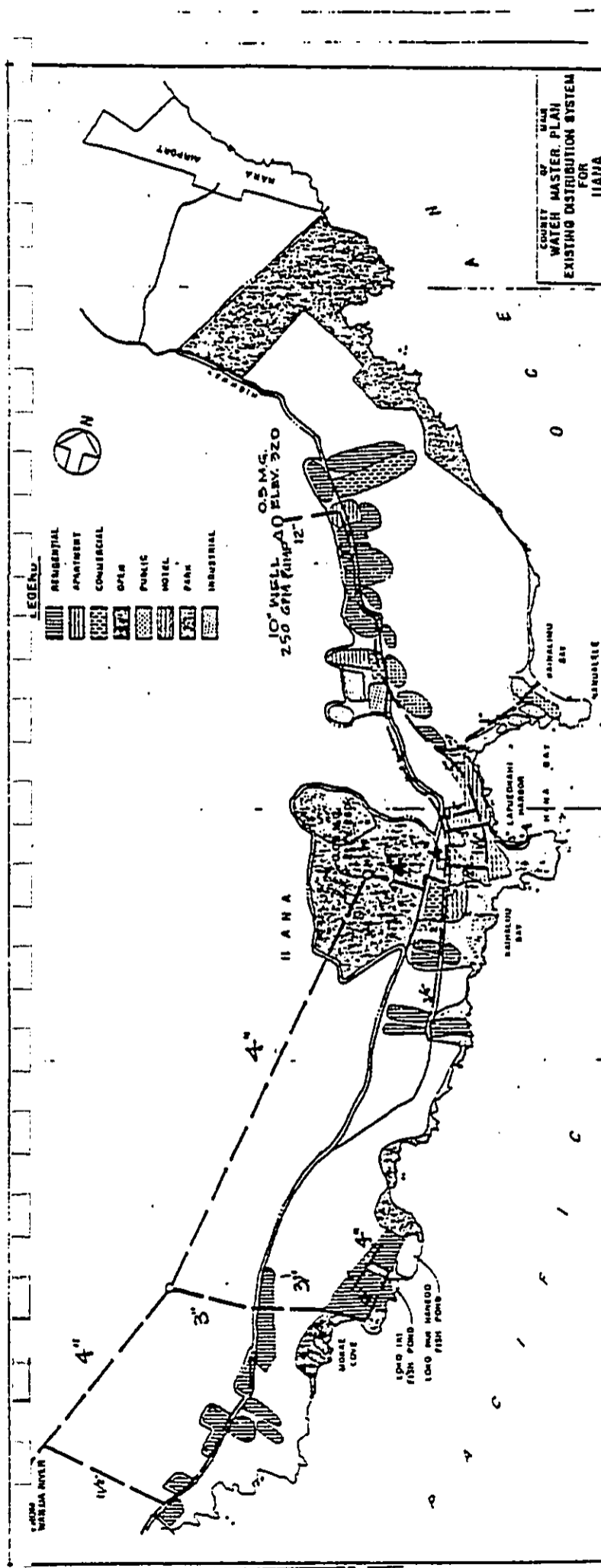
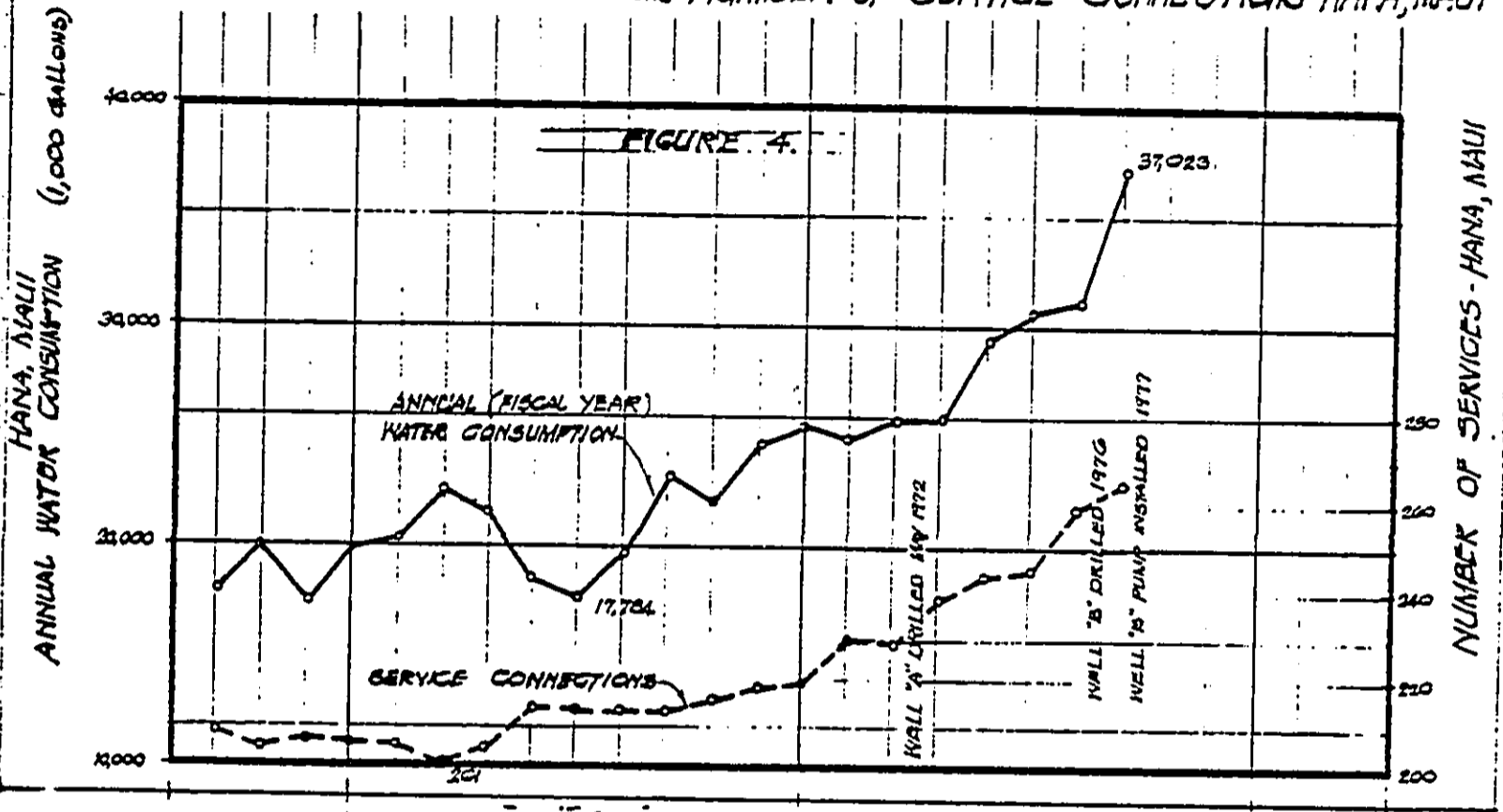
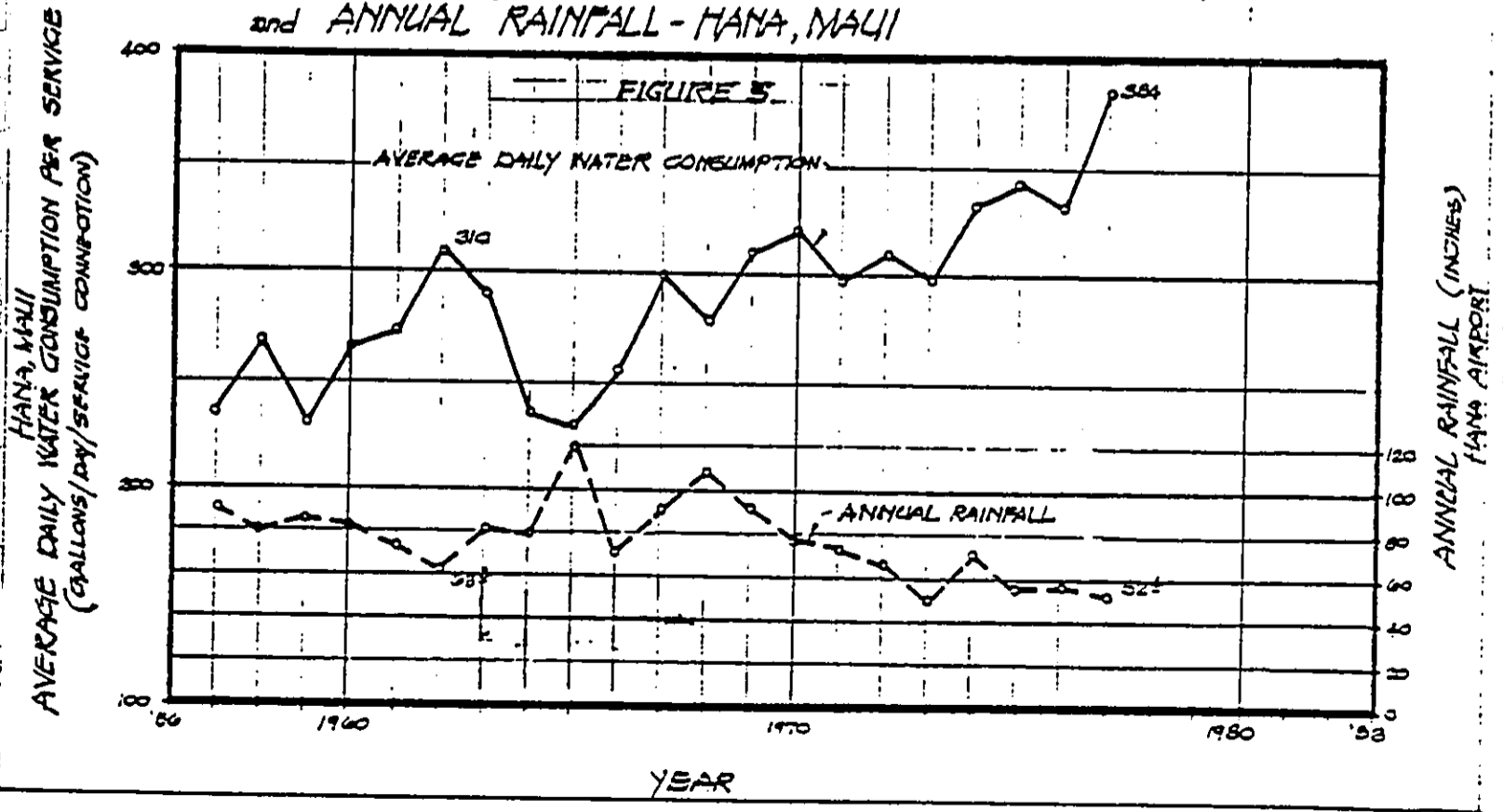


FIGURE 3.

ANNUAL WATER CONSUMPTION and NUMBER of SERVICE CONNECTIONS - HANA, MAUI



AVERAGE DAILY CONSUMPTION PER SERVICE CONNECTION and ANNUAL RAINFALL - HANA, MAUI



density-acreage products yields 6410 persons. The figures were generated for planning purposes, to determine future water system needs if growth occurs as assumed. The present mood of the County does not appear to favor such development.

Historic Sites

Hana is rich in historic sites, but the Maui Historical Society has noted (in a response to the Preparation Notice) that "the closest area of historical interest would be the Wainapanapa Complex located in the State Park" which is more than 5,500' due north of the project site.

Surface Physical Features

Topography and Rainfall: Land slope is a gradual 10% to the sea. Annual rainfall of about 75 inches a year provides ample moisture to support excellent vegetative cover.

Vegetation and Animal Life: Typical natural vegetation would include californian grass, guava, hala, kukui, ohia, and treefern¹. Existence of a "Game Bird Range"² within the coastal conservation district suggests that introduced fowl are established in the Hana area, although the species would be restricted to those which could tolerate fairly wet conditions. The endangered bird habitats are generally above elevation 2,000', well above the project site elevation of 266'.

Soil: The Malama series soil is on rough aa lava flows and is so permeable that most of the rainfall percolates to rocks below. The soil is unflatteringly referred to as "Malama extremely stony muck" by the Soil Conservation Service¹.

Geology and Hydrology

Geology: Hana Well "A" is located on the north edge of the east rift of Haleakala (East Maui) Volcano. Three series of lavas can be distinguished in parts of east Maui. The oldest unit, the Honomanu Volcanic Series (the chief basal aquifer in Hana), consists of highly permeable thin-bedded, basaltic pahoehoe and aa which freely yield ground water to wells.⁵ The Kula Volcanic Series lies over the Honomanu Series and consists of thicker-bedded, poorly permeable andesitic aa lava flows, and is not a significant aquifer.

Deep canyons were formed in the East Maui Volcano during a long period of inactivity which followed the Kula Series. Basalts, basaltic andesites and andesites issued forth in rapid succession along the southwest and east rifts of the Haleakala Volcano after the long quiescent period⁶. The Hana Series lavas partly filled the deep canyons and veneered most of Haleakala,

except the northwest face. Rocks of this Hana Volcanic Series are so permeable that most of the rainfall infiltrates to the subsurface. Except during storms, very little precipitation runs off as surface discharge to the sea.

Hydrology: The Hawaii Water Resources Regional Study (HWRRS) "Surface and Ground Water Resources" study element report⁷ delineates Area IV of the Maui subregion as a rough triangle with apexes at Haleakala Crater, Kailua Town and Hana Town (Figure 6). The report lists the rainfall and disposition of rainfall as follows for Area IV:

Rainfall	- 925 mgd
Evapotranspiration	- 145 mgd
Exported Out of Area	- 160 mgd
Surface Runoff	- <u>150 mgd</u>

Groundwater Recharge 470 mgd

The portion of Area IV west of Nahiku Village has surface rocks of low permeability; hence surface runoff is high and streams are perennial. The exported water originates in this sub-area. East of Nahiku, surface permeability is high and most of the rainfall percolates to lower rocks. This portion represents about one-third of the total surface of Area IV. An estimate of groundwater recharge was made for the subarea (east of Nahiku) based on the guide for estimating groundwater flow as suggested in the HWRRS report:

1. Rainfall is about one-third of the total Area IV rainfall, or 296 mgd
2. Runoff is 25% of rainfall or - 74 mgd
3. Evapotranspiration is 15% of rainfall or - 44 mgd

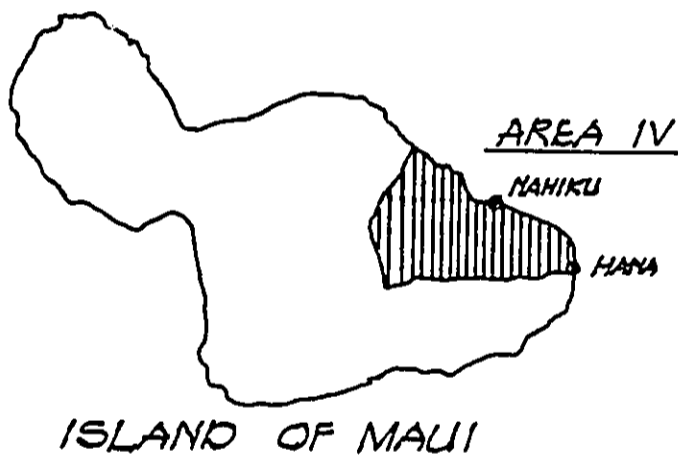
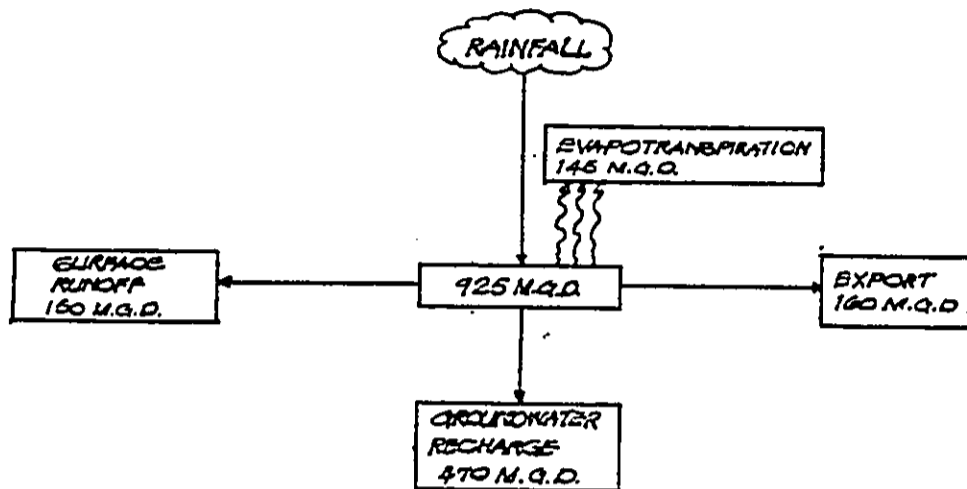
Groundwater recharge is then 178 mgd

Further assuming a uniform distribution of groundwater flow across the ten miles of shoreline between Nahiku and Hana Bay, the average groundwater flux is 17.8 mgd across each mile of shoreline. Following the same reasoning, the groundwater flux is about 46 mgd between the 2.6 miles from Wainapanapa Cave to Hana Bay. The installed pump capacity between Wainapanapa Cave and Hana Bay is less than 1 mgd. The installation and use of a 200 gpm (0.3 mgd) pump in Hana Well "A" represents less than 1% of the estimated groundwater recharge, and will not significantly affect the basal groundwater in this area. The effect of simultaneous pumping of Wells "A" and "B" is discussed in a later section.

Hana Well "A"

Well "A" is a 10-inch cased well with ground elevation at 266', drilled to basal groundwater. The water level in the well fluctuates with the ocean tide, although a lag of

AREA IV (HALEAKALA-KAILUA-HANA TRIANGLE)
WATER BUDGET



NAHIKU-HANA SUB-AREA
WATER BUDGET

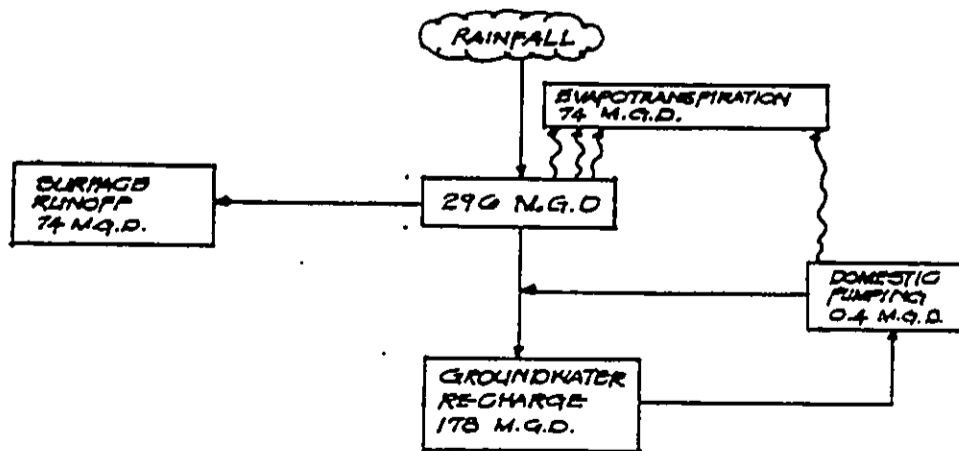


FIGURE 6

about three hours is apparent. When pumped during August 29 and September 1, 1977, at rates between 200 and 250 gpm, the initial drawdown was about 0.3 feet; and the well level thereafter fluctuated between 0.3 ft. to 2.4 ft. msl as the ocean ranged from 0.2 ft. to 2.0 ft. msl. The maximum chloride content was 190 parts per million. A recommendation to install a 200 gpm pump in Well "A" was made on the basis of the test results. Data from this test, and information obtained from the drilling logs, as well as a short history of Well "A" is included in Appendix B.

Well "A" is located at an enclosed Maui BWS site with a transmission main ready for connection to the existing system. A control building and paved areas are also part of the existing site improvements.

RELATIONSHIP OF THE ACTION TO LAND USE PLANS, POLICIES AND CONTROLS

The installation of a pump and the utilization of Well "A" as a water source is a permitted use under State Land Use Regulations and the Maui County CZO for the agricultural district.

THE PROBABLE IMPACT OF THE ACTION AND MITIGATION MEASURES

Construction effects will be almost nil since the site is already paved and fenced and has a control building. Except for electrical work involving a water level transmitter at the storage tank located 500 feet mauka (west), the work will be done at the existing well site. The site is adjacent to an abandoned papaya orchard, 600 feet from the nearest lands designated as rural (R), and 1,500 feet from urban (U) lands; hence the construction work is not expected to adversely affect residents of the area.

Completion of this project (installation of a 200 gpm pump in Well "A") will produce the following situation:

1. The Well "A" pump and the existing Well "B" pump will provide a mutual backup capability since either pump alone can meet the present needs of Hana. The system design will provide automatic, but not simultaneous, operation of Well "A" and Well "B" pumps.
2. The needs of the immediate future can be met since the present average day demand on the Hana Water System is about 101,000 gpd (and the maximum day demand is probably close to 150,000 gpd), while the output capacity of either Well "A" or "B" will be 200 gpm or a total of 288,000 gpd.

3. The town of Hana, the major population center, will be served from groundwater sources which meet the standards mandated by the Safe Drinking Water Act and the State Public Health Regulations. The total Hana Water System, however, is so strung out that service areas southwest of Hana Town will continue to be fed by the surface water source from Wailua Intake (Figure 2).

On the basis of the above scenario, a potential for growth exists, and the possibility of withdrawing 288,000 gpd (0.3 mgd) from the basal aquifer is apparent. Actual withdrawal, however, will be in response to consumer demand which in turn, is a function of other factors which affect the growth of Hana. The water system, as indicated by changes in the number of service connections provided by the Maui BWS, has been "growing" at a modest rate of 2-1/2% per year since 1970 when surface water was the source. The increase has been gradual, with no abrupt change from year to year. The water system should provide for some increase in the per-capita consumption which tends to rise with the standard of living. Some growth may occur with the enhancement of the water system by conversion to groundwater sources, but no large scale population increase is expected unless a change in the economic base takes place. The relative remoteness and distance from Wailuku, together with the narrow winding roads, appear to have a greater influence than water supply on the growth of Hana's resident population. Furthermore, "the County of Maui policies and programs for the Hana area preclude tourism as a factor for growth".⁴

From the geo-hydrological viewpoint, withdrawal at the rate of 200 gpm (0.3 mgd) will have almost no effect on the overall groundwater flux, as discussed in the section on "Hydrology". However, although evidence on the mutual influences of withdrawing water from both wells simultaneously is inconclusive, Well "A" is in the hydrologic shadow (immediately downstream) of Well "B". The salinity level in Well "B" has fluctuated between 128 and 211 ppm between January and May of 1978. The record of fairly high dissolved chlorides content has influenced a decision to design the automatic operation of the Hana System to prevent the simultaneous pumping of Wells "A" and "B". Therefore, the Well "A" pump proposed for this project will provide a backup capability and not an increase in source capacity. Drawdown and salinity levels will be monitored by the Maui Department of Water Supply. The information obtained will serve as a guide to future operation of the Hana Water System.

UNAVOIDABLE ADVERSE EFFECTS

The noise and dust generated by construction will be unavoidable. These effects will be short-term and are adequately covered by environmental pollution control laws and the contract specifi-

cations. These effects will also be mitigated by a separation of about 1,000 feet between the job site and nearest home. Job-connected traffic inconvenience will be infrequent and is also covered by laws and the specifications.

ALTERNATIVES

The alternatives available to the State in lieu of installing a pump in the already drilled Hana Well "A" were:

1. Drilling at another site and installing a pump, controls and connection to the existing water system.
2. Treating surface water.
3. Conversion of brackish or sea water.
4. No action.
5. Postponement of this action to a later date.

Different site and pump. The cost of drilling a new well would be a negative factor in this alternative. The question of interference of Well "B" quantity and (saline) quality could be eliminated by selection of another site which is not in the hydrologic shadow of Well "B". However, since Well "A" is a backup, and simultaneous operation of Wells "A" and "B" is not required, nor designed, the possibility of mutual adverse influences is not an important factor, even if Well "A" is directly "downstream" of Well "B". A new site would require additional land clearing and excavation for and installation of a new pipeline connection to the existing system. In terms of cost and the environment, this alternative is less attractive than the proposed project.

Treating surface water to meet the State Drinking Water Standards would probably be an energy-intensive operation, although plants requiring only differences in elevation (potential energy) are available. A treatment plant requires a much larger surface area than a well, and plant construction usually entails extensive grading. Surface sources are also notoriously unreliable in terms of quantity and quality of water. For the relatively small needs of Hana, a treatment plant for mixed quantity-quality parameters would be an inefficient operation. The County is considering a filter plant to treat Wailua Stream water, but definite plans for construction have not been formulated.

Conversion of brackish or sea water is not an economically attractive alternative to meet the limited needs of Hana at this time. Water Desalting in Hawaii⁸ is a good discussion on this concept.

The no-action and postponement alternatives were set aside since the isolated Hana Water System has only one pumped county source. The system should have a backup source which can be called upon during breakdown and maintenance of the primary source. Without an adequate backup, Hana could be without a groundwater supply while repair crews traveled from Wailuku to Hana.

The alternatives are environmentally and economically less attractive than the proposed action. Developing water by any one the alternatives would eliminate a hydrogeologic constraint (which has influenced the system design) from consideration, and provide a source which could serve not only as a backup, but also as a real increase in supply. Such an increase in supply could have a potentially greater impact on Hana than the proposed project.

Comparative costs for the alternatives are tabulated below. The unit cost for alternative 3 is based on information obtained from "Water Desalting in Hawaii", Holmes and Narver, Inc., June 1974, for feed water and total dissolved solids of 1100 to 1550 ppm and delivered water TDS of 100 ppm.

<u>Action or Alternative</u>	<u>Unit Cost (\$/1000 gals.)</u>
Proposed Action - Install 200 gpm pump in Hana Well A	\$0.45
Alternative 1 - Drill new well, and install 200 gpm pump	\$0.60
Alternative 2 - Treatment of surface water	\$1.18
Alternative 3 - Desalting brackish water	\$1.60+

All estimates assume a project life of 30 years and interest rate of 6%. Costs for the proposed action and first two alternatives are based on bids received for past projects by the Division of Water and Land Development. Pump replacement is assumed every ten years. Additional details are included in Appendix C.

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The short-term use of the proposed pumping facility will be monitored and managed to maintain the long-term productivity of the basal aquifer. Both the short-term use and long-term use of the proposed pump will be to provide water for domestic consumption.

IRREVERSIBLE COMMITMENT OF RESOURCES

The construction of the proposed facility would commit materials and manpower to the site. The site has already been committed to water system use. Allocation of Well "A" water to domestic consumption is not an irreversible commitment. Groundwater from the basal aquifer is a renewable resource replaced by rainfall percolation.

APPROVALS REQUIRED

The construction plans will be submitted to the Maui Department of Water Supply for approval. An application to the Director of Health for use of the new water source as required by Part D, Chapter 49 of the Public Health Regulations of the State Department of Health, was approved.

REFERENCES

- ¹Soil Survey of Island of Kauai, Oahu, Maui, Molokai and Kauai, State of Hawaii, USDA-SCS, University of Hawaii, August 1972
- ²Conservation District Inventory, Island of Maui, DLNR, 1977
- ³Water Master Plan for the County of Maui, R. M. Towill Corporation, Dec. 1971
- ⁴Letter from Planning Department, County of Maui, June 13, 1978
- ⁵Geology of the Hawaiian Islands, Bulletin 8, H. T. Stearns
- ⁶Geologic and Topographic Map, Island of Maui, Hawaii, 1942, U.S. Geological Survey, Geology by H. T. Stearns
- ⁷Surface and Groundwater Resources Study Element Report, Hawaii Water Resources Regional Study
- ⁸Water Desalting in Hawaii, Holmes & Narver, Inc, June 1974
- ⁹Community Profiles for Hawaii, DPED, State of Hawaii, 1972

APPENDIX A: PARTIES CONSULTED AND COMMENTS

The following agencies and interested parties were consulted during the preparation of the environmental impact statement.

State Agencies

Department of Health
Division of Fish and Game, DLNR
Division of Forestry, DLNR
Division of State Parks, DLNR
Office of Environmental Quality Control
Natural Areas Reserves Administration

Maui County Agencies

Planning Department
Department of Water Supply
Department of Public Works

Other Parties

Hana Ranch Co.
Maui Historical Society
Corps of Engineers - Environmental Resources Section
James M. Brock, Brock & Associates
Glenn Hirano, Park Engineering, Inc.
Herman Adalist

Comments and responses on the EIS, draft EIS and Preparation Notice are attached.

Comments and Responses on the EIS

I. The following parties replied to the solicitation for comments, but offered no comments on the EIS:

A. State Agencies

1. Department of Accounting & General Services
2. Department of Transportation
3. Hawaii Housing Authority, DSSH
4. Environmental Center, University of Hawaii
5. Department of Hawaiian Home Lands
6. Department of Planning & Economic Development
7. Department of Defense
8. Maui District Health Office, DOH

B. Maui County

1. Planning Department
2. Department of Water Supply

C. Federal Agencies

1. Soil Conservation Service, Dept. of Agriculture
2. Department of the Air Force, HQ 15th Air Base Wing (PACAF)
3. HQ Fourteenth Naval District
4. Department of the Army, U. S. Army Engineer District, Honolulu
5. Department of the Army, USASCH
6. U. S. Coast Guard, Fourteenth Coast Guard District

D. Others

1. Park Engineering, Inc.

The above replies are not reproduced in the EIS.

II. The following parties commented on the EIS. The comments and responses are attached:

- A. State: Office of Environmental Quality Control
- B. Federal: U. S. Department of the Interior, Fish and Wildlife Service

GEORGE R. ARIYOSHI
GOVERNOR



RICHARD L. O'CONNELL
DIRECTOR
TELEPHONE NO.
548-6915

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

DEPT. OF LAND
STATE OF HAWAII

December 27, 1978

MEMORANDUM

TO: William Thompson, Director
Department of Land and Natural Resources

FROM: Richard L. O'Connell, Director *R. O'Connell*
Office of Environmental Quality Control

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR PUMP, CONTROLS
AND APPURTENANCES, HANA, MAUI

We have reviewed the subject document and offer the following comments for your consideration:

1. Page one contains a statement that the County of Maui believes the lifestyle of Hana and the surrounding area should remain unchanged, while on page two, the discussion indicates that the Water Master Plan is designed for maximum development of the Hana area. It appears that the Water Master Plan is inconsistent with the County's policies for Hana.
2. Page 3
The EIS does not contain a biological survey which conclusively indicates that rare, threatened, or endangered species are not within the project area.
3. Page 5
Although Well A is intended to be a back-up for Well B, can Well A be modified to be used simultaneously with Well B should the need arise? If so, a discussion of such possibility should be included.

Mr. William Thompson
Page 2
December 27, 1978

4. Page 5

The present average daily demand on the Hana Water System is approximately 101,000 gpd with peak demand being 150,000 gpd. The output capacity of either Well A or B will be 200 gpm or 288,000 gpd. This capacity is almost twice the current peak demand which would allow growth to double the existing population service. Page 6 further states, "Some growth may occur with enhancement of the water system by conversion to groundwater sources, but no large scale population increase is expected unless a change in the economic base takes place." Since the potential for significant growth exists, there should be a discussion on the possible effects of urbanization of Hana.

5. Page 8

The discussion on Short-Term Uses vs. Long-Term Productivity should be expanded to include secondary impacts such as increased urbanization. Since water is a major factor influencing growth, any increases in capacity may affect the rural setting.

We thank you for the opportunity to review the EIS.
The attached sheet lists commenting agencies and organizations.

Attachments

LIST OF COMMENTING AGENCIES AND/OR ORGANIZATIONS

FEDERAL

*U.S. Coast Guard	November 17, 1978
*Department of the Army (USASCH)	November 22, 1978
*Corps of Engineers	November 24, 1978
*Fourteenth Naval District	November 27, 1978
*Soil Conservation Service	December 7, 1978
U.S. Fish and Wildlife Service	December 22, 1978

STATE

*Department of Planning and Economic Development	November 20, 1978
*Department of Hawaiian Home Lands	November 22, 1978
Department of Health (Maui Office)	November 24, 1978
*Hawaii Housing Authority	December 1, 1978
Department of Defense	December 6, 1978
Department of Transportation	December 5, 1978
*Department of Accounting and General Services	December 7, 1978

COUNTY OF MAUI

Department of Water Supply	November 28, 1978
*Planning Department	December 1, 1978

UNIVERSITY OF HAWAII

*Environmental Center	November 24, 1978
-----------------------	-------------------

PRIVATE

Park Engineering	November 27, 1978
------------------	-------------------

*comment previously forwarded by reviewer

January 15, 1979

Mr. Richard L. O'Connell, Director
Office of Environmental Quality Control
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Environmental Impact Statement,
Pump, Controls and Appurtenances
Hana Water System, Maui

We have received your comments of December 27, 1978 and respond as follows:

Comment 1. Water Master Plan inconsistent with County policies for Hana.

The Water Master Plan of the County of Maui Board of Water Supply "specifies capacity, types and locations of water facilities," and "previews priorities of construction...in keeping with the overall growth conditions anticipated by the County of Maui Planning Department." Every "Master Plan" is geared to some kind of "maximum development" as the basis of design. Most plans also provide for phasing of improvements to keep pace with different levels of development or growth. Some areas may never attain the maximum development anticipated by master plans. The Water Master Plan is a flexible program which schedules facilities which are needed as different levels of demand arise. Therefore, even though the present mood of the County does not favor development, we see no inconsistency between the Water Master Plan and the policies of Maui County.

Comment 2. The EIS does not contain a biological survey.

We have stated in the EIS and in a previous response to you that the project is the installation of a pump in an existing well at a site which is already paved and fenced. The only other work will be the installation of a water level indicator (at an

existing storage tank) to signal the start and stop cycle of the pump. Under the circumstances, we see no reason to conduct a biological survey.

Comment 3. Can Well A be modified to be used simultaneously with Well B?

Well A can be modified for simultaneous operation with Well B, "should the need arise". We have noted in the EIS that a potential for growth exists. We have also noted the possibility of mutual interference and possible degradation of water quality with simultaneous operation. We have further pointed out that either Well A or B alone can more than meet the present needs of Hana. If growth occurs, and if demand approaches the safe yield of the system (total source capacity minus largest pumped source) the water managers would consider development of a new water source.

Comments 4 and 5. EIS should discuss "possible effects of urbanization of Hana", and expand short-term vs long-term discussion "to include secondary impacts such as increased urbanization".

With respect to possible growth of an area, we feel that at least three factors must be present for development. First, private initiative must be present. Second, public acceptance. And third, government approval must be obtained. In Hana, private initiative has been relatively quiet of late, and the public and county have voiced opposition to growth of tourism.

One possibility in Hana is that a need for expansion of tourist facilities will become apparent, private initiative will respond to this need, and resort development will be pursued with public and county blessings. Development hurdles--inadequate water transmission mains, lack of sewers and sewage treatment facilities, and inadequate drainage facilities--would have to be overcome initially. Assuming that private and/or public equity is invested to improve the inadequate infrastructure, additional capital would then have to be attracted to build the tourist hotels. If the market is favorable and monies are available for infrastructure and hotels, additional manpower would be needed. Some present Hana residents would be attracted from other jobs to tourist facilities jobs. New workers would probably be attracted from outside of Hana, and the character of Hana would change. Examples of this type of change can be seen in Kona, Hawaii, and the Lahaina district in West Maui.

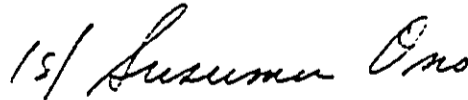
January 15, 1979

The above scenario is one growth possibility. There may be an infinite number of possibilities. We should emphasize, however, that the EIS should be concerned with the probable impacts of the action on the environment. As we have stated, this project is the installation of a backup pump designed for non-simultaneous operation in one of two existing wells which may mutually affect each other's water quality if pumped simultaneously. The probable impact on the aquifer is nil because the pumps will not be operated together and the groundwater flux is high. The probable impact on the surrounding environment is also nil because the work will be done within existing utility sites. The probable impact on Hana is no different than if only one well pump were available (except for the backup protection feature). If the resort interests perceive a need for expansion of tourist facilities, tourism may grow in response to the change in market conditions. But as long as public and county sentiment is opposed to growth, the county domestic sources will not be utilized for resort purposes.

If resort development does not contribute to broadening the economic base, we do not expect significant growth in Hana based on the present economy of ranching and other agricultural pursuits. Finally, we may point out that if a reawakening of private initiative occurs and county approval is somehow obtained, because of the plentiful supply of untapped groundwater, resort developers could easily locate their own water sources (Hana Ranch already has one) and install their own utilities, as has been done in Kaanapali. In this respect, the impact of the present project would be insignificant since resort development could conceivably proceed without the proposed pump installation in the county's domestic source at Well A.

In summary, we do not feel that this project will have significant adverse impacts on the environment. We stated in our Preparation Notice that a Negative Declaration was sufficient for this project, but "in the interest of public and legislative concerns" (HB-1998-73), an EIS was prepared "to provide ample opportunity for public input on this action". As required, we will append your comments and this response to the EIS.

Very truly yours,



SUSUMU ONO
Chairman of the Board

RTC:LA:jcs



United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 ALA MOANA BOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:

ES

Division of Ecological Services
Room 6307

December 22, 1978

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Re: EIS for Pumps, Controls,
Appurtenances-Hana Water
System, Hana, Maui

Dear Sir:

We have reviewed the subject Environmental Impact Statement (EIS)
and offer the following comments:

The EIS generally satisfies those areas of concern to the U. S. Fish
and Wildlife Service. Because the site has been developed previously
for the proposed use, the additional impacts of project construction
should be limited in duration and extent.

However, the EIS should state what additional clearing will be
necessary to provide access to the site and for temporary construction
staging and equipment storage areas. Specific dust and erosion control
measures, as well as plans for site restoration following construction,
should be fully described in the EIS. It also should include the
approximate duration of project construction.

We appreciate this opportunity to comment.

Sincerely yours,

Margaret G. Kohl
for

Maurice H. Taylor
Field Supervisor

cc: HA
HDF&G



Save Energy and You Serve America!

January 15, 1979

Mr. Maurice H. Taylor
Fish & Wildlife Service
U.S. Dept. of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Taylor:

Environmental Impact Statement
Pump, Controls & Appurtenances
Hana Water System

Thank you for your comments on the above EIS. We note that your remarks deal with construction impacts.

As noted in the EIS, the pump installation will be in an existing well which is located at an enclosed Maui Board of Water Supply site where a water transmission main is available for connection to the existing system. A control building and paved areas are also part of the existing site improvements. We do not expect to do any clearing for access or storage. We expect the project to be completed in 1979 as noted in the EIS.

For your information, environmental pollution control specifications dealing with erosion and sediment control, landscape preservation and protection, dust control, waste disposal, waste waters and noise control are standard sections included in job specifications for each of our projects.

We will include your letter in the EIS as required.

Very truly yours,

15/ Susumu Ono

SUSUMU ONO
Chairman of the Board

RTC:LA:jes

Comments and Responses on the
Draft EIS and EIS-Preparation Notice

7627
RICHARD L. O'CONNELL
DIRECTOR



TELEPHONE NO.
548-6915

73 AUG 22 A 9:04

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKUA WILA ST.
ROOM 301
HONOLULU, HAWAII 96813

August 17, 1978

MEMORANDUM

To: William Thompson, Chairman
Board of Land and Natural Resources

From: Richard L. O'Connell *R. O'Connell*

Subject: PRELIMINARY REVIEW OF DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR PUMP, CONTROL AND APPURTENANCES, HANA WATER PROJECT,
HANA, MAUI

RECEIVED
AUG 23 9:19 AM '78

As requested in your letter of August 2, 1978, we have performed a preliminary review of the subject document and offer the following comments for your consideration:

1. The EIS lacks reproduction of the comments and responses made during the consultation process. These should be included.
2. Throughout the EIS, it is stated that increased growth as a result of the project will not occur because growth is contrary to the county's policies, programs, and the attitude of the residents. What are these policies, programs, and attitudes? Are they sufficient to deter growth in the face of a stable and expandable water supply?
3. More attention should be given to the impact of tourism in Hana. A more stable water supply may encourage more tourist activity. The long, winding road from Wailuku is a questionable barrier to tourism. A review of tourist activities should be presented including such information

as the number of tourists in Hana during the past few years and the projections for the future. The means by which the tourists travel to Hana should also be noted. Are facilities available for growth of tourism?

4. On page 2, maximum development for Hana is discussed. How was this determined?
5. What is the basis for the conclusion that the proposed alternatives were infeasible? The EIS should include the facts and figures to support the conclusion.
6. If the project is completed, only Hana Town will be served exclusively through ground water. Is the current surface water supply to Hana and the surrounding areas being treated? If so, why is it more costly to continue treating this source than to build another pump? Will increased pumping affect the volume of stream water flowing to other areas? Is surface water of sufficient quantity to provide a back up water supply during periods of breakdown or maintenance?
7. Was recycling of water considered as a viable alternative? A discussion is recommended.

We trust that these Preliminary comments will be helpful to you. We will look forward to reviewing your final EIS when the document has been formally filed with the Environmental Quality Commission.

October 10, 1978

Mr. Richard L. O'Connell
Director, Office of
Environmental Quality Control
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Draft EIS for Pump, Controls and Appurte-
nances, Hana Water Project, Hana, Maui

Thank you for your comments on our draft EIS. We respond as follows:

1. The comments received during the consultation process are included in Appendix A. Our responses were submittals of the draft EIS for further comments.
2. Statements concerning the Maui County "policies and programs" are direct quotations from a letter received during the consultation process from the Planning Director. A copy of the letter is included in Appendix A. An indication of the attitude of Hana residents toward growth was obtained in discussions with the Maui Department of Water Supply.
3. The narrow winding road from Wailuku to Hana was cited as an influence on the growth of Hana's resident population, not as a "deterrent to tourism". As any driver on Hana Highway can attest, many visitors are willing to drive the 52 miles from Kahului airport to Hana and even beyond to the Seven Sacred Pools near Kipahulu. Direct flights to Hana are available through Royal Hawaiian Air Service.

Information on the number of tourists to Hana is difficult to ascertain because many of the tourists are day visitors. The establishments listed below can accommodate "overnight" guests.

October 10, 1978

Hotel Hana Maui - 61 units, one-quarter mile from Hana Bay; the only resort hotel in Hana with full dining and cocktail lounge facilities.

Hana Kai Apartments - 19 units condominium on Hana Bay.

Heavenly Hana Inn - 4 units motel on Hana Highway.

Kanakea Kottages - 5 units opposite Heavenly Hana Inn.

On the assumption that occupancy rates are between 50% and 75%, the 89 units probably accommodate 90 to 135 guests per day.

4. Table I-26 (attached) of the "Water Master Plan for the County of Maui" is the source, as noted. The study assumed a density of 13 persons per acre over 289.7 acres (3766 persons) for residential use, and an apartment use density of 40 persons per acre over 66.1 acres (2644 persons). The sum of the density-acreage products yields 6410 persons. The figures were generated for planning purposes, to determine future water system needs if growth occurs as assumed in the Water Master Plan.
5. We do not state that the alternatives are "infeasible". We contend that the alternatives are environmentally or economically less attractive than the proposed action. The project is the installation of a pump in an existing well at a site which is already paved and fenced. The alternatives considered would require clearing, grubbing, grading and/or drilling, and would therefore be more unsettling to the environment as well as more costly than the proposed action. As noted in the EIS, a hydrogeologic constraint has influenced the design of the Hana System so that Well A will operate only as a backup, and not as an increase in supply. Developing water by any one of the alternatives would eliminate the hydrogeologic constraint from consideration, and provide a source which could serve not only as a backup, but also as a real increase in supply. Such an increase in supply could have a potentially greater impact on Hana than the proposed project. A brief qualitative analysis of the alternatives was presented because the proposed action clearly has the least potential for adverse impacts. However, our final EIS will include the following cost comparison.

October 10, 1978

<u>Action or Alternative</u>	<u>Unit Cost (\$/1000 gallon)</u>
Proposed Action - Install 200 gpm pump in Hana Well A	\$0.45
Alternative 1 - Drill new well and install 200 gpm pump	\$0.60
Alternative 2 - Treatment of surface water	\$1.18
Alternative 3 - Desalting of brackish water	\$1.60+

Notes:

- a. Estimates for the proposed action and alternatives 1 and 2 are based on past projects by the Division of Water and Land Development.
 - b. The unit cost figure for alternative 3 is based on information obtained from "Water Desalting in Hawaii", Holmes and Narver, Inc., June 1974, for feed water and total dissolved solids of 1100 to 1550 ppm and delivered water TDS of 100 ppm.
 - c. Estimates assume a project life of 30 years, interest rate of 6%. Pump replacement is assumed every ten years.
6. The surface water from Wailua Stream Intake is not treated at present. The Maui Department of Water Supply is considering installation of a filter plant but no definite plans for construction have been set. The experience of the Department has been that the quantity from Wailua Intake may be insufficient at times, and the quality may, at times, be below the standards desired by the agency. The proposed pump is seven miles away from the Wailua Intake, and will have no effect on Wailua Stream flow. As noted in the EIS, the rocks in the region of the well are so permeable that very little runoff occurs.
 7. Recycling of water was not considered a viable alternative because Hana has no system to collect or treat sewage.

Mr. Richard O'Connell

-4-

October 10, 1978

Your comments have been helpful to us. We will revise our EIS where appropriate before we file our final EIS. Your letter will be included in the EIS as required.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

RTC:LA:jes
Attach.

TABLE NO. I-26

ADOPTED DESIGN CRITERIA
FOR
HAWAII

Area Land Use	Per Acre	GPCD	GPAC	1980 35% of Max Development		1990 70% of Max Development		Max Development (2,000)		
				Acres	Population	Acres	Population	Acres	Population	Flow
Residential	13	140	1,800	101.4	1,318	0.1825	202.9	289.7	3,766	0.5182
Apartment	40	140	5,600	23.1	925	0.1294	46.2	66.1	2,644	0.3702
Commercial	-	-	6,000	5.8	-	0.0348	11.6	16.5	-	0.0990
Hotel	-	-	17,000	9.9	-	0.1683	19.8	28.3	-	0.4811
Public	-	-	1,700	13.2	-	0.0224	26.4	37.8	-	0.0643
Industrial	-	-	6,000	5.6	-	0.0336	11.1	15.9	-	0.0954
SUM				159.0	2,243	0.5710	318.0	454.3	6,410	1.630

Don
BROCK AND ASSOCIATES
SURVEYORS - ENGINEERS

RECEIVED

7505
65

78 AUG 16 A 8: 56

48 MARKET STREET
WAILUKU, MAUI, HAWAII 96793
TELEPHONE [808] 244-7464

FILE: 7000
August 15th, 1978

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

Mr. W. Y. Thompson
Board of Land and Natural Resources
P. O. Box 621
Honolulu, Oahu, Hawaii
96809

LAND DEVELOPMENT

78 AUG 21 P 2: 31

RECEIVED

Dear Mr. Thompson:

Re: Job No. 35-MW-31
Pump, Controls and Appurtenances
Wakiu, Hana, Maui, Hawaii

Thank you for your letter of the 2nd of August.

I have read the draft EIS and feel it is more than adequate. Two comments:

1. re historical concerns . . the general area is, of course, the site of a series of battles between the forces of Kalaniopuu and the Maui/Hana chiefs which took place in the 1770's. I have both hiked and surveyed in the general area and have never seen, however, any sites of interest.

2. re economic concerns . . there is a lack of information on the general cost of the proposed project and the source of funds. Will not also the resulting fixture require some sort of continued maintenance and therefore continued expense: . . have these continuing expenses been budgeted for and in which budget . county or state?

We are encouraged by the efforts of the state to improve the water situation in Hana. Thank you for the opportunity to comment.

Very truly yours,
BROCK AND ASSOCIATES

Jim Brock
James Melmuth Brock
Principal, Land Surveyor

August 25, 1978

Mr. James Melmuth Brock
Principal, Land Surveyor
Brock and Associates
48 Market Street
Wailuku, Hawaii 96793

Dear Mr. Brock:

Job No. 35-MW-31, Pump, Controls and
Appurtenances, Hana Water System

Thank you for your letter of August 15, 1978 in response to our draft EIS. The completed project will be turned over to and will be operated and maintained by the County Department of Water Supply. Construction funding will be through appropriations provided by Act 217/74, and Act 195/75 as noted on page one of the draft EIS. Total cost of the project is estimated to be \$150,000.

Your constructive comments are appreciated. Your letter will be reproduced in the final EIS as required under Section 142:m of the EIS regulations.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

RTC:LA:ln

Duro

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DEPARTMENT OF THE ARMY
PACIFIC (OCEAN) DIVISION, CORPS OF ENGINEERS
BUILDING 230
FT. SHAFTER, HAWAII 96858

78 AUG 15 9:23

PODED-FV

14 August 1978

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

Mr. William Y. Thompson, Chairman
Board of Land and Natural Resources
Department of Land and Natural Resources
State of Hawaii
PO Box 621
Honolulu, HI 96809

RECEIVED
78 AUG 21 P 2: 31
LAND DEVELOPMENT

Dear Mr. Thompson:

We have reviewed the Draft Environmental Impact Statement for Pump, Controls and Appurtenances for the Hana Water Project, Hana, Maui. We find that the proposed water development plan does not affect any existing or planned US Army Corps of Engineers projects and a Department of the Army permit will not be required. The DEIS adequately addresses all areas of Corps concern.

We would appreciate receiving a copy of the Final Environmental Impact Statement for the proposed water system and thank you for the opportunity to review the draft plan.

Sincerely yours,

Kisuk Cheung
KISUK CHEUNG
Chief, Engineering Division

August 25, 1978

Mr. Kisuk Cheung
Chief, Engineering Division
Pacific Ocean Division,
Corps of Engineers
Building 230, Fort Shafter
Hawaii 96858

Dear Mr. Cheung:

Job No. 35-MW-31, Pump, Controls and
Appurtenances, Hana Water System

Thank you for your comments of August 14, 1978. We will arrange to send a copy of the final EIS to you. Your letter will be included in the final EIS as required under Section 142:m of the EIS regulations.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

RTC:LA:ln

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

78 AUG 16 8:56

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII



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

August 15, 1978

7509

GEORGE A. L. YUEN
DIRECTOR OF HEALTH
Audrey W. Mertz, M.D., M.P.H.
Deputy Director of Health
Henry N. Thompson, M.A.
Deputy Director of Health
James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

In reply, please refer to:
File: EPHS - SS

MEMORANDUM

To: Mr. William Thompson, Chairman of the Board
Department of Land & Natural Resources

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Pump, Controls and
Appurtenances, Hana, Maui, Hawaii, Job No. 35-MW-31

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to this project.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

for Brian J. J. Chong
JAMES S. KUMAGAI, Ph.D.

cc: Environmental Quality Commission

RECEIVED
AUG 21 9:21:07
DEPARTMENT

PLANNING DEPARTMENT
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793
TELEPHONE: 935-2111
TELEFAX: 935-2112



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

August 10, 1978

Mr. William Y. Thompson
Chairman of the Board
Department of Land & Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Thompson:

Subject: Draft EIS - Pumps, Controls and Appurtenances,
Hana Water Project, Hana, Maui

Thank you for the opportunity to review the subject draft
environmental impact statement.

We have no other comments or additions to make aside from our
June 13, 1978, communication.

Please contact my office should there be any questions.

Yours very truly,

A handwritten signature in cursive script, appearing to read 'Tosh Ishikawa'.

TOSH ISHIKAWA
Planning Director

Downey
↑

7720
65



DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

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

August 24, 1978

Mr. W. Y. Thompson, Chairman
Board of Land & Natural Resources
P. O. Box 621
Honolulu, Hi 96809

Dear Mr. Thompson:

Subject: Job No. 35-MW-31, Pump, Controls and Appurtenances,
Hana, Maui, Hawaii

We have reviewed the draft of the environmental impact statement and happy to report that it is well written and we do not have any corrections, suggestions or new information to offer.

Your help in getting this project going will be greatly appreciated. We really need this additional pumping facility for our Hana Water System.

Sincerely,

Tatsumi Imada, Director
Department of Water Supply

cc: Engr.
CO

"By Water All Things Find Life"

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

RECEIVED



79 JUL 13 AM 11:39

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

ER &
LAND DEVELOPMENT

DIVISION OF FISH AND GAME
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

July 12, 1978

MEMORANDUM

TO: Robert T. Chuck, Manager-Chief Engineer
Division of Water and Land Development

FROM: Kenji Ego, Director
Division of Fish and Game

SUBJECT: Job No. 35-MW-31, Pump, Controls and Appurtenances,
Hana Water Project, Maui

As the site is a portion of an abandoned papaya orchard and as such is already altered from a natural state, impacts on wildlife values will be negligible. There are no endangered species present and there is no conflict with public hunting.

KENJI EGO, Director
Division of Fish and Game

KE:RLW:rfm

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78 JUL 3 P 3: 49

78 JUN 30 A 9: 04

DEPARTMENT OF WATER SUPPLY

COUNTY OF MAUI

P. O. BOX 1109

WAILUKU, MAUI, HAWAII 96793

LAND DEVELOPMENT

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

June 28, 1978

Mr. William Y. Thompson
Chairman of the Board
Department of Land & Natural Resources
P. O. Box 621
Honolulu, Hi 96809

Dear Mr. Thompson:

Subject: Job No. 35-MW-31, Pump, Controls and Appurtenances,
Hana Water Project, Maui

This will acknowledge receipt of your letter dated May 26, 1978 regarding the preparation of Environmental Impact Statement for the subject project.

The construction of this project is necessary for the operation and maintenance of the Hana Water System to meet the Safe Drinking Water Standards.

With the development of Well "A", the water system will be provided with a standby in case of failure of Pump "B", a more flexible and efficient operation of the system, and to ensure a more dependable service especially because of the remoteness of the area.

Thank you for giving us the opportunity to review and comment on the subject project.

Sincerely,

Tatsumi Imada, Director
Department of Water Supply

TI/ao

"By Water All Things Find Life"

PLANNING COMMISSION
Shiro Hokama, Chairman
Charles Ota, Vice Chairman
Patrick Kawano
Marvin Romme
Harlow Wright
Rejilio Taddol
Wesley Wong
Wayne Uemas, Ex-officio
Tatsumi Imada, Ex-Officio



Elmer Cravaiho 8162
Mayor
Tosh Ishikawa
Planning Director
Yoshikazu "Zuke" Matsui
Deputy Planning Director

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

June 13, 1978

Mr. William Y. Thompson
Chairman of the Board
Department of Land
and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

RECEIVED
78 JUN 19 P 2: 54
PLANNING DEPARTMENT

Dear Mr. Thompson:

Re: Job No. 35-MW-31, Pump, Controls and Appurtenances,
Hana Water Project, Maui

This will acknowledge receipt of your letter, with enclosures,
dated May 26, 1978, relative to the above matter.

Please be advised of our comments as follows:

1. We believe the proposed project is essential and necessary
in assuring a dependable supply of water for the Hana Town area, and
as a means to meet the Federal and State Drinking Water Standards.

2. We do not agree with or support any direct or indirect
reference to tourism as a growth factor for Hana.

The County of Maui policies and programs for the Hana area preclude
tourism as a factor for growth. We believe the life style of Hana
and its surrounding areas should remain unchanged.

Accordingly, the improvement of the water supply and delivery
system for Hana is solely for agricultural purposes and for the
permanent residents of Hana.

Thank you for the opportunity to review and comment on the above
matter.

Please contact my office, should you have any questions.

Yours very truly,

TOSH ISHIKAWA, PLANNING DIRECTOR

cc Mr. T. Imada

GEORGE A. LAIYOSHI
GOVERNOR OF HAWAII

- ASST ADMIN.
- ADMIN. ASST
- DEV. BR.
- PLAN. BR.
- RES. MGT. BR.
- CLERICAL STAFF
- HIST. SITES SEC.



STATE OF HAWAII

- DIVISIONS:
- CONVEYANCES
- FISH AND GAME
- FORESTRY
- LAND MANAGEMENT
- STATE PARKS
- WATER AND LAND DEVELOPMENT

- FOR: DEPARTMENT OF LAND AND NATURAL RESOURCES
- CIRC. DIVISION OF WATER AND LAND DEVELOPMENT
- COMMENTS & REC.
- DRAFT REPLY
- FILE
- FOLLOW UP
- INFO
- SEE ME
- SIGNATURE

P. O. BOX 373
HONOLULU, HAWAII 96809

May 23, 1978

RECEIVED
78 JUN 8 P 3:23
LAND DEVELOPMENT

MEMORANDUM

FROM: Division of Fish & Game
Division of Forestry
~~Division of State Parks~~

TO: FROM: Robert T. Chuck

SUBJECT: Job No. 35-MW-31, Pump, Controls and Appurtenances, Hana Water Project, Maui

Enclosed is a copy of an EIS Preparation Notice which we submitted to the Environmental Quality Commission.

We would appreciate receiving any comments you might offer, or any information which would be helpful in the preparation of the Environmental Impact Statement.

Robert T. Chuck

ROBERT T. CHUCK

JUNE 7, 1978

Division of Water & Land Development:

No adverse effects anticipated. Anticipated benefits: (1) dependable water supply, precluding past need to close down park overnight uses for significant periods of time, (2) improved water quality--now usually is muddy and/or stained following heavy rains.

J. M. Supan, Jr.
J. M. SUPAN, JR.
Division of State Parks

BROCK AND ASSOCIATES
SURVEYORS • ENGINEERS

48 MARKET STREET
WAILUKU, MAUI, HAWAII 96793
TELEPHONE (808) 244-7464

FILE 7000
June 12th, 1978

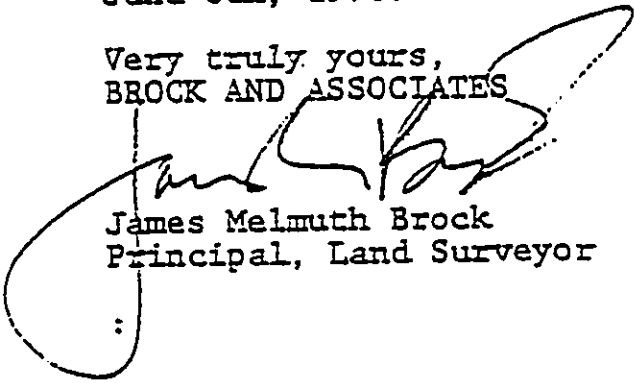
Division of Land and
Water Development
P. O. Box 621
Honolulu, Oahu, Hawaii 96809

RECEIVED
78 JUN 15 4:10
DIVISION OF LAND DEVELOPMENT

Gentlemen:

We would appreciate receiving a copy of the draft environmental impact statement for the Hana Water Project as reported in the EQC bulletin, June 8th, 1978.

Very truly yours,
BROCK AND ASSOCIATES


James Melmuth Brock
Principal, Land Surveyor

TO
9



Maui Historical Society

5902
6

P. O. Box 1018

Wailuku, Hawaii 96793

3 10 30
June 1, 1978

Hale Hoikeke - 1841

Mr. W.Y. Thompson, Chairman
Division of Water and Land Development
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

LAND DEVELOPMENT
&
WATER

78 JUN 6 11:43

RECEIVED

Dear Mr. Thompson,

In reply to your letter of May 26, 1978, re Job No. 35-MW-31, Pump, Controls and Appurtenances, Hana Water Project, Maui, we do not believe there is anything we can add to your environmental impact statement.

I have personally checked the Bishop Museum Survey maps of that area, and the closest area of historical interest would be the Wainapanapa Complex, located in the State Park, which is quite a distance from the well site you have in mind. It is our considered opinion that any decision or information of importance to the project should come from geologists and well-water specialists, rather than from those who are concerned mainly with surface features of the area.

We appreciate your considering us in this matter, as naturally anything concerning the welfare of the island of Maui is our concern, but we are not experts in the right field.

Sincerely,

Virginia Wirtz
(Mrs.) Virginia Wirtz, Museum Director

APPENDIX B: HANA WELL "A", AN ACCOUNT OF WELL DEVELOPMENT

Hana Well "A" is 10-inch cased well begun at elevation 266 feet and drilled to a depth of 288 feet (-22 ft. msl) at latitude 20°46'36", longitude 150°00'26". An as-built well section and geologic section based on drilling logs are attached. A plot of data from a well test conducted between August 29, 1977 and September 1, 1977, and results of chemical tests conducted by the U.S. Geological Survey are also attached. When pumped at a rate between 200 and 250 gpm for more than 36 hours, the chloride content did not exceed 190 ppm, and the drawdown (roughly adjusted for tidal fluctuations) was about 0.3 feet.

Chronology of Events. This brief account of the drilling and rehabilitation of Hana Well "A" is based on office memos and interviews with staff members of the Division of Water and Land Development.

1. Well "A" was drilled in April, 1972, tested at 250 gpm. The average drawdown was about one(1) feet, specific capacity was 250 gpm per foot of drawdown and chloride content was 140 ppm. After the test the annular space between the casing and the limits of the drilled hole was grouted with cement mortar. The plans called for grouting down to elevation 50 feet msl, well above the water level elevation of 1 feet msl.
2. Fall of 1975. Temporary use of the well showed a yield of only 100 gpm with a drawdown of 15'+ (specific capacity of 7 gpm per ft. dd.) and chloride content of 540 ppm. Geologic diagnosis: cement grout entered and partly plugged the aquifer.
3. February 1976. Redevelopment Attempt No. 1. A decision was made to attempt recovery of the original 250 gpm yield by "acidizing" the well. The well was acidized with 210 gallons of HCl (muriatic acid) by gravity injection through a 3/4-inch polyethelene pipe to the top of the aquifer at a rate of one gallon-per-minute. While preparing the well for acidizing, the presence of cement and concrete fragments in bail samples confirmed that cement grout had penetrated the aquifer.

Pumping test results: Discharge 110 gpm; drawdown 8 feet; chloride content 700 ppm.
Conclusion: Part of original yield regained.
Prognosis: Additional acidizing should further improve yield and lower the chloride content.
4. April 1976. Acidizing with 486 gallons muriatic acid.
5. May 1976. Acidizing.

6. June 1976. The well was acidized with 1,700 gallons of HCl.

Pumping test results: Discharge 70 gpm; drawdown 14 feet; chloride content 680 ppm.

Conclusion: Yield not improved.

7. July 1976. The well was deepened from -22 ft. msl to -37 ft. msl, and produced 100 gpm of 290 ppm chloride content water with a drawdown of 2 feet. The well could also produce 200 gpm with a 5 feet drawdown but chloride content was 330 ppm, exceeding drinking water standards.

8. August 1977. The 15 feet deepening performed in July, 1976 was replugged with concrete, and the following program was undertaken: (1) blasting 2 lb. charges at one-foot intervals between -19 ft. msl to -7 ft. msl, (2) drilling, (3) bailing, and (4) testing the well.

Pumping test results: Discharge 250 gpm, drawdown 0.3 feet; chloride content 190 ppm.

Hana Well "A" was deemed suitable as a domestic water source based on the test results of August 1977.

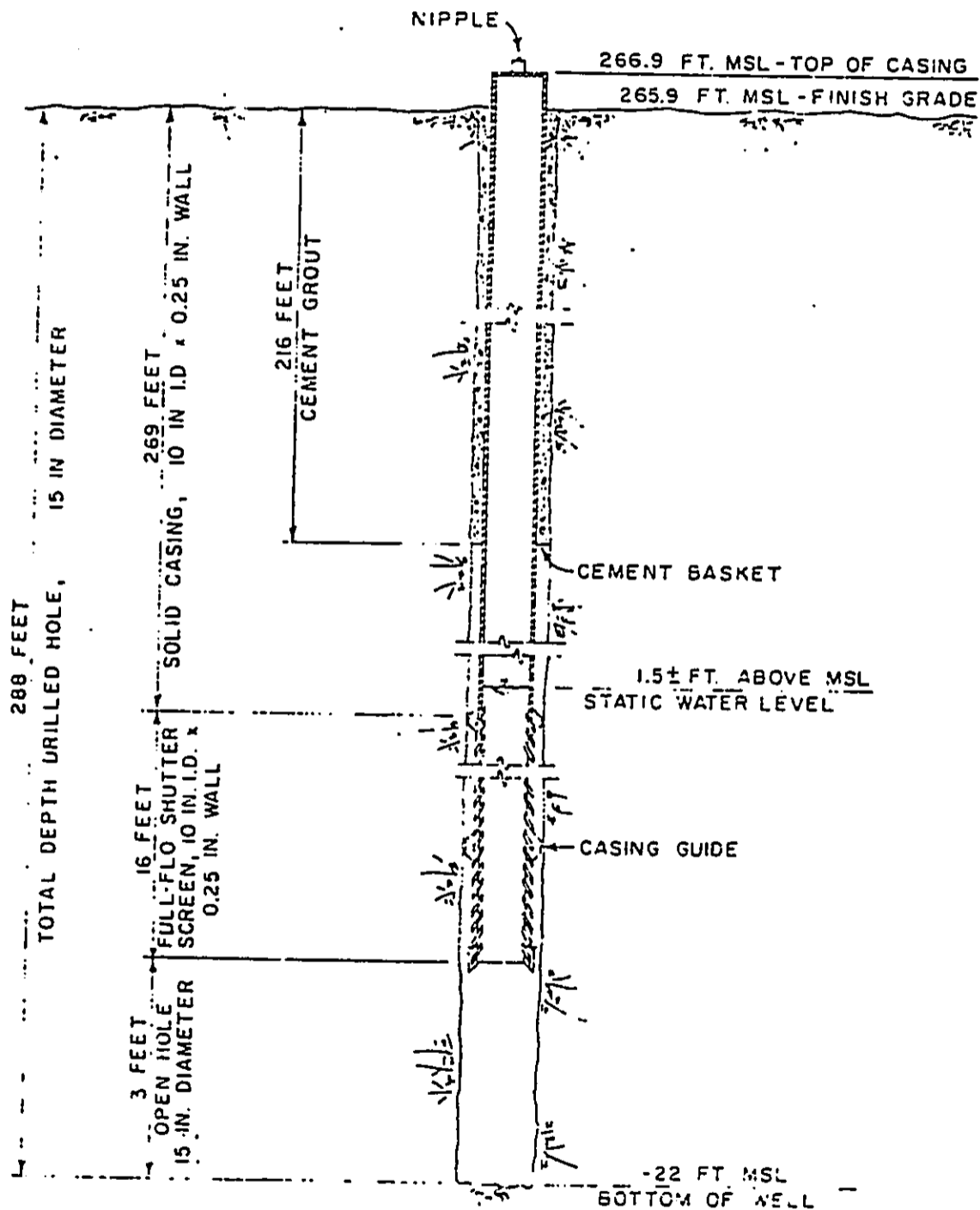
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT

HANA WELL 4600-02

HANA, MAUI, HAWAII

AS BUILT SECTION

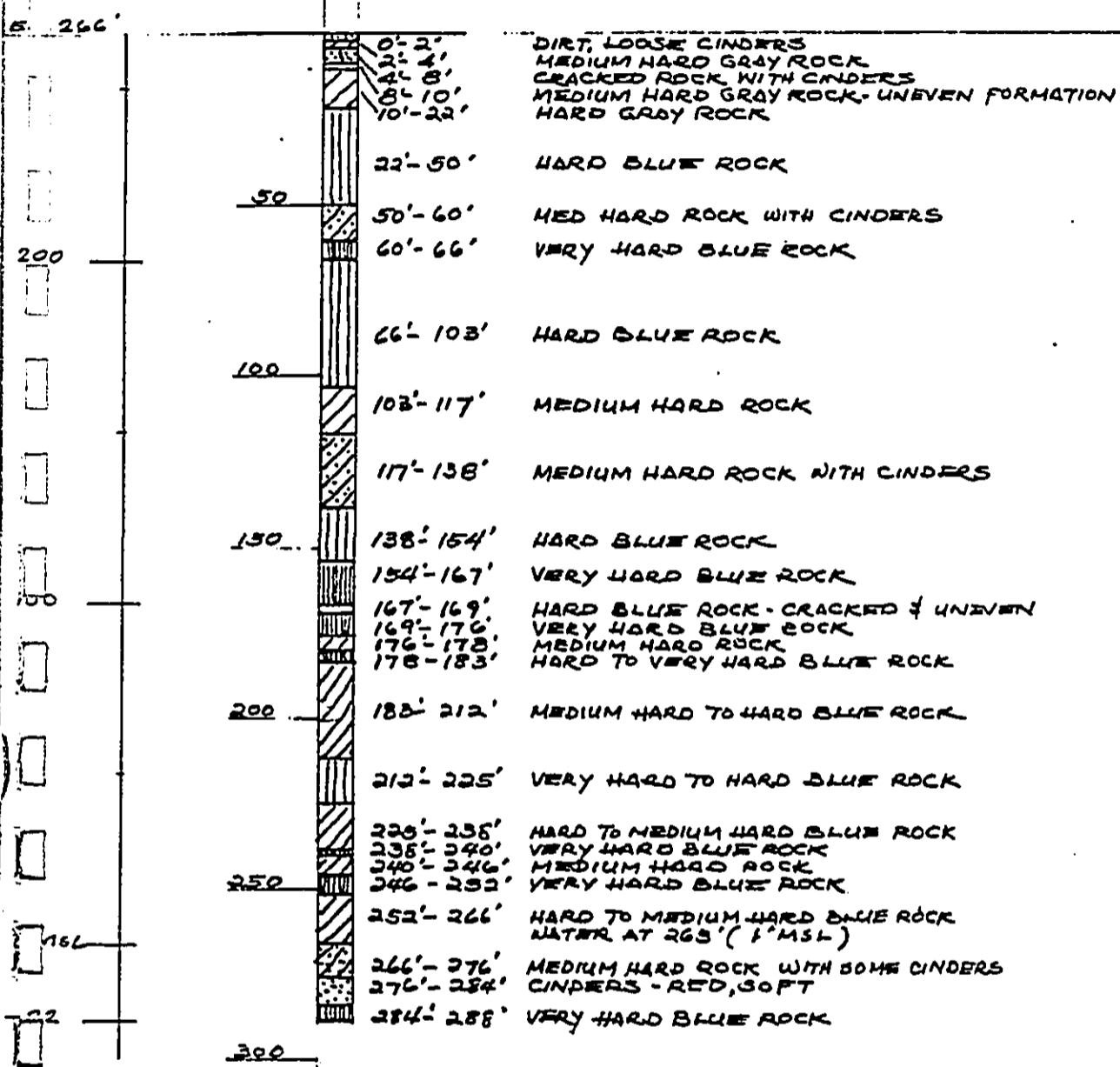
DRILLED: APRIL 1972
DRILLER: WATER RESOURCES INTERNATIONAL, INC.



NOT TO SCALE

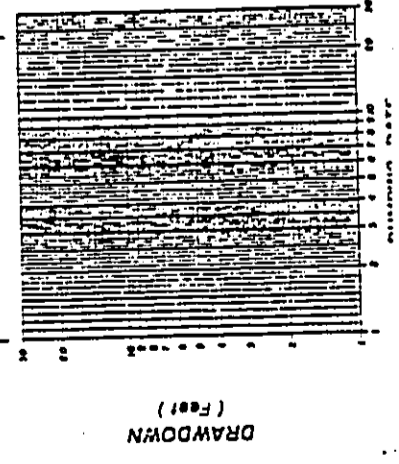
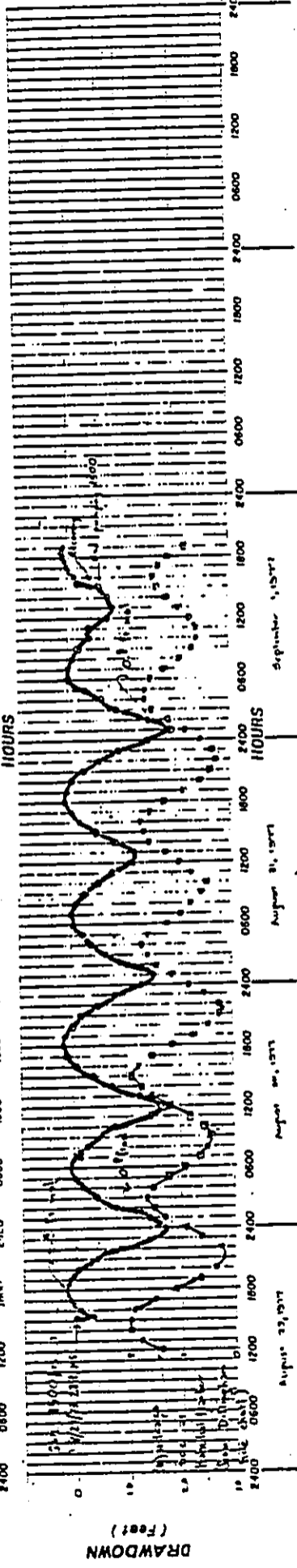
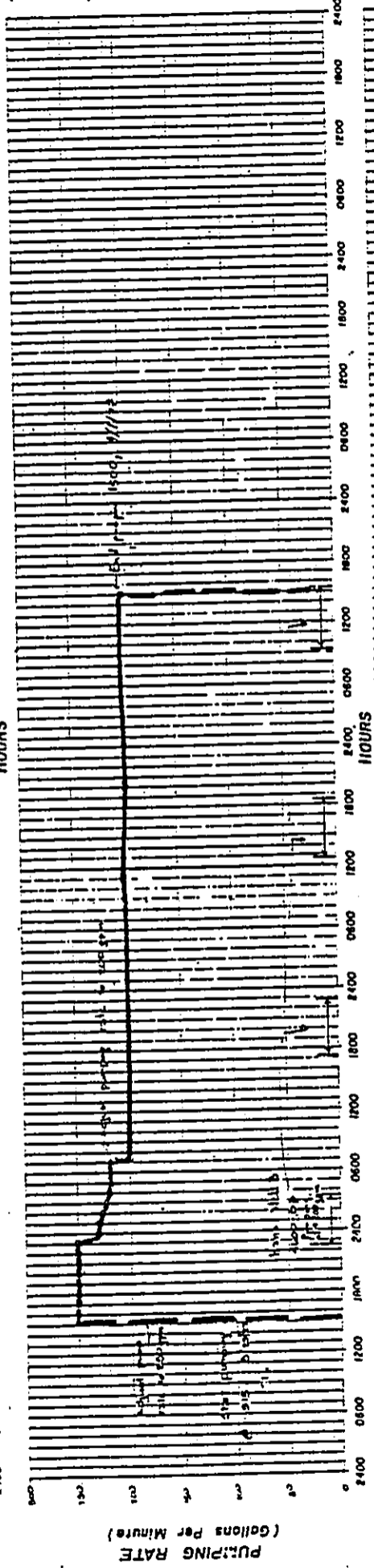
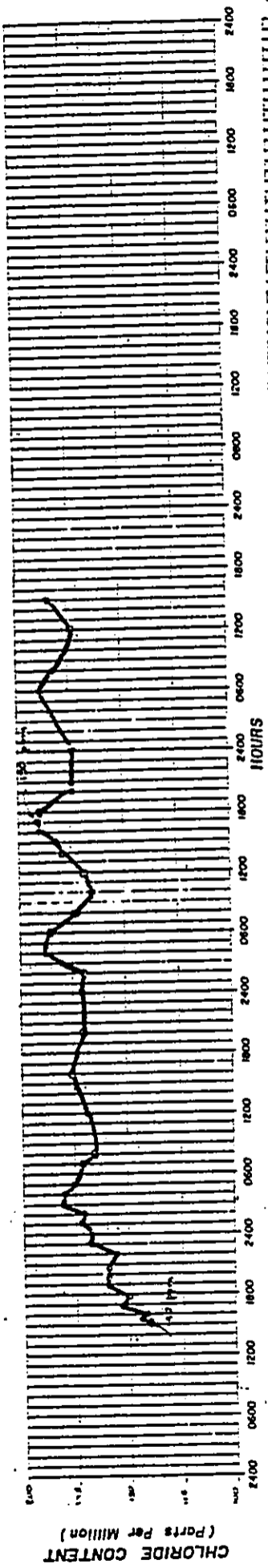
HANA WELL "A" (4600-02)

HANA, MAUI, HAWAII



286 FEET OF CASING SET IN WELL
1 FEET OF CASING ABOVE GROUND

270 FEET OF SOLID 10" CASING
10 FEET OF PERFORATED CASING



PHYSICAL DATA

Ground Elevation 1000 ft, MSL
 Size of Casing 10"
 Depth of Casing (total) 700 ft.
 Depth of Casing (screened) 650 ft.
 Depth of Hole 1000 ft. (WSP was extended to original depth of 1000 ft. to casing adjustment)
 Water Temperature 66.5° F
 Latitude 19° 45' 30"
 Longitude 155° 40' 30"

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 DIVISION OF WATER AND LAND DEVELOPMENT

Hono Well A (1000-02) 1. installed in 1954
 base, then, however, when etc. with a lot of
 Pump test, after blasting, however, with a lot of
 15 lbs of dynamite + drilling + blasting next out of well

test conducted by E. Salas + J. A. ...

September 1, 1957

August 31, 1957

August 22, 1957

STATION NUMBER: 20-636156002601

LOCAL IDENTIFIER: 6-600-02 STATE HANA, MAUI

WATER YEAR - 1977

TYPE OF STATION: WELL LATITUDE-LONGITUDE: 20-636 1560026.01 STATE: 15 COUNTY: DOY DISTRICT: 15

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
P.O. BOX 50166
HONOLULU, HAWAII 96850

COPY

DATE 1977
TYPE TIME
1977

DATE	TYPE	TIME	ALKA-LIMITY AS (MG/L)	BICAP-BONATE (MG/L)	DIS-SOLVED CAL (MG/L)	CAR-BONATE (MG/L)	DIS-SOLVED CHLORIDE (MG/L)	SPE-CIFIC CONDUCTANCE (MICRO-MHOS)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED FLUORIDE (MG/L)	NON-CARBONATE HARDNESS (MG/L)
SEP. 01...	2	1500	00410	00440	00915	00445	00940	00095	70301	70303	00950	00902

DATE	TYPE	TIME	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED IRON (UG/L)	HARDNESS (CA+MG) (MG/L)	PH	DIS-SOLVED SILICA (SI02) (MG/L)	SODIUM AD-SORPTION RATIO	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	DIS-SOLVED SULFATE (SO4) (MG/L)	TEMPERATURE (DEG C)
SEP. 01...	69	10	00925	01046	00900	00400	00955	00931	00930	00932	00945	00010

DATE	TYPE	TIME	DIS-SOLVED PHOSPHATE (PK) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	PH	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)
SEP. 01...	12	12	01056	00935	00400	00935	00955	00931	00930	00932	00945	00010

DATE	TYPE	TIME	CARBON DIOXIDE (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)	DIS-SOLVED SODIUM (MG/L)
SEP. 01...	1.0	1.0	00405	00955	00935	00955	00955	00931	00930	00932	00945	00010

Water Sample Collected by STATE DOWALD

PRELIMINARY DATA
SUBJECT TO REVISION

6-4600-02

APPENDIX C: COST ESTIMATES (Life = 30 years, interest = 6%)

I. Proposed Project - Install 200 gpm pump in Hana Well A

Pump for head of 330', discharge of 200 gpm:	\$100,000
Replacement pump: (\$46,000)	
Present worth of replacement pump eleven years hence	24,000
Present worth of replacement pump twenty-one years hence	<u>14,000</u>
Present worth of all capital outlays	\$138,000
Annual cost of capital outlays	\$10,000
Annual operation & maintenance	<u>8,000</u>
Total annual cost	\$18,000
Annual production of water based on 1977 demand:	40,000,000 gallons
Cost per 1000 gallons:	<u>\$0.45/1000 gallons</u>

II. Alternative 1 - New Well and 200 gpm pump

Well cost for depth of 300', 10-inch casing	\$ 75,000
Present worth of capital outlays for 200 gpm pump and two replacements as computed for "proposed project"	<u>138,000</u>
Present worth of capital outlays for Alternative 1	\$213,000
Annual cost of capital outlays	\$16,000
Annual operation and maintenance	<u>8,000</u>
Total annual cost	\$24,000
Annual production of water:	40,000,000 gallons
Cost per 1000 gallons:	<u>\$0.60/1000 gallons</u>

III. Alternative 2 - Treatment of Surface Water

Plant cost for 0.3 mgd facility using
chemical coagulation and filter package \$500,000

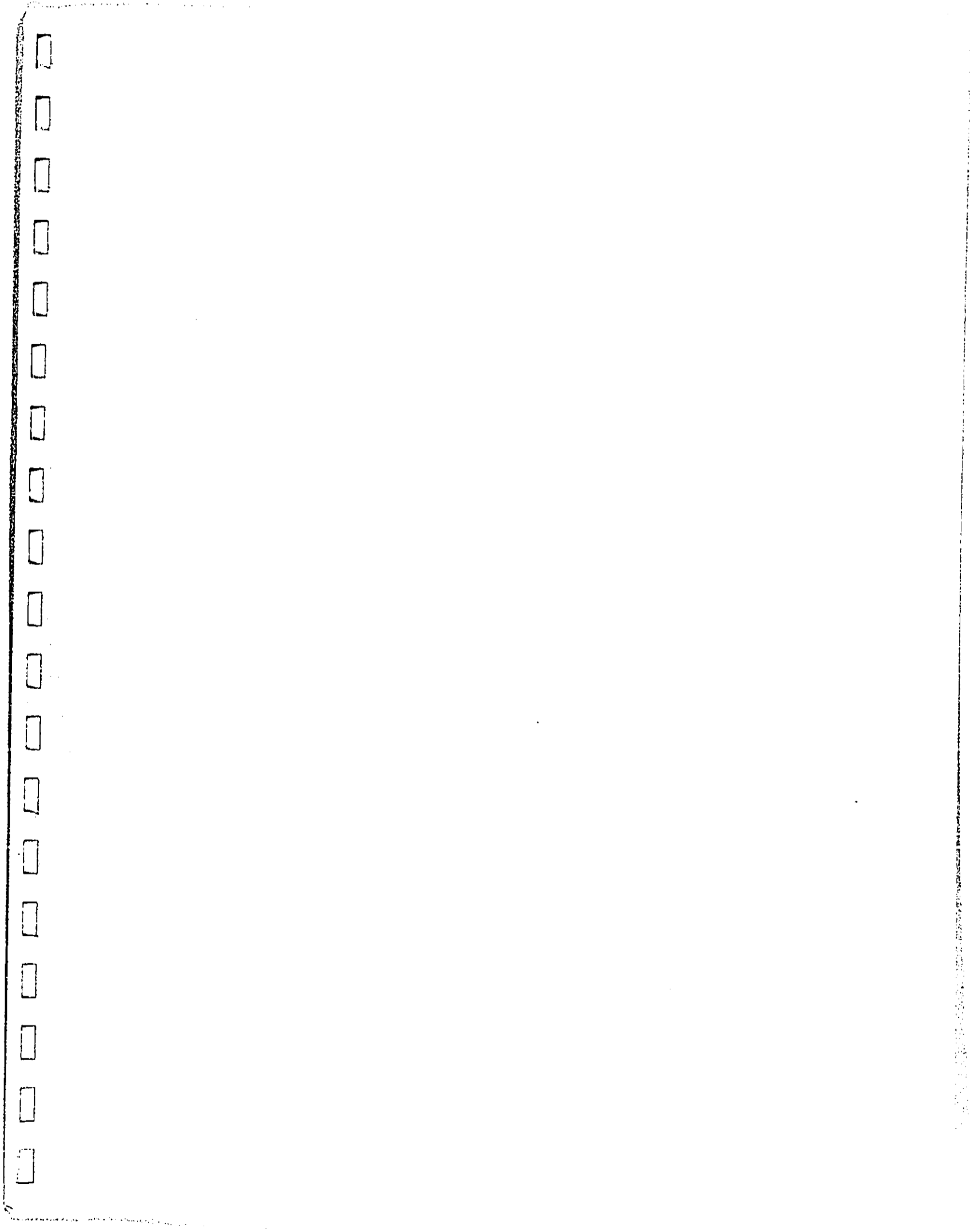
Annual cost of plant \$37,000

Annual operation & maintenance 10,000

Total annual cost \$47,000

Annual production of water: 40,000,000 gallons

Cost per 1000 gallons: \$1.18/1000 gallons



Office of Environmental Quality Control
Office of the Governor
550 State Avenue, Street
Tax Office Building, Third Floor
Kansas City, Missouri 64108