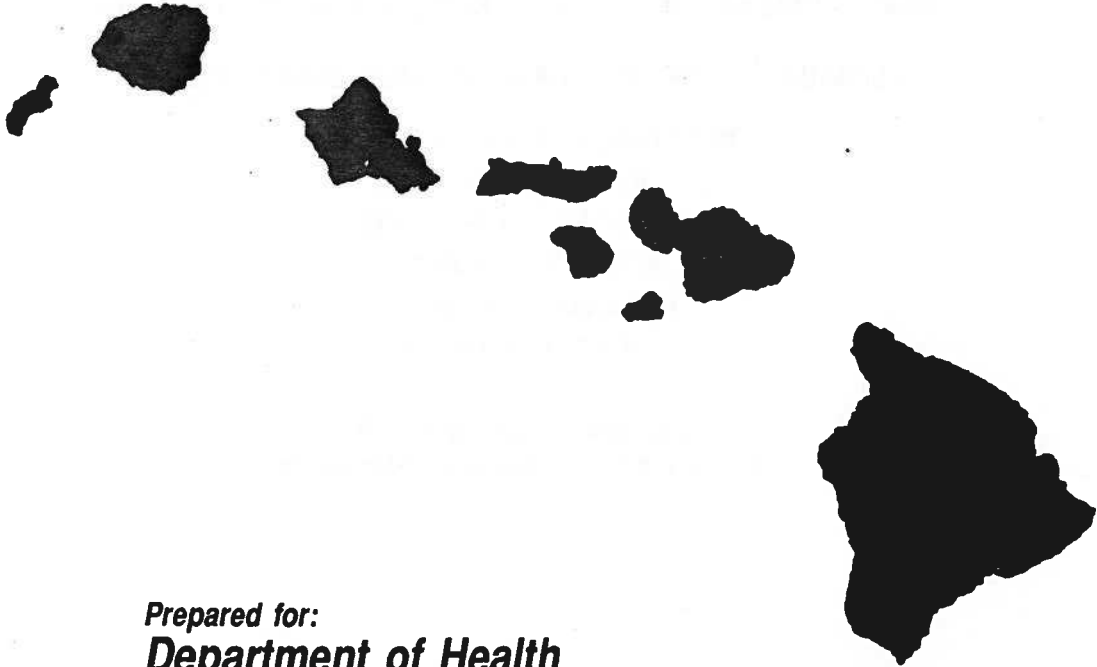


HAWAII WATER PLAN

WATER QUALITY PLAN



Prepared for:
Department of Health
State of Hawaii

By:
KRP Information Services



Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii

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Exhibit 35

**AQUIFER IDENTIFICATION AND CLASSIFICATION FOR O'AHU:
Groundwater Protection Strategy for Hawai'i**

**John F. Mink
L. Stephen Lau**

Technical Report No. 179

November 1987

**Project Completion Report
for
Identification of Class I: Special Groundwaters
Highly Vulnerable to Contamination, Oahu
Project No.: T-763
Principal Investigator: L. Stephen Lau
Project Period: 1 June 1986-30 November 1987
Funding Agency: Department of Health, State of Hawaii**

**WATER RESOURCES RESEARCH CENTER
UNIVERSITY OF HAWAII AT MANOA
Honolulu, Hawaii 96822**

Table 1 lists the Aquifer Codes for the island of O'ahu along with Sector and Aquifer System names. O'ahu includes 6 Sectors, 24 Aquifer Systems, and 87 Aquifer Types. Also listed is the Status Code of each Aquifer Type. The Status Code, which is described in the next section, summarizes elements crucial to the groundwater protection strategy.

GROUNDWATER PROTECTION: STATUS CODE

Concepts of EPA's groundwater classification conforming to Hawai'i conditions are used to devise a groundwater Status Code that describes development stage, utility, salinity, uniqueness, and vulnerability to contamination of the aquifers. The Status Code is conveniently attached to the Aquifer Code, and the combination is an efficient representation of location, hydrology, geology, utility, water quality, and contamination potential of groundwater resources in every part of the island.

The five digit Status Code consists of a single number from each of five separate descriptive categories. The categories and their status elements with identifying numbers are as follows.

- A. Development Stage
 - 1. Currently used
 - 2. Potential use
 - 3. No potential use
- B. Utility
 - 1. Drinking
 - 2. Ecologically important
 - 3. Neither
- C. Salinity (mg/l Cl⁻)
 - 1. Fresh (<250)
 - 2. Low (250 -1000)
 - 3. Moderate (1000 -5000)
 - 4. High (5000 -15,000)
 - 5. Seawater (>15,000)
- D. Uniqueness
 - 1. Irreplaceable
 - 2. Replaceable
- E. Vulnerability to Contamination
 - 1. High
 - 2. Moderate

3. Low

4. None

Only one number from each major category listed above is allowable in the Status Code. For instance, a currently developed groundwater source (1), used for drinking (1), having a salinity of less than 250 mg/l Cl^- (1), being irreplaceable (1) and highly vulnerable to contamination (1), would have the Status Code 11111. If it were ecologically important but not suitable for drinking with a salinity of 750 mg/l Cl^- , other categories the same, the code would be 12211.

The categories and their elements are derived from the U.S. EPA (1984) groundwater classification modified by fundamentals of the Hawaii ground-water environment. Application of a detailed vulnerability assessment, such as a modified form of DRASTIC, could be used in the Vulnerability to Contamination category.

Brief explanations of the Status Code categories and their elements are as follows.

DEVELOPMENT STAGE. Aquifers are differentiated according to those already being used (Currently Used), those with potential utility (Potential Use), and those having no potential developability.

UTILITY. Identifies aquifers by use. Groundwater classed as Drinking may also be ecologically important, but that classed as ecologically important may not be used for drinking. Drinking takes precedence over ecologically important.

SALINITY. The gradation of groundwater from fresh to seawater is a feature of all basal aquifers in Hawai'i. Basal aquifers comprise, by far, the most voluminous sources of groundwater. Chloride content is the class definer rather than total dissolved solids (TDS) because it is routinely reported in the Hawai'i literature. The class limits inevitably are somewhat arbitrary but incorporate the following logic.

1. Fresh (<250 mg/l): The upper limit of the standard for drinking water is 250 mg/l Cl^- .
2. Low (250-1000 mg/l): Much agriculture, in particular sugarcane, can be irrigated with water containing up to 1000 mg/l Cl^- .
3. Moderate (1000-5000 mg/l): Brackish water of this salinity may serve as feed water for desalinization in the future.
4. High (5000-15,000 mg/l): The high salinity class, not yet seawater, is arbitrarily designated for water that is between potentially economically valuable water and seawater.
5. Seawater: True seawater has a chloride content of 18,980 mg/l.