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July 12, 1999

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

Dear Ms. Salmonson:

Subject: Final Environmental Assessment (EA)
Finding of No significant Impact
Lihue & Hanamaulu Water Development Projects, Phase III
and Hanamaulu Well No. 4 Water Development Project:
Pukaki Well, Hanamaulu Well Nos. 3 & 4, Control Tank,
Control Valve Station and Appurtenances
T.M.K. 3-8-02: portion 2
Lihue, Kauai, Hawaii

The Kauai County Housing Agency and the Department of Water have reviewed the comments received during the 30-day public comment period which began on May 8, 1999. We have determined that the project will not have significant environmental effects and have issued a finding of no significant impact declaration. Please publish the notice of availability in the July 23, 1999 OEQC Environmental Notice. ✓

We have enclosed a completed OEQC Bulletin Publication form, four copies of the final EA, and the project summary on disk. Please call Mr. Dennis Alkire at 808-241-6814 if you have any questions.

Sincerely,

MATILDA A. YOSHIOKA
Director

DENNIS ALKIRE
Project Coordinator

enclosures

c: Ernest Lau, DOW
Keith Fujimoto, DOW

Equal Housing Opportunity

FINAL
ENVIRONMENTAL
ASSESSMENT

LIHUE AND HANAMAULU WATER DEVELOPMENT PROJECTS, PHASE III
and
HANAMAULU WELL NO. 4 WATER DEVELOPMENT PROJECT

Pukaki Well,
Hanamaulu Well Nos. 3 & 4,
Control Tank and Appurtenances

For the:
County of Kauai
HOUSING AGENCY
and
DEPARTMENT OF WATER

July 1999

FUKUNAGA AND ASSOCIATES, INC.
Consulting Engineers
1388 Kapiolani Boulevard, Second Floor
Honolulu, Hawaii 96814
(808) 944-1821

FINAL ENVIRONMENTAL ASSESSMENT

LIHUE AND HANAMAULU WATER DEVELOPMENT PROJECTS, PHASE III and HANAMAULU WELL NO. 4 WATER DEVELOPMENT PROJECT

Pukaki Well,
Hanamaulu Well Nos. 3 & 4,
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For the:
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FINAL ENVIRONMENTAL ASSESSMENT

LIHUE AND HANAMAULU WATER DEVELOPMENT PROJECTS, PHASE III
and
HANAMAULU WELL NO. 4 WATER DEVELOPMENT PROJECT

Pukaki Well, Hanamaulu Well Nos. 3 & 4, Control Tank and Appurtenances

T.M.K. 3-8-02:2
Lihue, Kauai, Hawaii

Proposing Agencies:
County of Kauai
HOUSING AGENCY
and
DEPARTMENT OF WATER

Submitted Pursuant to Chapter 343, HRS

Responsible Official: _____ Date: 7/2999
Matilda A. Yoshioka
Director

Responsible Official: _____ Date: 7/9/99
Ernest Y.W. Lau
Department of Water, Manager & Chief Engineer

Prepared by:
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, Second Floor
Honolulu, Hawaii 96814

July 1999

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APPENDIX

I. INTRODUCTION

A. GENERAL INFORMATION

The County of Kauai Housing Agency (KCHA) and the Department of Water (DOW) desire to construct three new water source development projects in the Lihue area to improve the existing water system capabilities to meet the growing needs. The three wells, Pukaki Well and Hanamaulu Well Nos. 3 and 4, are within 1 mile of each other, and are located over the same aquifer. See **Figure 1**.

This environmental assessment evaluates the final phase, Phase III, of two projects identified as the Lihue Water Development Project – Pukaki Well, KCHA Project No. 5699 (DOW Project No. 96-1) and the Hanamaulu Water Development Project – Hanamaulu Well No. 3, KCHA Project No. 5702 (DOW Project No. 96-2). In addition, this environmental assessment evaluates the drilling, casing, testing and anticipated development of an additional well, Hanamaulu Well No. 4, DOW No. Project 98-30.

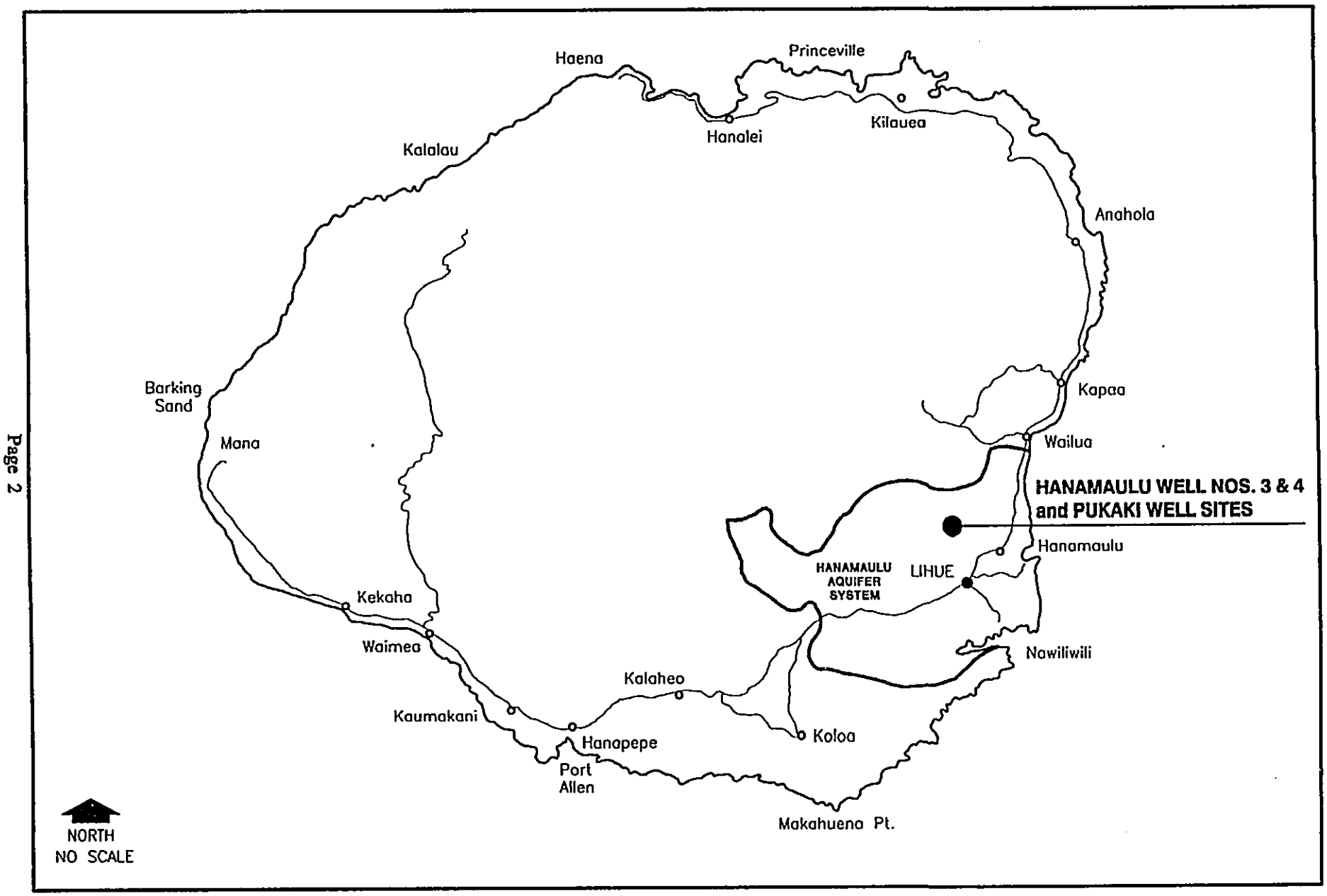
The Finding of No Significant Impact (FONSI) for the Lihue and Hanamaulu Water Development Projects were published for Phases I and II. The FONSI for Phase I, which included the drilling, casing, and testing of Pukaki Well and Hanamaulu Well No. 3 was published on May 8, 1997. Phase II included the 16-inch transmission main from the proposed control tank (part of Phase III) connecting to the existing distribution system, and the 8-inch main connecting Pukaki Well to the 16-inch transmission main. The FONSI for Phase II was published on August 23, 1998. Phase III of the Lihue and Hanamaulu Water Development Projects covers development of the two wells, construction of the control tank and control valve station connection to the 16-inch transmission main (Phase II), and electrical control modifications. The segmentation of the environmental assessment for Phases II and III was necessary due to expiring funds and separate design and construction schedules.

B. PROPOSING AGENCY

The proposing agencies for the projects are the County of Kauai Housing Agency and the Department of Water.

II. PURPOSE OF THE PROJECTS

The three phases of the Lihue and Hanamaulu Water Development Projects and the Hanamaulu Well No. 4 Development Project involve development of three deep well water sources, control tank, control facilities, an 8-inch transmission main, a 16-inch transmission main, and minor electrical control modifications at the existing Hanamaulu and Kilohana Reservoirs as shown in **Figure 2**. The proposed projects will supplement the 393' service zone of the Lihue Water System which is comprised of six deep wells at Kilohana, four 1

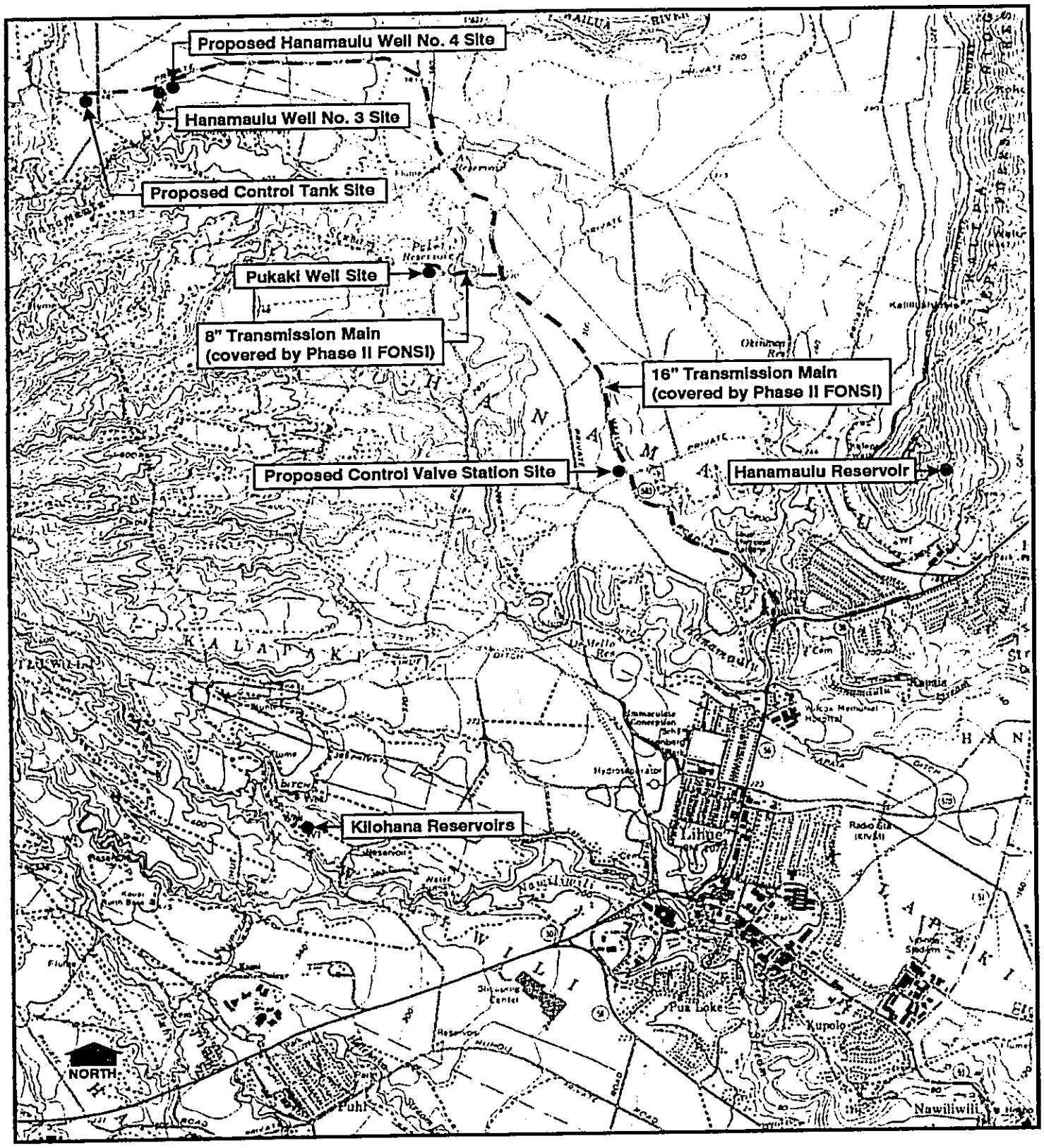


COUNTY OF KAUAI

ISLAND OF KAUAI

Lihue and Hanamaulu Water Development Projects

FIGURE 1



LOCATION MAP

COUNTY OF KAUAI

Lihue and Hanamaulu Water Development Projects

FIGURE 2

million gallon (MG) storage reservoirs (two Kilohana Reservoirs, one Puhi Reservoir, and one Hanamaulu Reservoir) and associated transmission and distribution mains. The current well capacity serving the Lihue System is approximately 2.32 mgd based on a 16-hour operating period. The system is also supplemented with water from two other water systems, Puhi and Wailua Water Systems. Based on the 1990 *Kauai Water Use and Development Plan*, the DOW will need to supply the Lihue Water System with 4.94 mgd by the year 2010.

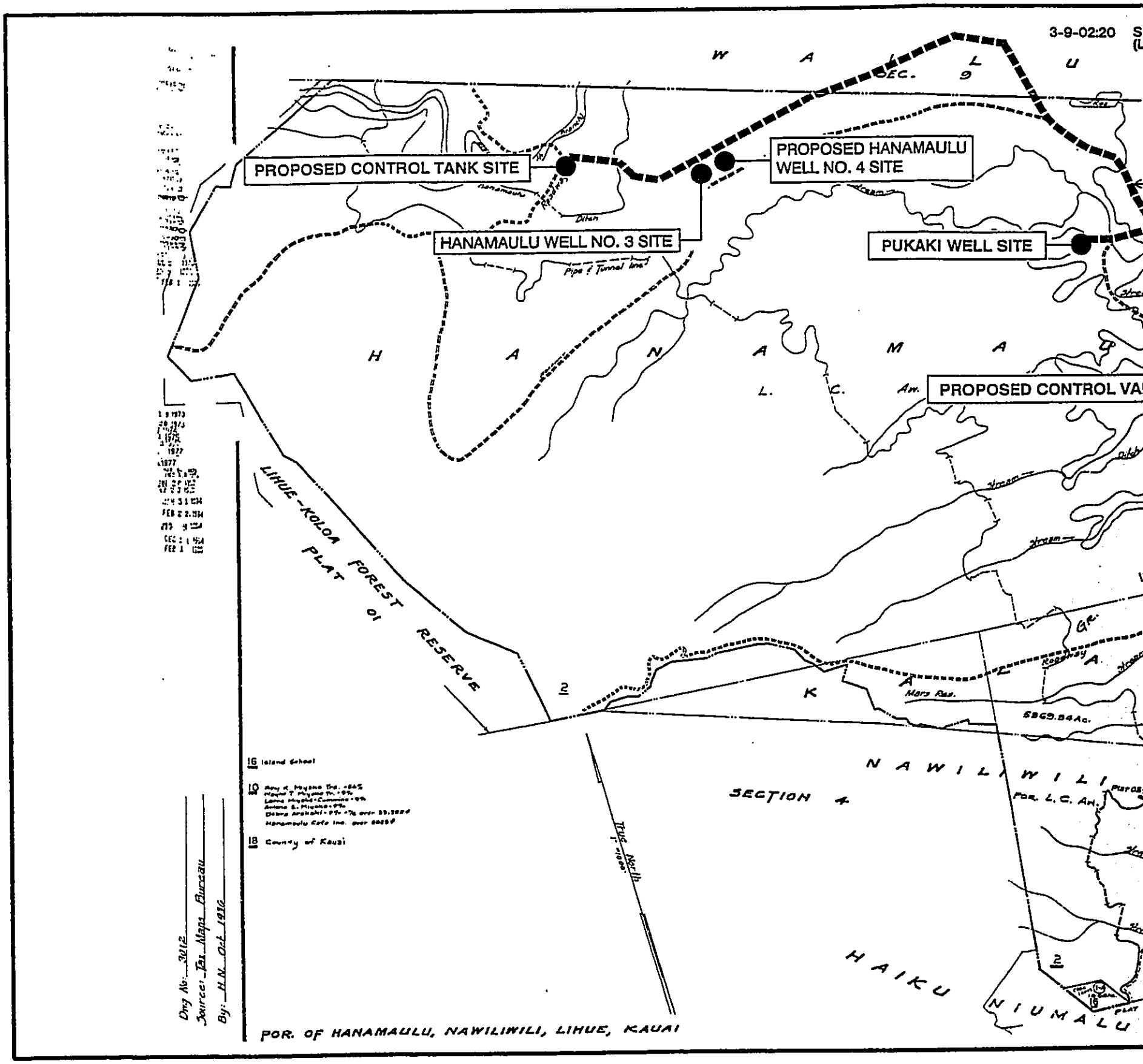
The Lihue and Hanamaulu Water Development Projects and the Hanamaulu Well No. 4 Development Project were initiated because growth and expansion of the Lihue service area have generated potable water demands that exceed the capacities of the existing well sources. Additionally, existing pumpage has been reduced by more than 20 percent because of dropping well water levels. Consequently, the Department of Water is currently restricting water requests for developments and subdivisions in the Hanamaulu area until additional source and storage facilities are developed. The development of additional potable water sources for the Lihue Water System has been given the highest priority.

III. LIHUE WATER DEVELOPMENT – KCHA PROJECT NO. 5699 (DOW PROJECT NO. 96-1)

A. LIHUE WATER DEVELOPMENT PROJECT LOCATION

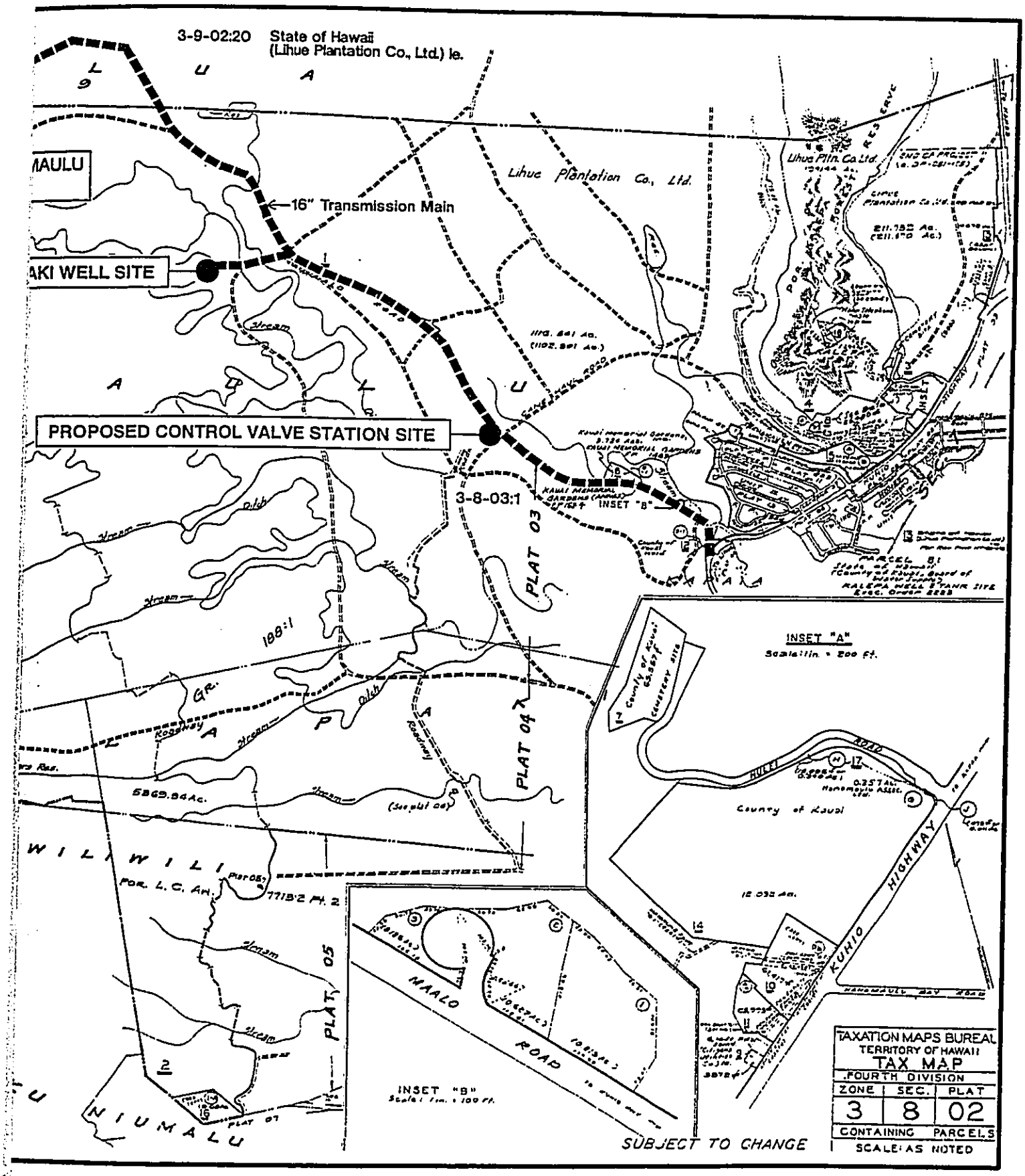
The Pukaki Well site is located approximately 3 miles northwest of Lihue, 0.1 miles west of Pukaki Reservoir (part of Hanamaulu Stream), 0.5 miles south of Aii Reservoir, and 0.7 miles southeast of Kapaia Reservoir. The project site is on lands owned by Lihue Plantation Company, Ltd., and identified by TMK 3-8-02:2. See **Figures 2** and **3**. Pukaki Well has been designated as State Well No. 0023-02, and was constructed in July 1998. Pumping test results indicate that Pukaki Well is capable of supplying about 130 gpm with a drawdown of 206 feet. Pump test data are included in **Appendix A1**.

Following construction of the well source improvements, the Pukaki Well project site will be subdivided from Lihue Plantation Company lands, and the County of Kauai will become the legal owners of the well site. Access and utility easements will also be obtained.



COUNTY OF KAUAI

Lihue and Hanamaulu Water Development Projects



TAX MAP KEY: 3-8-02:2

FIGURE 3

B. PROPOSED PROJECT

Developing Pukaki Well into a production well will involve the installation of a line shaft vertical turbine pump (pump rating at 120 gpm) with a water pre-lubrication system, pump discharge piping, the construction of a pump control building, pump controls and appurtenances, chlorination facilities, radio telemetry link to the control tank, and electrical work. Other improvements to the well site include a drainage system, fencing, and asphalt concrete paving.

A Special Purpose Grant from the Department of Housing and Urban Development will fund the proposed Lihue Water Development Project. There are no restrictions on the water allocation for the project.

IV. HANAMAULU WATER DEVELOPMENT PROJECT NO. 5702 (DOW PROJECT NO. 96-2)

A. HANAMAULU WATER DEVELOPMENT PROJECT LOCATION

The Hanamaulu Water Development Project includes the following three sites:

- Hanamaulu Well No. 3
- Control Tank
- Control Valve Station

The Hanamaulu Well No. 3 site is located approximately 4 miles northwest of Lihue, and 0.2 miles northwest of Kapaia Reservoir. The control tank site is approximately 2,000 feet west of the well site, and the site for the control valve station is about 2 miles makai, off Maalo Road. The project sites are on lands owned by Lihue Plantation Company, Ltd., and identified by TMK 3-8-02:2. See **Figures 2** and **3**.

Hanamaulu Well No. 3 has been designated as State Well No. 0124-02, and was constructed and tested from August through October 1998. Pumping test results indicate Hanamaulu Well No. 3 is capable of supplying about 160 gpm with a drawdown of 345 feet. Pump test data are included in **Appendix A2**.

Following construction of the well source improvements, the Hanamaulu Well No. 3, control tank and control valve station sites will be subdivided from Lihue Plantation Company lands, and the County of Kauai will become the legal owners of the sites. Access and utility easements will also be obtained.

B. PROPOSED PROJECT

The Hanamaulu Water Development Project includes developing Hanamaulu Well No. 3, constructing the control tank and control valve station, and minor electrical control modifications at the existing Kilohana and Hanamaulu Reservoirs.

1. Developing Hanamaulu Well No. 3 into a production well will involve the installation of a line shaft vertical turbine pump (pump rating at 160 gpm) with a water pre-lubrication system, pump discharge piping, the construction of a pump control building, pump controls and appurtenances, chlorination facilities, radio telemetry to the control tank, and electrical work. Other improvements to the well site include a drainage system, fencing, and asphalt concrete paving.

2. The 100,000 gallon stainless steel control tank is proposed to be located on a site approximately 2,000 feet west of the Hanamaulu Well No. 3 site (see **Figure 2**), and would control the pump start and stop operations at Hanamaulu Well No. 3, Pukaki Well and future wells in the vicinity. Other improvements to the well site include a drainage system, fencing, and asphalt concrete paving.

3. The Control Valve Station is proposed to be located on a site approximately 2 miles southeast of the control tank site (see **Figure 2**). The control valve station would control flow out of the control tank and would be linked by radio telemetry to the control tank, and Kilohana and Hanamaulu Reservoirs. The control valve station would consist of above ground piping, valves, fittings, and appurtenances, fencing and asphalt concrete paving.

The Hanamaulu Water Development Project will serve the low and moderate income residents of the Hanamaulu community, and will be funded by a Community Development Block Grant from the Department of Housing and Urban Development. The water produced by Hanamaulu Well No. 3 will be allocated to the Hanamaulu community.

V. HANAMAULU WELL NO. 4 DEVELOPMENT PROJECT - DOW PROJECT NO. 98-30

A. HANAMAULU WELL NO. 4 DEVELOPMENT PROJECT LOCATION

The proposed Hanamaulu Well No. 4 project site is adjacent to the existing Hanamaulu Well No. 3 site. Similarly, the project site is on lands owned by Lihue Plantation Company, Ltd., and identified by TMK 3-8-02:2. See **Figures 2** and **3**.

Upon successful completion of the well drilling and testing, and construction of the well source improvements, the Hanamaulu Well No. 4 project site will be subdivided from

Lihue Plantation Company lands, and the County of Kauai will become the legal owners of the sites. Access and utility easements will also be obtained as required.

B. USGS INFORMATION

The U.S. Geological Survey (USGS) drilled and cased the Northeast Kilohana monitor well during the period from June 6 to August 1995 to study the hydrology and geology of the area. The ground elevation at the well is 466.42 feet. The well is 10 inches in diameter by 1,047 feet deep (bottom is at –581 feet elevation), and is cased with 4-inch steel pipe (alternating sections of solid and perforated walls) down to –566 feet elevation. During seven days of sustained pumping at an average rate of 316 gallons per minute, the maximum drawdown was 49.54 (initial static water level elevation was 375.5 feet).

C. PROPOSED PROJECT

The proposed Hanamaulu Well No. 4 site is located approximately 150 feet northeast of the existing Hanamaulu Well No. 3, and as close as practicable to the existing USGS well.

The proposed project will occur in two phases, which include the following major tasks:

Phase I

1. Drilling and casing the well.
2. Pump testing the aquifer at a rate up to 700 gallons per minute (gpm). Anticipated flow rate is 300 gpm.
3. Obtaining water quality data and analyses in accordance with the Department of Health, Hawaii Administrative Rules, Title 11, Chapter 20 requirements.

The well design documents will conform with the Department of Land and Natural Resources (DLNR) well construction standards and will address best management practices. The time anticipated to complete the drilling, casing and testing is 6 months. The estimated cost is $600,000.

Phase II

Developing Hanamaulu Well No. 4 into a production well will involve the installation of a line shaft vertical turbine pump (pump rating anticipated to be 300 gpm) with a water pre-lubrication system, pump discharge piping, pump controls and appurtenances, radio telemetry link to the control tank, and electrical work. The control building on the Hanamaulu Well No. 3 site will also serve the proposed Hanamaulu Well No. 4. The chlorination facilities and a portion of the controls housed in the control building will be shared by the two wells. Other

improvements to the well site include connecting to the Hanamaulu Well No. 3 drainage system, fencing, and asphalt concrete paving.

VI. DESCRIPTION OF THE ENVIRONMENT - COMMON TO THE PROJECTS

A. LAND CLASSIFICATION AND ZONING

State and County laws and regulations govern Land use policies. The State Land Use Commission classifies all State lands as Urban, Rural, Agricultural, or Conservation with the intent to accommodate growth and development and to retain the natural resources of the area. More detailed land use zoning for the State designated land classifications is regulated by the Comprehensive Zoning Ordinance (CZO) for the County of Kauai. County zoning designations include:

A	Agriculture
O	Open
PF	Public Facilities
R	Resort
RR	Rural Residential
UR	Urban
UMU	Urban Mixed Use

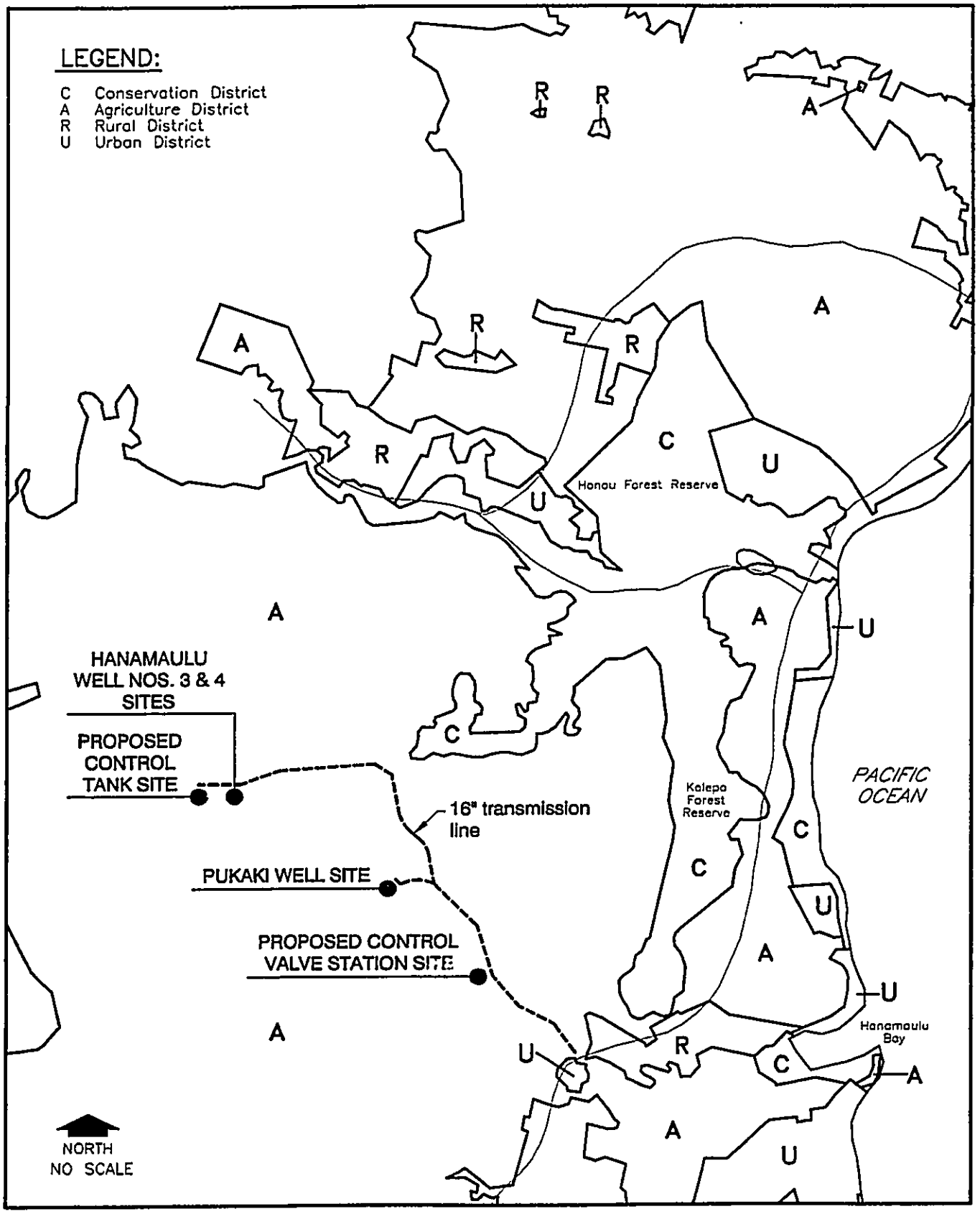
The project sites are located on lands that have been designated for Agriculture by both the State Land Use Commission and the County General Plan. See **Figures 4** and **5** for zone designations. The Kauai Planning Commission during the public hearing held November 24, 1998 approved a land use and zoning permit.

B. PHYSICAL FEATURES

1. Topography

The Pukaki Well site is on a knoll in sugar cane fields, and adjacent to an existing private cane haul road.

The Hanamaulu Well No. 3, proposed Hanamaulu Well No. 4, and control tank sites are located on relatively flat areas currently used for cultivating sugar cane, and adjacent to an existing private cane haul road. A small irrigation ditch which flows to Kapaia Reservoir lies to the east of the well sites. A ravine lies to the west of the control tank site.

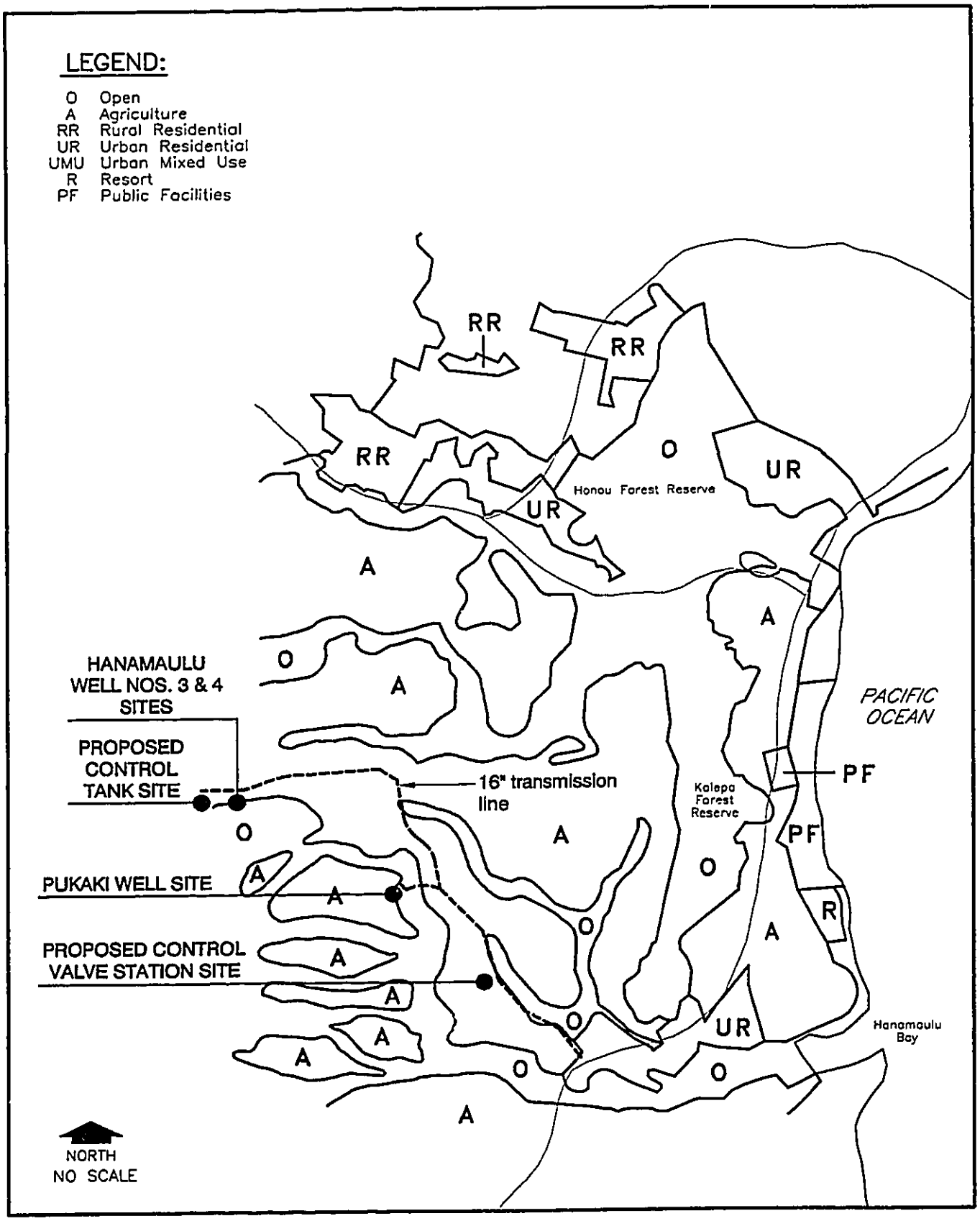


COUNTY OF KAUAI

STATE LAND USE MAP

Lihue and Hanamaulu Water Development Projects

FIGURE 4



COUNTY OF KAUAI

KAUAI COUNTY GENERAL PLAN

Lihue and Hanamaulu Water Development Projects

FIGURE 5

The control valve station site is also relatively flat, and was formerly used for sugar cane. A well was drilled on the site, but testing indicated a low well yield and plans for development are indefinite. The site is surrounded by sugar cane fields, and is bound by an irrigation ditch and Maalo Road on the East Side and a cane haul road on the south side.

2. Soils

According to the *Soil Survey* issued in 1972 by the U.S. Department of Agriculture Soil Conservation Service (USDA-SCS), the soil in the area surrounding the well sites and proposed control tank site are characterized as Kapaa silty clay, 3 to 8 percent slopes (KkB). The soil type is acidic, provides slow runoff, and there is little erosion hazard. The soil at the proposed control valve station site is characterized as Puhi silty clay loam, 3 to 8 percent slopes (PnB). The soil type also is acidic, provides slow runoff, and the erosion hazard is slight. See **Figure 6**.

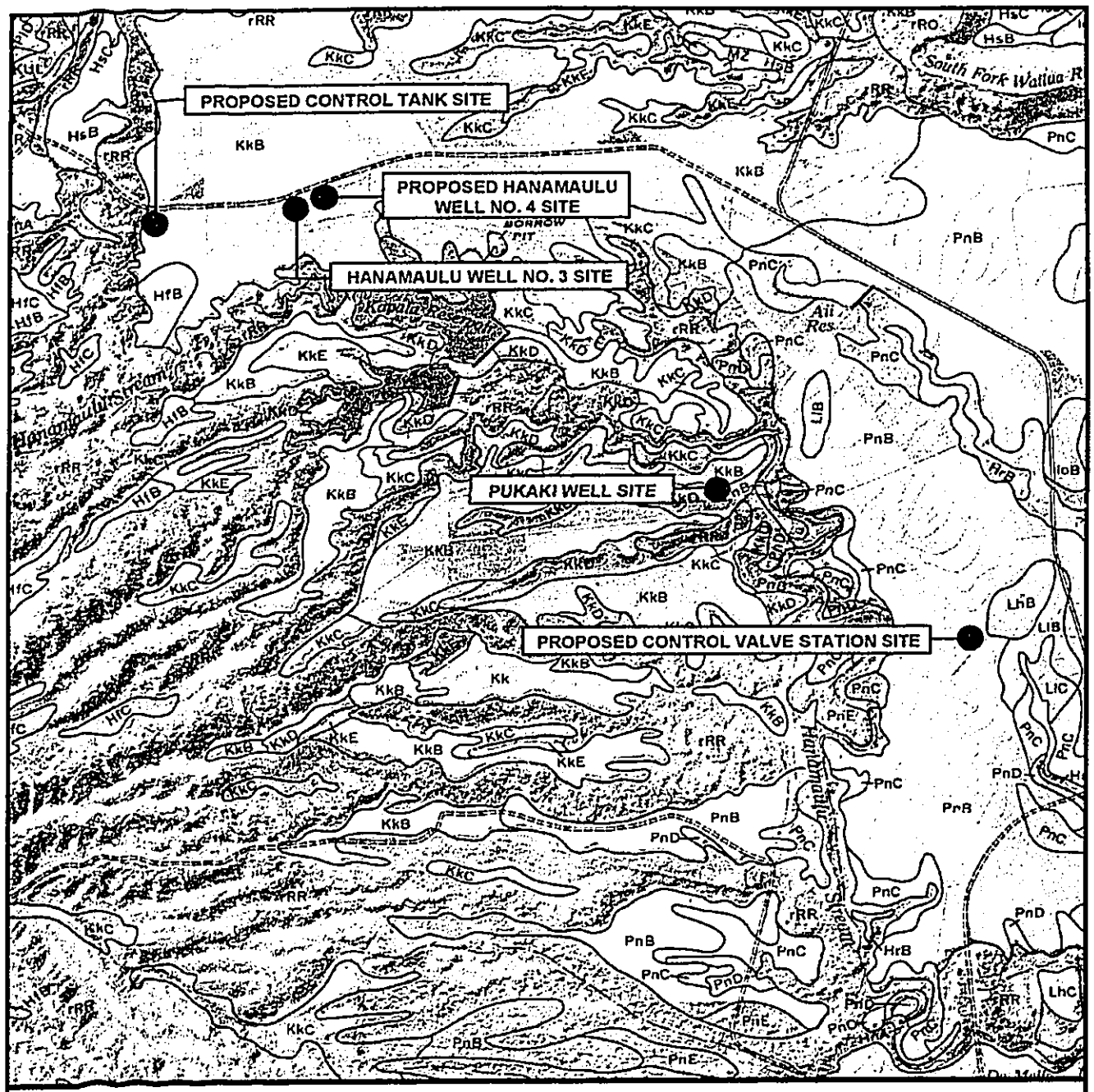
3. Hydrogeology (*Reference: Molokoa Hydrologic Study, January 1995*)

The hydrogeologic study area covers most of the area designated as the Hanamaulu Aquifer System by the State Commission on Water Resource Management (1990). The aquifer system extends in an east-west direction from Waialeale-Kahili Mountains west of Lihue Town to Hanamaulu Bay, and in a north-south direction from Wailua River to Haupu Ridge. See **Figures 7** and **8**. The study area is situated in the "Lihue Depression," a large somewhat circular geologic feature in the eastern part of the island, bounded by the Waialeale-Kahili Mountains on the west, Makaleha Mountain on the north, Kalepa Ridge on the east and Haupu Ridge on the south.

a. Volcanic Activity

The "Lihue Depression" was formed by a collapse on the eastern slopes of Kauai during the shield-building period more than two million years ago (Waimea Canyon volcanic series). A long period of erosion followed the shield-building period and the island became deeply eroded. Kalepa Ridge and Haupu Ridge are outlying remnants of the thin-bedded Waimea Canyon lavas (Napali formation). A major stream cut the now-buried deep erosional gap between Kalepa and Haupu Ridges.

Volcanic activity resumed with the eruption of the Koloa volcanic series. Lavas of the Koloa volcanic series were more massive and less permeable than the Napali formation, and buried much of the eastern half of the island.



SOURCE:
Soil Survey of Island of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, U.S. Department of Agriculture, Soil Conservation Services, August 1972.

LEGEND:

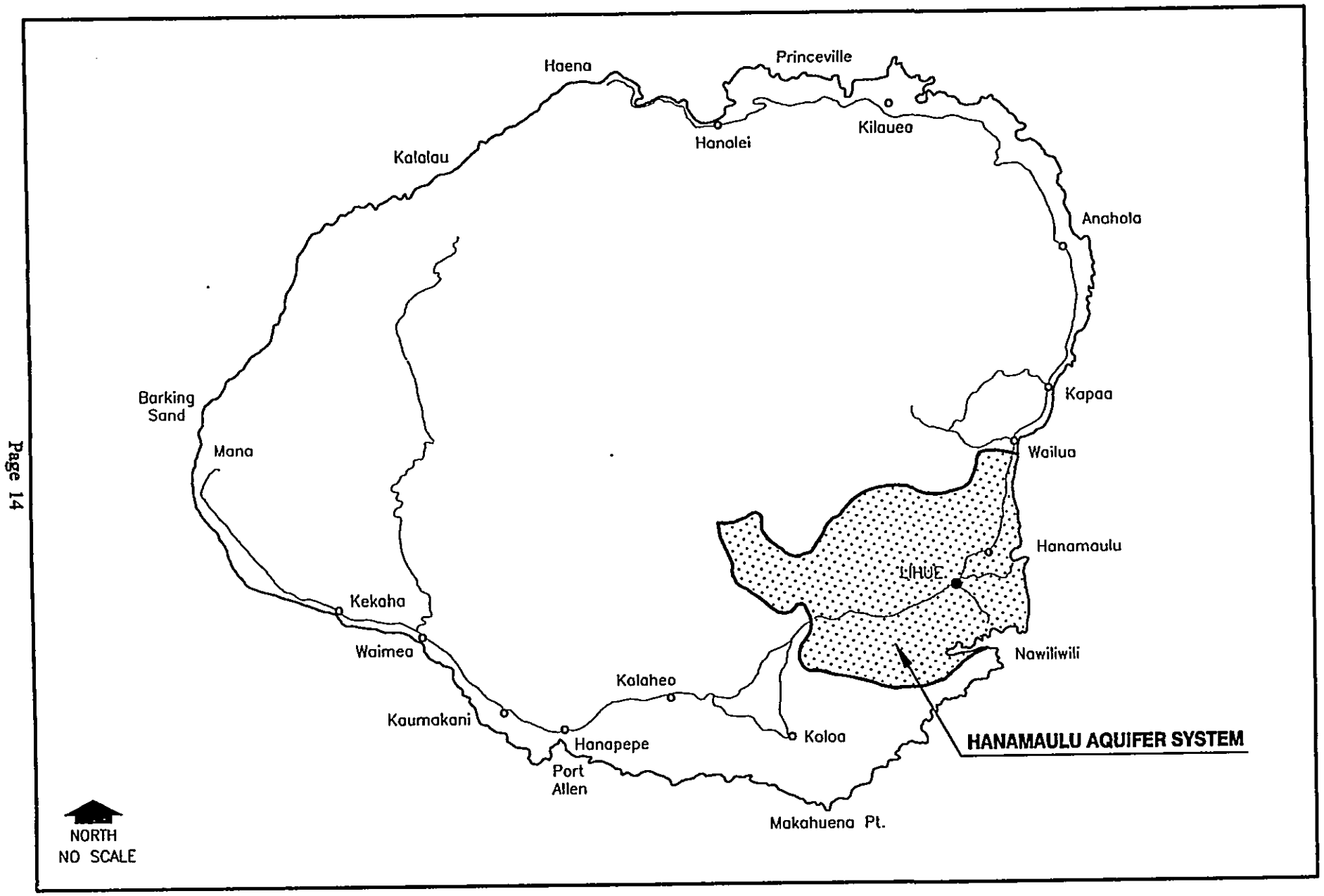
HfB	Halii gravelly silty clay, 3-8% slopes	LhB	Lihue silty clay, 0-8% slopes
HfC	Halii gravelly silty clay, 8-15% slopes	LhC	Lihue silty clay, 8-15% slopes
HrB	Hanalei silty clay, deep water table	L1C	Lihue gravelly silty clay, 8-15% slopes
HsB	Hanamaulu silty clay, 3-8% slopes	Llb	Lihue gravelly silty clay
HsC	Hanamaulu silty clay, 8-15% slopes	MZ	Marsh
HnA	Hanalei silty clay, 0-2% slopes	PnB	Puhi silty clay loam, 3-8% slopes
loB	Ioleau silty clay loam, 2-6% slopes	PnC	Puhi silty clay loam, 8-15% slopes
KkB	Kapaa silty clay, 3-8% slopes	PnD	Puhi silty clay loam, 15-25% slopes
KkC	Kapaa silty clay, 8-15% slopes	PnE	Puhi silty clay loam, 25-40% slopes
KkD	Kapaa silty clay, 15-25% slopes	rRR	Rough broken land
KkE	Kapaa silty clay, 25-40% slopes		

COUNTY OF KAUAI

USDA/SCS SOIL MAP

Lihue and Hanamaulu Water Development Projects

FIGURE 6

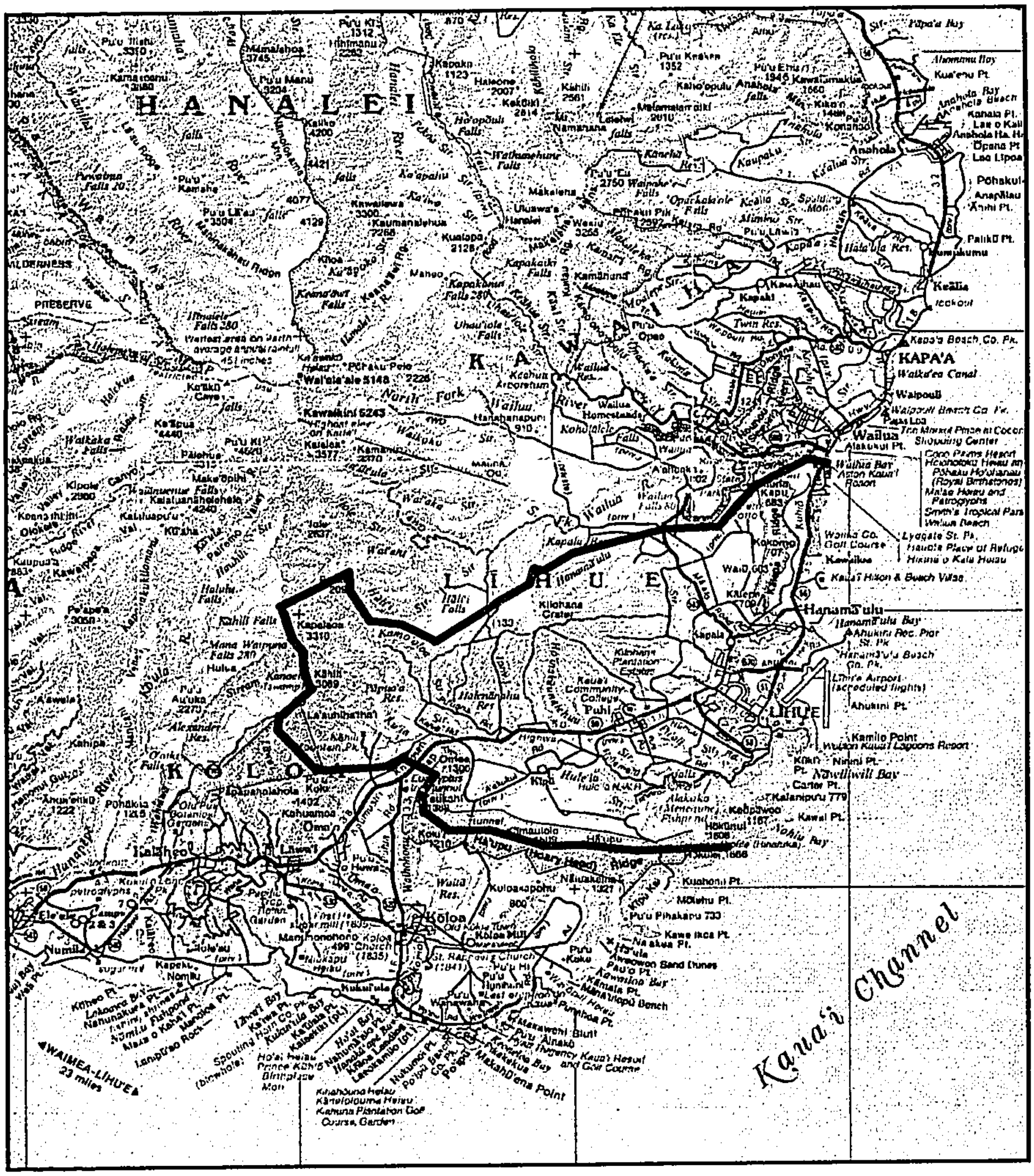


COUNTY OF KAUAI

Lihue and Hanamaulu Water Development Projects

ISLAND OF KAUAI - HYDROLOGIC UNITS

FIGURE 7



COUNTY OF KAUAI

HANAMAULU AQUIFER SYSTEM

Lihue and Hanamaulu Water Development Projects

FIGURE 8

In the "Lihue Depression" a small subsidiary shield volcano developed from Kilohana Crater. Lava flows and ash deposits gradually filled the southern half of the depression, flowing seaward around the southern end of Kalepa Ridge and building the gentle ground slopes of the Lihue Town area.

b. High-Level Groundwater

High-level groundwater results from the combination of high rainfall and overall low permeability of the Koloa lavas. Theories on the cause of the high-level groundwater differ. The high-level may result from bodies of water perched on beds of relatively low permeability lavas, soil and ash (*Molokoa Hydrologic Study*), or the high-level may be part of a completely saturated groundwater system (*USGS Ground Water in the Southern Lihue Basin, Kauai, Hawaii,* 1998). High-level groundwater was first confirmed by a deep exploratory well drilled in 1961 at the old Lihue Grammar School site. Groundwater elevation measurements in the exploratory well during drilling revealed a 438-foot thick body of fresh high-level groundwater extending to a depth of 248 feet below mean sea level. A number of test holes about 1.5 miles mauka of the exploratory well also confirmed the occurrence of high-level groundwater.

c. Basal Groundwater

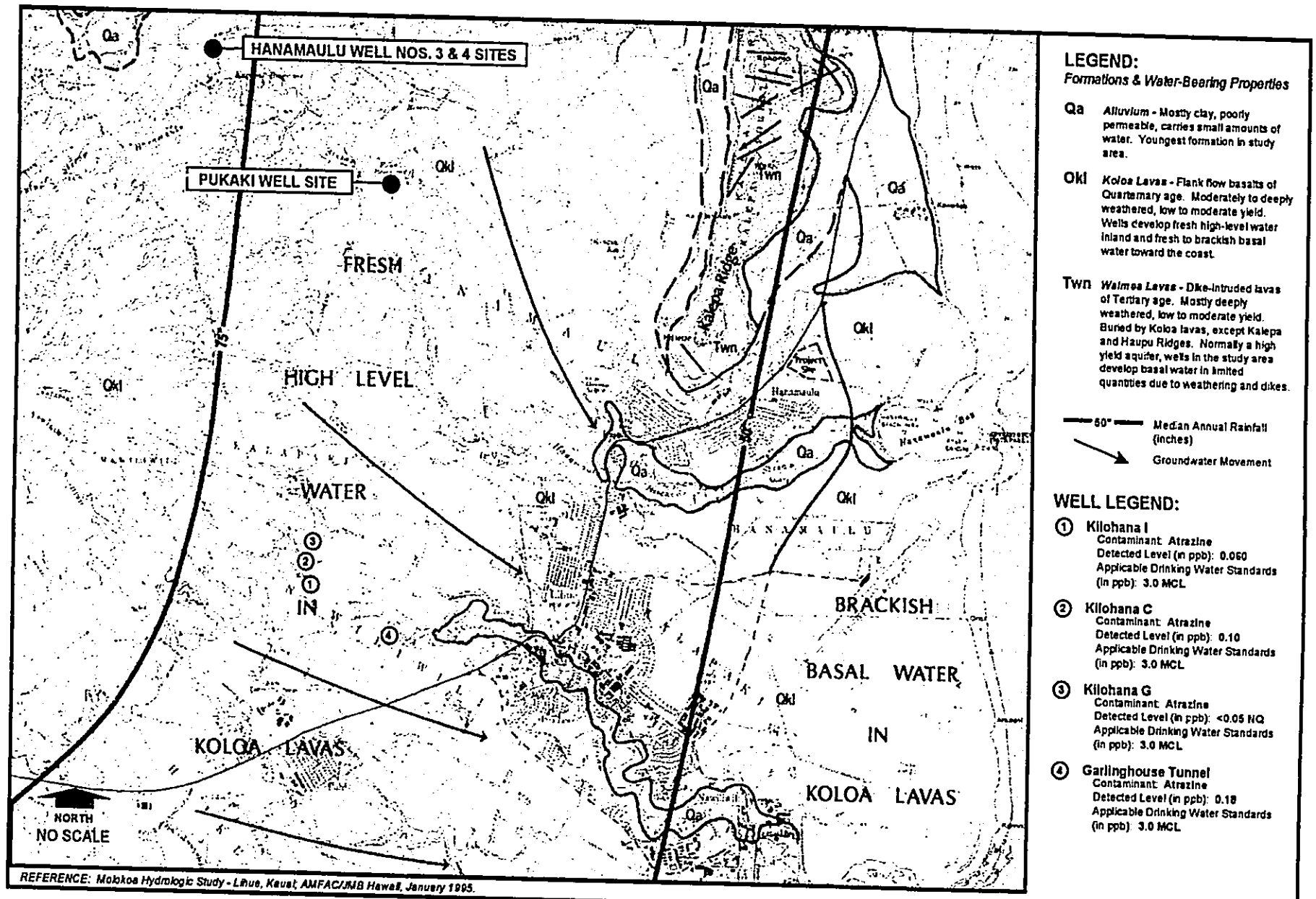
The 1961 investigations and measurements at the old Lihue Grammar School exploratory well also determined the occurrence of basal groundwater in the underlying layers of the high-level groundwater. The top of the basal aquifer was determined to be approximately 180 feet to 248 feet below mean sea level.

d. Regional Groundwater Movement

The general movement of groundwater in the study area is eastward and southeastward. See **Figure 9**. Groundwater in the northern part of the study area was determined to move mostly southward toward Lihue, but some may move northward toward Wailua River.

e. Estimated Groundwater Yield

According to the *State Water Resources Protection Plan, Vol. I and II* (June 1990), the Hanamaulu Aquifer System receives an average rainfall volume of 217 million gallons per day (mgd), of which about 48% is lost to evapotranspiration, 16% is lost to runoff, and 36% or 79 mgd becomes groundwater. The sustainable yield of the Hanamaulu Aquifer System has been estimated at approximately 40 mgd.



LEGEND:

Formations & Water-Bearing Properties

Qa *Alluvium* - Mostly clay, poorly permeable, carries small amounts of water. Youngest formation in study area.

Okl *Koloa Lavas* - Flank flow basalts of Quaternary age. Moderately to deeply weathered, low to moderate yield. Wells develop fresh high-level water inland and fresh to brackish basal water toward the coast.

Twn *Waimea Lavas* - Dike-intruded lavas of Tertiary age. Mostly deeply weathered, low to moderate yield. Buried by Koloa lavas, except Kalepa and Haupu Ridges. Normally a high yield aquifer, wells in the study area develop basal water in limited quantities due to weathering and dikes.

—50"— Median Annual Rainfall (inches)

Groundwater Movement

WELL LEGEND:

① **Kilohana I**
Contaminant: Atrazine
Detected Level (in ppb): 0.050
Applicable Drinking Water Standards (in ppb): 3.0 MCL

② **Kilohana C**
Contaminant: Atrazine
Detected Level (in ppb): 0.10
Applicable Drinking Water Standards (in ppb): 3.0 MCL

③ **Kilohana G**
Contaminant: Atrazine
Detected Level (in ppb): <0.05 NQ
Applicable Drinking Water Standards (in ppb): 3.0 MCL

④ **Garlinghouse Tunnel**
Contaminant: Atrazine
Detected Level (in ppb): 0.18
Applicable Drinking Water Standards (in ppb): 3.0 MCL

COUNTY OF KAUAI

REGIONAL GROUNDWATER MOVEMENT & GROUNDWATER CONTAMINATION

Lihue and Hanamaulu Water Development Projects

FIGURE 9

f. Existing Wells and Water Use

The existing producing potable water wells within the Hanamaulu Aquifer are listed in the following table. The domestic potable water consumption for 1996 supplied by the Lihue Water System (County of Kauai) was approximately 2.74 mgd.

Name	Primary Source	Standby Source	State Well No.	Aquifer	Pump Capacity (mgd)	1996 Water Use (mgd)
Kauai County Department of Water:						
Garlinghouse Tunnel	X		5823-01	High-Level	1.152	
Kilohana A		X	5923-01	Basal	0.59	
Kilohana B	X		5923-02	High-Level	1.008	
Kilohana C	X		5923-03	High-Level	0.144	
Kilohana F		X	5923-04	High-Level	0.576	
Kilohana G	X		5923-05	High-Level	0.216	
Kilohana I	X		5923-07	High-Level	1.008	
Kokolau Tunnel ♣	X		5725-01	High-Level	0.432	
Old Grammar School	X		5822-02	Basal	0.216	
Puhi 1	X		5824-01	Basal	0.288	
Puhi 2		X	5824-03	High-Level	0.144	
Puhi 3	X		5824-05	High-Level	0.432	
Kalepa Ridge Well ♦	X		5921-01	Basal	0.173	
TOTAL					6.379	2.72
Lihue Plantation Company:						
Sugar Mill ♠			5822-01	Basal	0.53	0.30

♣ Kokolau Tunnel presently not in use.
♦ Kalepa Ridge Well currently in use.
♠ 1991 data. Per Lihue Plantation, potable well not verified.

4. Climate

Annual rainfall within the vicinity of the wells ranges between 70 and 80 inches per year. The temperature ranges from an average high of 80°F to an average low of

65°F. The northeasterly trade winds, which prevail throughout the year, result in winds with velocities averaging 20 miles per hour.

5. Flood and Tsunami

The Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) panel 150002 0140C dated March 4, 1987, designates the well sites within Zone X, areas determined to be outside of the 500-year flood plain. Therefore, impact of the projects on the flood zones is not expected.

C. WATER QUALITY

Water quality analyses for Pukaki Well and Hanamaulu Well No. 3 were performed in accordance with the Department of Health, Hawaii Administrative Rules, Title 11, Chapter 20, *Potable Water System Rules*. Additional water quality data are available for wells within the vicinity which include the USGS Pukaki Reservoir monitor well (near Pukaki Well and about 1 mile southeast of the Hanamaulu Well No. 3 site) and the Northwest Kilohana monitor well (about 2 miles west of the Hanamaulu Well No. 3 site). Data are not available for the USGS Northeast Kilohana monitor well (located near Hanamaulu Well No. 3). Refer to the **Appendix B** for water quality data.

Pukaki Well, Hanamaulu Well No. 3 and the proposed Hanamaulu Well No. 4 are located in the midst of existing sugar cane fields, and are subject to potential contamination from the leaching of fertilizers and herbicides used in cultivation. Nitrate, a good indicator of contamination by fertilizers, was found to occur at very low concentrations for Pukaki Well, Hanamaulu Well No. 3 and nearby wells as listed in the following table. These concentrations are well within the maximum contaminant level (MCL) of 10 mg/l (nitrate-nitrogen).

Atrazine, an herbicide, has been reported at less than 0.00005 to 0.0002 mg/l in the Kilohana Wells I, C, and G, and at the Garlinghouse Tunnel, and a trace level of 0.00006 mg/L atrazine was detected at Hanamaulu Well No. 3. See **Figure 9**. These values are well below the maximum contaminant level of 0.003 mg/l (State CWRM, Water Quality Plan, 1992, p. III-19, and the Department of Health Administrative Rules Chapter 11-20, 1992). Water quality analyses for Pukaki Well, Pukaki Reservoir and Northwest Kilohana monitor wells did not find atrazine at detectable levels. Chromium, mercury, and diethylphthalate were detected in some of the wells as listed in the following table, but levels are well below the MCL.

Dichloromethane was initially detected in both Pukaki Well and Hanamaulu Well No. 3. Dichloromethane is a laboratory solvent used during water quality analyses; therefore, another sample was obtained from each well and analyzed. Dichloromethane was not detected in either well.

Contaminants	MCL	Pukaki Well	Hanamaulu Well No. 3	USGS Pukaki Reservoir Well	NW Kilohana Monitor Well
Nitrate-N (mg/L)	10	0.23	1.2	0.2	0.1
Chromium (mg/L)	0.1	0.0074	0.0058	0.007 & 0.011	0.014
Mercury (mg/L)	0.002	0.0003	ND	ND	ND
Methylene chloride (mg/L)	0.005	0.0136	0.0015	ND	ND
Diethylphthalate (mg/L)	0.006	0.0007	0.0006	ND	ND
Atrazine (mg/L	0.003	ND	0.00006	ND	ND

ND: Not Detected

Pukaki Well and Hanamaulu Well No. 3 waters meet the chemical safe drinking water standards. Biological test results do not meet the DOH requirements; however, it is likely that the water samples were contaminated and did not accurately represent the water quality. The proposed Hanamaulu Well No. 4 water quality is anticipated to be similar to Hanamaulu Well No. 3 results. Additional sampling and testing will be done after the wells are developed, and will be monitored by the DOH.

D. ARCHAEOLOGICAL AND HISTORICAL CONSIDERATIONS

The project sites are located in the middle of cultivated cane fields. The State Historic Preservation Division records indicate that there are no known archeological sites at the project locations. If construction work uncovers any archaeological remains, work will cease and an archaeological survey will be conducted.

E. FLORA

The surrounding vegetation for miles around is cultivated sugar cane. The lands are highly disturbed, and the existence of endangered species in the project area is unlikely.

F. FAUNA

Animals found in the area include field mice, rats, geckos, and small feral animals. Birds include doves of various kinds, mynahs, cardinals, and pheasants. Amphibians such as toads and frogs are also found in the area. The project sites are highly disturbed, and it is unlikely that any rare or endangered species of animal life inhabit the areas.

VII. PROBABLE IMPACTS AND MITIGATIVE MEASURES – COMMON TO THE PROJECTS

A. SHORT TERM IMPACTS

1. Air Quality

There will be an increase in dust and vehicular exhaust emissions in the vicinity of the project areas during construction. Dust control measures will be used to reduce dust if it becomes a problem. Exhaust emission should not have any significant effect on the area because prevailing winds should disperse any exhaust gas concentration.

2. Erosion

The five sites will be graded; disturbed areas will either be paved or grassed. The Contractor will be required to implement erosion and sediment control measures during construction. Grading and soil disturbance will be minimized, and areas that are disturbed will be properly graded and revegetated to prevent erosion. The Contractor will be instructed to minimize the time of construction, retain ground cover until the latest practicable date to complete construction, and construct drainage control features early in the construction time schedule. Continued maintenance will be required for nine months from the accepted completion date of the planting period to ensure proper revegetation.

3. Excess Water Discharge

Disposal of excess water generated from hydrotesting and chlorination of the project components, and storm water runoff will be accomplished by the Contractor in compliance with all applicable National Pollutant Discharge Elimination System (NPDES) requirements.

4. Traffic

Traffic will increase due to the construction activities along Maalo Road and along the private cane haul roads used by Lihue Plantation Company. The increased traffic will be temporary only lasting the length of the construction period. Disruptions to Lihue Plantation Company operations by the traffic will be minimized through conscientious efforts by the Contractor to confine the construction activities to a limited area.

5. Noise

There will be an increase in noise from the construction activity. However, the increased noise should not have any adverse impacts since the construction area is isolated in the middle of cane fields and a few miles from any residential area. All

noise generated by the construction activity shall conform to the noise regulations established by the State Department of Health.

B. LONG TERM IMPACTS

Long term impacts are generally those impacts related to the operation of the proposed water development projects. Any potential negative long term impacts associated with the implementation of the projects will be mitigated by appropriate and low profile design, and competent, efficient, and effective operations and maintenance.

1. Land Use

The Pukaki Well, Hanamaulu Well No. 3, proposed Hanamaulu Well No. 4, control tank, and control valve station sites are designated for Agriculture by the State Land Use Commission. The total land area required for the sites is less than one acre; therefore, the well development projects will not have significant negative impacts on agricultural lands.

2. Hydrology

a. Surface Water

The proximity of the Pukaki Well site to the drainage ditch and Pukaki Reservoir, and the proximity of the Hanamaulu Well Nos. 3 and 4 sites to the irrigation ditch and Kapaia Reservoir indicate the possibility of surface water contamination and streamflow reduction. The design and construction of the wells address these concerns.

The operation of the deep well pumps requires the discharge of air and flushing water before the well water can be conveyed to the control tank. The air and flushing water from the Pukaki Well site would be discharged to a subsurface seepage drain. The air and flushing water from the Hanamaulu Well Nos. 3 and 4 sites would be discharged to the nearby unlined irrigation ditch flowing to Kapaia Reservoir. The quality of the flushing water would generally be potable and is expected to be of a better quality than the receiving surface water. Improvements at the discharge location would be made to minimize erosion.

b. Ground Water and Existing Wells

The development of Pukaki Well and Hanamaulu Well Nos. 3 and 4 is anticipated to have little effect on the water resources in the area. The total pumping capacity of the wells is 580 gpm (300 gpm anticipated for Hanamaulu Well No. 4) and assuming a maximum pump running time of 16 hours a day,

the average withdrawal and water use would be approximately 0.56 mgd. The estimated sustainable yield of the Hanamaulu Aquifer System is 40 mgd. The current pumping capacity of water sources tapping the Hanamaulu Aquifer System totals approximately 5 mgd or 12.5 percent of the aquifer yield. Therefore, in comparison with the 40 mgd yield, the 0.56 mgd pumped by the proposed projects would increase the withdrawal from the aquifer by an additional 1.4 percent or a total withdrawal rate of 13.9 percent.

The existing wells at Kilohana are not expected to be affected by the development of the Pukaki Well and Hanamaulu Well Nos. 3 and 4. The closest existing water well is approximately 2 miles away from the Pukaki Well site and farther from Hanamaulu Well Nos. 3 and 4 sites.

c. Water Quality

Pukaki Well and Hanamaulu Well No. 3 meet the DOH chemical drinking water standards. Hanamaulu Well No. 4 water quality is anticipated to be similar to Hanamaulu Well No. 3, and will be confirmed during the pump testing.

Confirmation that the wells meet the DOH biological drinking water standards also will be done after the pumps are installed. Additional sampling and biological testing will be performed, and will be monitored by the DOH.

3. Flora and Fauna

The project areas have been previously cleared for sugarcane cultivation and ranching. There are no indications of rare or endangered flora or fauna in the project area.

4. Air Quality

No long term negative impacts on air quality resulting from the proposed projects are anticipated.

5. Visual Impacts

The visual impacts of the proposed projects, specifically the proposed control tank, are not expected to be significant. The proposed control tank location is on private lands presently owned by Lihue Plantation Company, and is surrounded by cane fields. The closest public road (Maalo Road) is over one mile away, and the tank height perceived by the public will be less than one-tenth on an inch. In addition, the control tank will be painted an earthtoned color to match the surrounding environment as approved by Lihue Plantation Company.

Overhead power lines will be extended from the present termination near the control valve station site, along Maalo Road and the cane haul road to the Control Tank site. Visual impacts will be similar to the existing lines along the lower portion of Maalo Road.

6. Noise

Motor noise from the line shaft pump is not expected to be a problem due to the project site isolation. However, sound attenuation devices will be installed in the future, if necessary.

7. Archaeological/Historical Sites

No long term negative impacts on historical and archaeological sites are anticipated. The well, control tank, and control valve station sites are located in the middle of cultivated cane fields, and lands are highly disturbed. State Historic Preservation Division records indicate that there are no known archeological sites at the proposed sites. If construction work uncovers any archaeological remains, work will cease and an archaeological survey will be conducted.

8. Public Health and Safety

Public health and safety is of the utmost importance, and measures will be taken to ensure protection. All of the facilities will be surrounded by a fence. The water from the wells will be disinfected by chlorination; and the chlorination facilities will be designed, installed, and maintained in accordance with all applicable safety codes. State DOH regulations will be followed; therefore, no public health or safety problems associated with the water system improvements are anticipated.

VIII. ALTERNATIVES TO THE PROPOSED PROJECTS

A. NO ACTION ALTERNATIVE

Growth and expansion of the Lihue service area have generated potable water demands that have surpassed the capacities of the existing well sources. Additionally, existing pumpage has been reduced by more than 20 percent because of the large demands and dropping well water levels. Abandoning the projects will result in limiting further growth and housing developments in the Lihue area until alternate water sources are identified and developed. This is contrary to the County's long-range regional development plan; therefore, the No Action Alternative is unacceptable.

B. ALTERNATIVE SITES

The siting of exploratory wells is based on hydrologic, hydrogeologic, land ownership and availability, and engineering studies for the particular location. The County of Kauai considered several alternate sites and will be drilling additional exploratory wells at several nearby sites.

C. ALTERNATIVE WATER SOURCES

Alternative water sources such as desalination and use of surface water were considered, but rejected because of higher construction, operation, maintenance and administration costs. Wastewater reuse and nonpotable water supplies, rainfall catchment, and water conservation are discussed below.

1. Wastewater Reuse and Nonpotable Water Supplies

Wastewater reuse and nonpotable water supplies are potentially viable alternative water sources. Treated wastewater effluent is available from the Lihue Wastewater Treatment Plant serving the Lihue Town area. The amount of treated effluent currently available is about 1.3 mgd, and is committed to Kauai Lagoons Resort Company for reuse on their golf courses. Wastewater reuse is being accomplished, and will continue to be encouraged and pursued as a means for conserving potable water supply resources.

2. Rainfall Catchment

Rainfall catchment involves the construction of a series of ditches and reservoirs to intercept rainfall runoff from large areas of land, and is an ideal water source for agricultural use. According to the *Kauai Water Use and Development Plan*, January 1990, over 80 percent of water used on Kauai is by sugarcane plantations which rely on rainfall catchment (surface waters) as the primary water source. The Lihue Plantation Company, utilizes rainfall catchment as its primary water source to meet the sugarcane irrigation requirements; therefore, "infrastructure" is available. However, if any surface water source is used to supply municipal drinking water systems, it is subject to the DOH Surface Water Treatment Rule, which requires costly and cumbersome treatment, monitoring and reporting. Consequently, the immense cost of constructing, operating, and maintaining a water treatment facility renders this alternative infeasible and unacceptable.

3. Water Conservation

Water conservation programs can be used to better meet future water demands, and are typically implemented when a water shortage is likely. Conservation programs generally fall into two major categories: Water System Conservation and Consumer Conservation. Water system conservation is the responsibility of the water purveyor, and entails careful monitoring of all water in the transmission and distribution systems. County water uses such as for fire fighting and street and sewer flushing could be targeted for more efficient use. Additionally, detection and repair of leaks in the transmission and distribution system would be effective in reducing water "demands." DOW currently is in the process of establishing a water conservation plan.

Consumer conservation is the responsibility of the consumer, and could reduce the per capita consumption. Consumers are encouraged to use water saving utilities, to detect and repair leaks within their property, and in general, to minimize wasteful water use.

Water conservation is an environmentally beneficial practice regardless of the water supply situation. However, Kauai experiences a very wet climate and has an abundant groundwater and surface water supply. The water sources for the Lihue Water System are within the Hanamaulu Aquifer, which has a sustainable yield of 40 mgd. The average water use in 1996 was approximately 2.74 mgd, less than 7 percent of the estimated sustainable yield. Even with further development of well water sources, the water use will be a mere fraction of the aquifer yield. Although it is a practice that should be observed by all consumers, water conservation will not provide the quantity of water required to meet demands. Therefore, water conservation is deemed an insufficient alternative.

IX. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

There are several irreversible commitments of resources including land and financial resources to construct capital improvements, and to operate and maintain the wells, control tank, and various controls. Land commitment for the wells, control tank, control valve station sites is minimal, and financial commitment for capital improvements and operations and maintenance are necessary.

The long-term responsibility of the Department of Water to provide adequate water supplies to the Hanamaulu and Lihue communities supports the implementation of the proposed projects; therefore, the commitment of land, labor, materials, energy, equipment and financial resources that are practically irreversible and irretrievable are warranted.

X. PERMITS AND APPROVALS REQUIRED

A. APPROVALS

1. Lihue Plantation Company, Ltd.

2. State Department of Health
   Engineering report conforming to Section 11-20-29 after testing and before using well water.

3. State Office of Environmental Quality Control
   Environmental Assessment for Well Development and Control Tank and Control Valve Station Construction

4. County of Kauai Housing Agency
   Environmental Assessment for Well Development and Control Tank and Control Valve Station Construction

5. County of Kauai Department of Water
   Environmental Assessment for Well Development and Control Tank and Control Valve Station Construction

6. State Commission on Persons with Disabilities
   Plans and Specifications conformance with American Disabilities Act

B. PERMITS

1. Use Permit, County of Kauai, Planning Department

2. Pump Installation Permit, State Commission on Water Resource Management

3. National Pollutant Discharge Elimination System Permit, State of Hawaii, Department of Health

XI. AGENCIES AND ORGANIZATIONS CONSULTED

A. FEDERAL GOVERNMENT

U.S. Department of Agriculture, Soils Conservation Service
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, Geological Survey

B. STATE GOVERNMENT
Department of Agriculture
Department of Land and Natural Resources
Commission on Water Resource Management
State Historic Preservation Division
Department of Hawaiian Home Lands
Department of Health
Clean Water Branch
Safe Drinking Water Branch
Office of Environmental Quality Control
Office of Hawaiian Affairs

C. COUNTY GOVERNMENT
Planning Department
Department of Water
Housing Agency

XII. FINDINGS AND DETERMINATION

A. FINDINGS

Based upon the guidelines and provisions of Title 11, Chapter 200, Environmental Impact Statement Rules and Chapter 343, HRS, the findings of this environmental assessment are:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;

   The proposed projects will not cause any loss or destruction of a natural or cultural resource. As described in this assessment, the proposed project sites have been researched extensively with no findings of significant impacts. Any discovery of archaeologically significant resources uncovered during the construction will be handled in compliance with the requirements of the State of Hawaii, Department of Land and Natural Resources.

2. Curtail the range of beneficial uses of the environment;

   The projects are enhancing the beneficial use of the environment, as they are drawing upon the naturally occurring groundwater supply in the area to serve a growing demand for drinking water by the community. The project sites are limited to the wells, control tank. and control valve station sites. The required land area is a small fraction of the total area that is available for agriculture in the vicinity, and the projects provide valuable groundwater for the Lihue Water System.

3. Conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes, and revisions thereof and amendments thereto, court decisions or executive orders;

   The proposed projects are in accordance with the guidelines set forth in the State Environmental Policy Chapter 344, Hawaii Revised Statutes.

4. Substantially affects the economic or social welfare of the community or State;

   The proposed projects will serve to increase the amount of potable water available for the Lihue Water System, which cannot meet the current maximum daily demand. They will enhance the welfare of the community by increasing the potable water source capacity to users.

5. Substantially affect public health;

   The proposed projects will not affect public health in a negative way.

6. Involves a substantial secondary impact, such as population changes or effects on public facilities;

   The proposed projects will connect to the existing water distribution system to serve the current maximum daily demand for the existing population. It will not involve any substantial secondary impacts.

7. Involves a substantial degradation of environmental quality;

   The proposed projects will not involve any substantial degradation of environmental quality. As described in this assessment, the impacts on the environment are minimal.

8. Is individually limited but cumulatively has considerable effect upon the environment or involve a commitment for larger actions;

   As described in this assessment, the proposed projects do not have any significant impacts or effects upon the environment or involve any commitment for larger actions.

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

   There are no known endangered species of flora or fauna in the vicinity of the project sites that would be disturbed.

10. Detrimentally affect air or water quality or ambient noise levels;

    The proposed projects provide potable groundwater for human use and consumption. They will not detrimentally affect air or water quality, or ambient noise levels.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;

    As discussed in detail in this assessment, the proposed projects do not detrimentally affect any environmentally sensitive areas.

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

    The proposed projects do not affect any scenic vistas or view planes identified in county or state plans or studies.

13. Requires substantial energy consumption.

    As described in this assessment, the proposed projects will require energy to pump water from Pukaki Well and Hanamaulu Well Nos. 3 and 4 to the new control tank. The amount of energy to construct, operate, and maintain the proposed projects would be a small fraction of the total amount of energy currently being used in the area. The proposed projects will not require substantial energy consumption.

B. DETERMINATION

Based upon the above data and analyses, the proposed projects are not anticipated to have significant adverse impacts on the coastal waters, local ecology, hydrology, and atmosphere. Mitigative measures will be implemented as deemed necessary and as required by the governmental agencies. A Finding of No Significant Impact determination (Environmental Impact Statement document is not required) has been issued.

XIII. REFERENCES

1. AMFAC/JMB Hawaii, Inc., Lihue-Hanamaulu Master Planned Community, Preliminary Engineering Report for Water Requirements, September 16, 1994. Prepared by Kodani and Associates, Inc.

2. AMFAC/JMB Hawaii, Molokoa Hydrologic Study, Lihue, Kauai, January 1995. Prepared by Water Resources Associates.

3. County of Kauai, Department of Water, Final Environmental Assessment, Lihue and Hanamaulu Water Development Projects, Phase I – Pukaki Well and Hanamaulu Well No. 3, August 1998. Prepared by Fukunaga and Associates, Inc.

4. County of Kauai, Department of Water, Technical Reference Document for the Kauai Water Use and Development Plan, January 1990. Prepared by R.M. Towill Corporation.

5. County of Kauai, Housing Agency, Final Environmental Assessment for Lihue & Hanamaulu Water Development Projects Phase II – Installation of Connecting Pipelines, August 1998. Prepared by Par En Inc., dba Park Engineering.

6. Results of Drilling and Testing DOW-Pukaki Well (0023-02), Lihue Basin, Kauai, November 1998. Prepared by Water Resource Associates.

7. State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources, Kauai Water Use and Development Plan, February 1992. Prepared by R.M. Towill Corporation.

8. State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources, State Water Resources Protection Plan, Vol. I & II, June 1990. Prepared by George A.L. Yuen & Associates, Inc.

9. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey, Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, August 1972.

10. U.S. Geological Survey, Ground Water in the Southern Lihue Basin, Kauai, Hawaii, Water-Resources Investigations Report 98-4031, 1998.

11. University of Hawaii, Department of Geography, Atlas of Hawaii, Second Edition, University of Hawaii Press, 1983.

APPENDIX A:

PUMP TEST DATA

PUMP TEST DATA

Pukaki Well

Pukaki Well

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

WELL COMPLETION REPORT

4/25/97 WCR Form

(Check Appropriate Box) ☐ Well Construction ☐ (Permanent) Pump Installation

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, or 1-800-468-4644 Extension 70225.

1. State Well No.: 0023-02 Well Name: Pukaki Island: Kauai
2. Location/Address: Lihue Basin Tax Map Key: 3-8-2:2

PART I. WELL CONSTRUCTION REPORT

3. Drilling Company: Rainbow Drilling Specialists, Inc.
4. Name of driller who performed work: R. Lee Mueller
5. Type of rig/construction: Rotary Air Foam Down Hole Hammer
6. Date(s) Well Construction and pump tests (if any) completed: 7/30/95
7. GROUND ELEVATION (referenced to mean sea level, msl): _____ ft.
   Well Bench Mark (description/location): _____ Elevation(msl): _____ ft.
8. DRILLER'S LOG: *Please attach geologic log (if available or if required by permit)*

Depths (ft.)	Rock Description, Water Level, Dates, etc.	Depths (ft.)	Rock Description, Water Level, Dates, etc.
Surf to 8'	Red Dirt	28' to 64'	Brown Weathered Basalt
8' to 28'	Red to Brown Mud	64' to 130'	Red Mud

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

9. Total depth of well below ground: 810' ft.
10. Hole size: 26 inch dia. from Surface ft. to 43 ft. below ground
    22 inch dia. from 43 ft. to 810 ft. below ground
    _____ inch dia. from _____ ft. to _____ ft. below ground
11. Casing installed: 12 in. I.D. x 3/8 in. wall solid section to 395 ft. below ground
    _____ in. I.D. x _____ in. wall perforated section to _____ ft. below ground
    Casing Material/Slot Size: _____
12. Annulus: Grouted from Surface ft. below ground to 165 ft. below ground
    Gravel packed from _____ ft. below ground to _____ ft. below ground
13. Initial water level: 91.83 ft. below ground. Date and time of measurement: 7/1/95 1200
14. Initial chloride: _____ ppm Date and time of sampling: _____
15. Initial temperature: _____ °F Date and time of measurement: _____
16. PUMPING TESTS: Reference Point (R.P.) used: Ground Level, which elevation is _____ ft.
    (1) Step-Drawdown Test Date 7/18/95
    Start water level 111.50 ft. below R.P.
    End water level 372.88 ft. below R.P.
    (2) Long-term Aquifer Test Date 7/30/95
    Start water level 320.17 ft. below R.P.
    End water level 321.17 ft. below R.P.
17. Aquifer Pump Test Procedures data & graphs *(1/9/96 LTAT Form)* attached? __ Yes __ No
18. As-built drawings attached attached? __ Yes __ No
19. Other remarks/comments: *(On back of this form)*

Well Drilling Contractor (print) Rainbow Drilling Specialists, Inc. C-57 Lic. No. 17137
Signature [signature] Date 11/29/95

Surveyor (print) Ronald Casuga Lic. No. 4332
Signature See attached Date February 26, 1999

Applicant (print) County of Kauai, Dept of Water
Signature [signature] Date 3/12/99

WELL CONSTRUCTION PERMIT

Pukaki Well, Well No. 0023-02

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of Pukaki Well (Well No. 0023-02) at Lihue Basin, Kauai, TMK 3-8-2:2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences.

2. The well construction permit shall be for construction and testing of the well only. A minimum one-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

4. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and contact the Department's Historic Preservation Division (587-0045) immediately.

6. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   a. Well completion report, (attached - Part I, Well Construction Report).
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

8. The permittee shall comply with all applicable laws, rules, and ordinances, and non-compliance may be grounds for revocation of this permit.

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97).

10. The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

12. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: July 21, 1997
Expiration Date: July 21, 1997

MICHAEL D. WILSON, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day.

Permittee's Signature: E. Y. W. Lau Date: _____

Printed Name: Ernest Y. W. Lau Firm or Title: Manager & Chief Engineer

Driller's Signature: C. Lee Mueller License #: C19137 Date: 4/6/98

Printed Name: C. LEE MUELLER Firm or Title: RAINBOW DRILLING SPECIALISTS, INC

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Robert Vorfeld, Lihue Plantation Co.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON
CHAIRPERSON

ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIIKE
RICHARD H. COX
HERBERT M. RICHARDS, JR.

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

97 JUL 24 P2:06

COUNTY OF KAUAI

REF:CWRM-SS

JUL 23 1997

Mr. Ernest Lau
Kauai Department of Water
P.O. Box 1706
Lihue, Hawaii 96766-5706

Dear Mr. Lau:

Well Construction Permit
Pukaki (Well No. 0023-02)

Enclosed are two (2) copies of your approved *Well Construction Permit* for the captioned well(s) which authorizes well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 12:

Special Conditions

1. The well shall be cased with new steel casing conforming to one of the manufacturing standards listed in Hawaii Well Construction and Pump Installation Standards (January, 1997) and in the standards of AWWA publication ANSI/AWWA A100-90, as may be amended. The physical properties of the steel shall conform to ASTM A-242, ASTM A53, Type E or S, Grade B, or approved equal. The well casing shall be manufactured in accordance with applicable sections of ASTM A139, as may be amended.

This permit does not authorize work for your permanent pump installation. Approval and issuance of your pump installation permit is contingent upon completed application and information provided to and accepted by Commission staff as required in the Well Construction & Pump Installation Standards (1/23/97) and any special conditions performed under this permit. Please note that special conditions may simply highlight application deviations from the Standards.

The well owner is responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions.

To validate your permit, please sign and have the contractor sign both permit originals and return one for our files. Also, copies of the aquifer pump test worksheet and the well completion report form are enclosed for your use. Please provide all the information in this packet to your well drilling contractor.

Also attached for your information is a copy of the Department of Health's review comments.

If you have any questions, please call the Commission staff at 587-0218 or toll-free at 274-3141, extension 70218.

Aloha,

for MICHAEL D. WILSON
Chairperson

Enclosures

LONG-TERM AQUIFER TEST DATA

Pumped Well No. _____
Pumped Well Name _____
Target Q _____ gpm

Observation well no. _____
Distance between Obs.& Pumped Well _____ ft.
Reference pt. for depth to water _____ ft. msl
Static Water Level @ start of test _____ ft. msl

Water level measurements by: ☐ steel tape ☐ pressure transducer ☐ airline

START TEST Date: _____ Hour of day: _____

Flow Meter Reading Start: _____ gals

Suggested elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.01 ft)	Drawdown (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl (mg/l)	Temp. ___ °F or ___ °C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
0	0	116.75	0.00				.	Start test
1	1.05	214.77	98.02	[illegible]			.	
1.5	1.55	215.13	98.38	156			.	
2							.	
2.5	2.55	215.44	98.69				.	
3	3.55	216.20	99.45				.	
4	4.20	216.47	99.72				.	
5	4.50	217.09	100.34				.	
6	6.05	218.29	101.54				.	
7	7.10	219.17	102.42				.	
8	8.10	220.09	103.33	152.4			.	
10	10.40	221.44	104.69				.	
15	15.40	224.14	107.39	150.9			.	
20	20.10	226.34	109.59				.	
25	25.10	228.88	112.13				.	
30	30.20	232.16	115.41	155			.	
40	39.50	236.88	120.13				.	
50	50.20	241.84	125.09				.	
60	59.50	242.48	125.73				.	
70	69.50	243.51	126.76				.	
80	80.20	244.27	127.52	147.4			.	
90	90	245.13	128.38	146.3			.	
100	100	245.63	128.88				.	
150	150	245.13	128.38				.	
200	200	245.42	128.67				.	
250	250	246.21	129.46				.	

Time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.01 ft)	Drawdown s (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl⁻ (mg/l)	Temp. ___° F or ___° C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
300	300	248.00	131.25	145.2			.	
400	390	251.33	134.58	142.9			.	
500	480	257.71	140.96	142.5			.	
600	600	271.54	154.79	146.2			.	
700	720	278.92	162.08	145.4			.	
800	840	278.92	162.17	145.4			.	
900	900	278.00	161.25	143.2			.	
1000	1020	282.42	165.67	144.7			.	
1500	1500	298.60	181.85	141.9			.	
2000	1980	318.46	201.71	145.2			.	
2500	2520	360.08	243.33	144.9			.	
3000	3000	366.00	249.25	135.3			.	REDUCE FLOW
4000	4020	349.67	232.92	135.6			.	RATE TO 130 GPM
5000	5020	330.10	213.35	130.2			.	
6000	6000	351.83	235.33	134.3			.	
7000	7020	329.79	213.02	129.5			.	
8000	8020	329.44	212.69	131.2			.	
9000	9000	326.23	209.48	130.2			.	
10000	10020	326.92	210.17	130.8				Max possible duration, water level or quality did not stabilize for any 24 period
1440	14400	321.17	204.42	129.4				
			Use same ending drawdown figure as start for recovery	0				Begin recovery data next page Flow meter reading at end of pumped period: _____ gals

FOR MONITOR WELL DETAIL SEE ATTACHED REPORTS

Elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.01 ft)	Recovery s' (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl⁻ (mg/l)	Temp. ___ °F or ___ °C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
0	0	321.17		0			.	Start recovery
1		280	163.25	0			.	
1.5		266	149.25	0			.	
2		264	147.25	0			.	
2.5		262	145.25	0			.	
3		259	142.25	0			.	
4		254	137.25	0			.	
5		250	133.25	0			.	
6		245	128.25	0			.	
7		240	123.25	0			.	
8		236	119.25	0			.	
10		227	110.25	0			.	
15		208	91.25	0			.	
20		193	76.25	0			.	
25		181	64.25	0			.	
30		175	58.25	0			.	
40		165	48.25	0			.	
50		158	41.25	0			.	
60		154	37.25	0			.	
70		151	34.25	0			.	
80		149	32.25	0			.	
90		148	31.25	0			.	
100		147.1	30.35	0			.	
150		149.2	27.45	0			.	
200		142.29	25.54	0			.	
250		140.80	24.05	0			.	☐ 80% recovery achieved ☐ 80% recovery not achieved

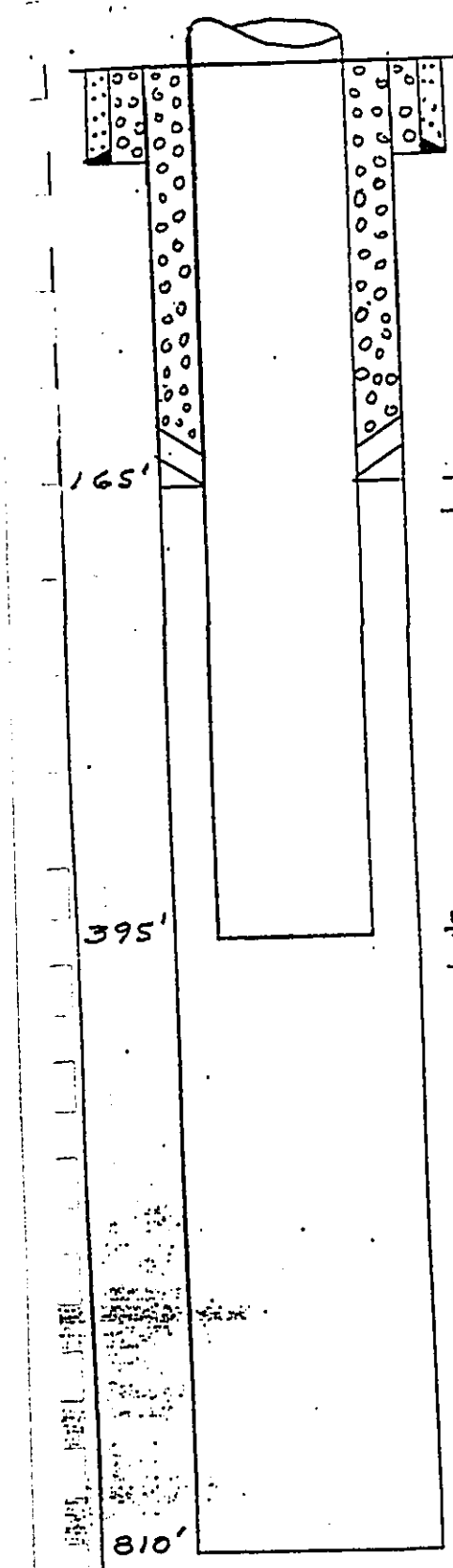
END TEST Date: 7/31/98 Hour of day: 1500

ADDITIONAL REMARKS:

Person in charge of pump test (print): C. LEE MUELLER

Signature: [signature]

The signature above indicates that the data reported on this form is accurate and true to the best of the person's knowledge who operated this aquifer test.



SURFACE ELEVATION MSL

26" HOLE DRILLED TO 43' 24" ID CONDUCTOR SET & GROUTED WITH 40 SACKS NEAT CEMENT

22" x 12" ANNULUS GROUTED WITH 12 YDS TREMIE MIX CEMENT BASKETS @ 160' & 165' STEEL RING @ 165'

CASING DEPTH 395' SIZE 12" WALL 3/8" TYPE ASTM 242

HOLE SIZE 22"
TOTAL DEPTH 810'

OWNER COUNTY OF KAUAI

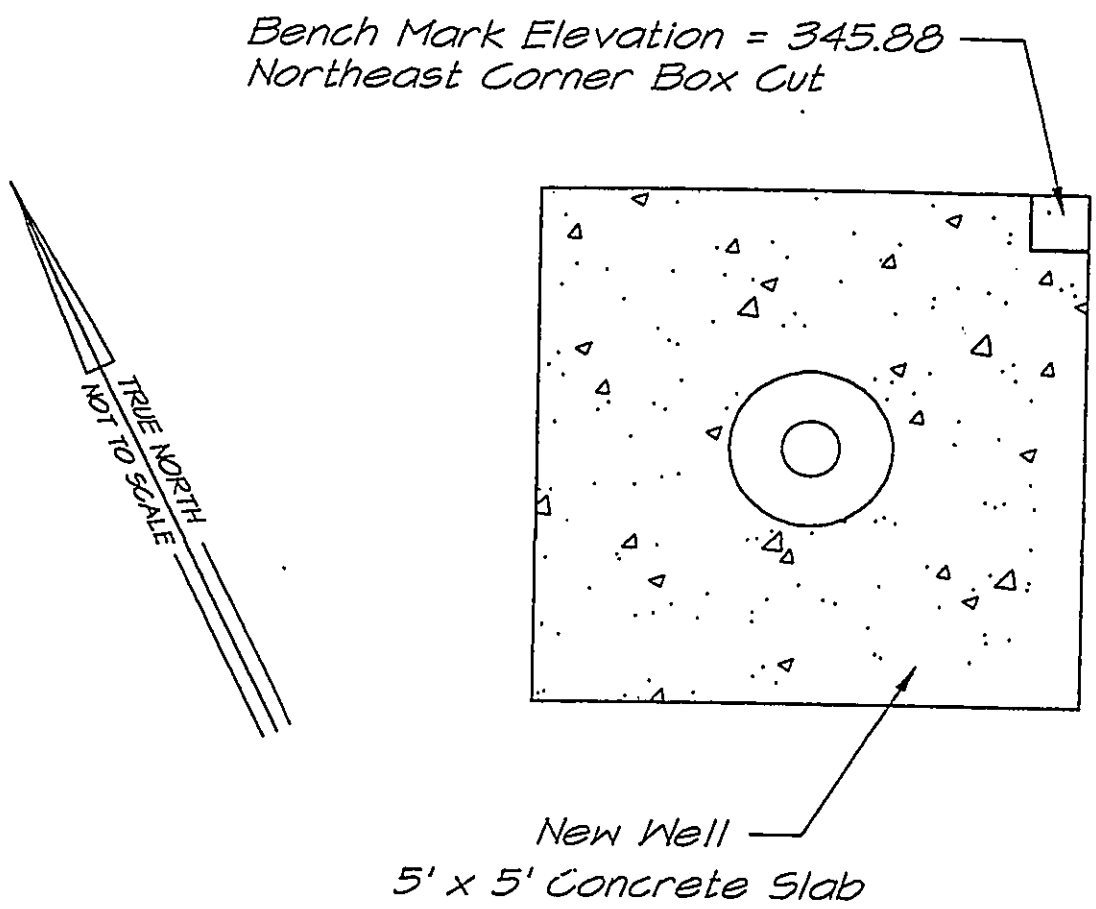
WELL PUKAKI

PERMIT # 0023-02 TMK 3-8-2:2

CONTRACTOR RAINBOW DRILLING SPECIALISTS, INC

LICENSE # 19137 DATE 11/29/93

SIGNED RME



RONALD CASUGA
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4332
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION

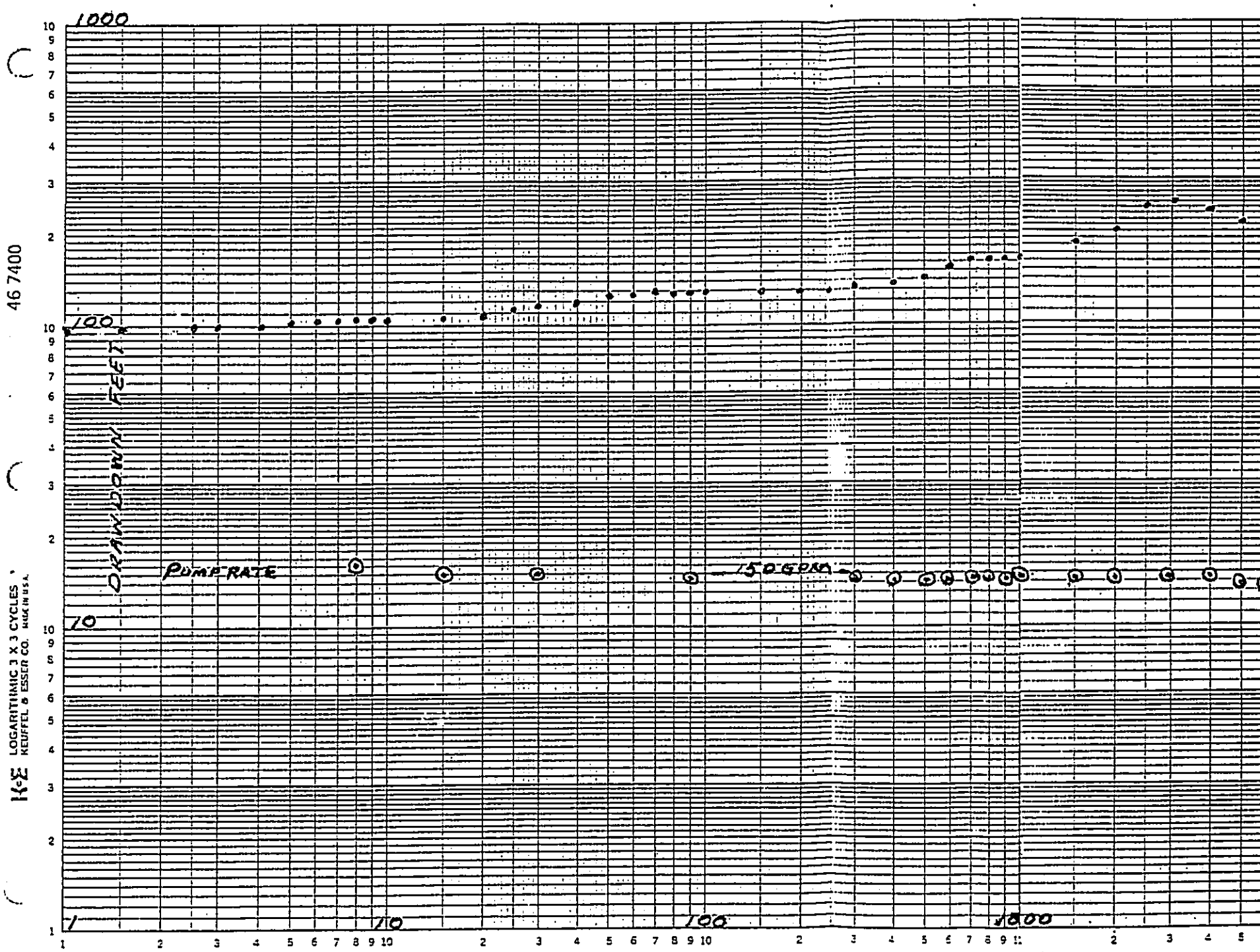
Ronald Casuga
Licensed Professional Land Surveyor
Certificate No. 4332

NEW PUKAKI WELL

February 26, 1999

KODANI AND ASSOCIATES, INC.

8.5" X 11"=1.0 Sq. Ft.

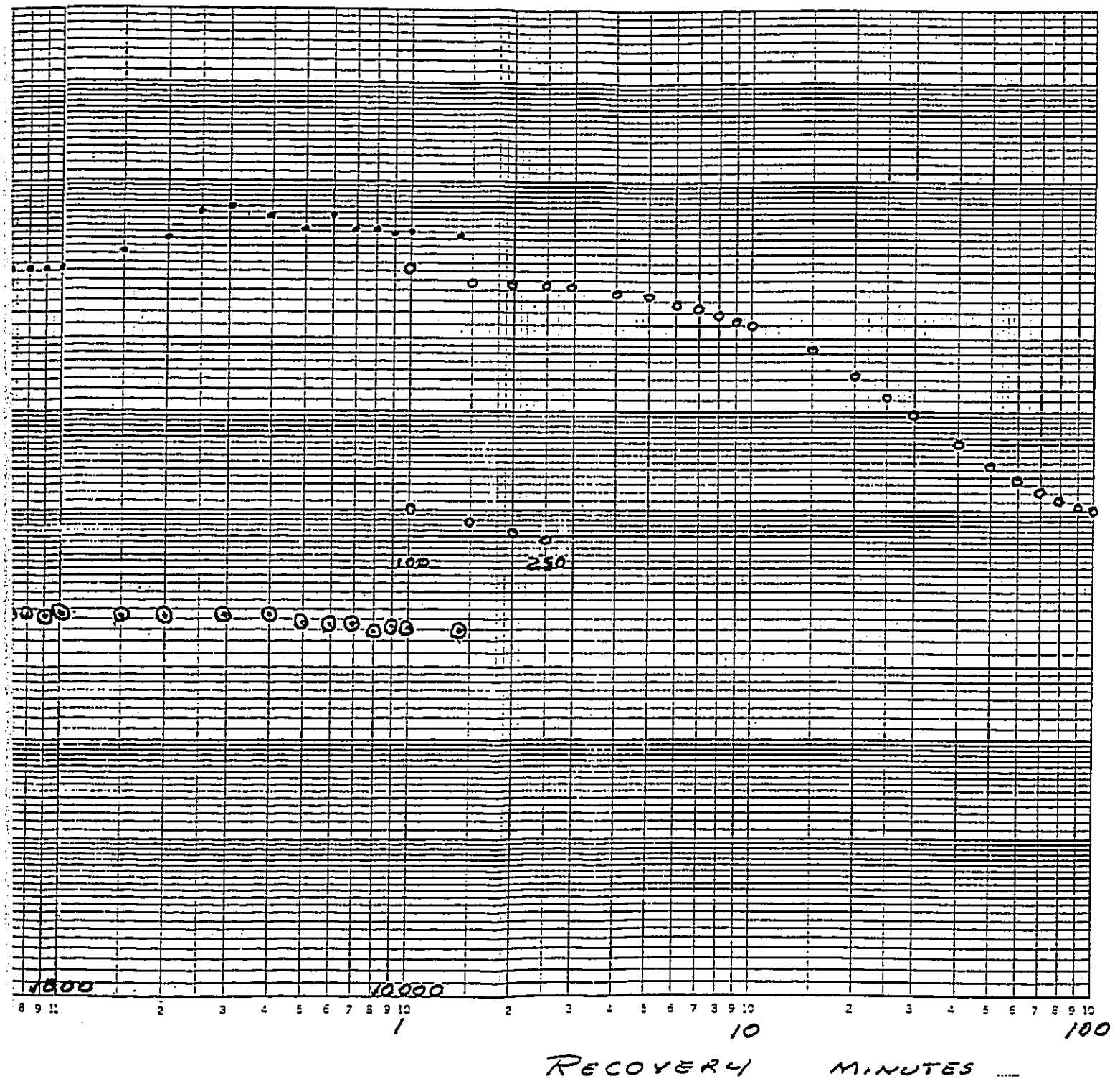

1000
100
10
1
DRAWDOWN IN FEET
PUMP RATE
150 GPM
TIME MINUTES
46 7400
K&E LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

COUNTY OF KAUAI

PUHAKI WELL

PERMIT # 0023-02 TMK 3-8-2:2

LONG TERM TEST 7/30/98 RATE 130GPM



RECOVERY MINUTES

PUKAKI WELL - STEP TEST
Date Conducted: July 11, 1998

Time	Flow (gpm)	Depth to Water (feet)	Drawdown (feet)	Time	Flow (gpm)	Depth to Water (feet)	Drawdown (feet)
7:30		111.50		10:16:20	100	172.86	61.36
7:50		111.08	-.42	10:17:40			
7:57:50	100	137.79	26.29	10:25			
7:59:20	100	137.79	26.29	10:23:10	120	172.63	61.13
8:00	100	137.42	25.92	10:24	120		
8:00:30	100	125.83	14.33	10:27:35	120	176.78	65.28
8:01:20	100	120.38	8.88	10:28:20	120	177.94	66.44
8:02:40	100			10:29	120	178.64	67.14
8:04	100	145.71	34.21	10:31:20	120	180.44	68.94
8:06:04	100	155.08	43.58	10:32:20	120	181.06	69.56
8:07:10	100	156.48	44.98	10:34:30	120	181.75	70.25
8:08	100	158.04	46.54	10:39	120		
8:09:30	100	160.88	49.38	10:40:30	120	183.35	71.85
8:10:30	100	162.98	51.48	10:42:40	120	184.28	72.78
8:12:25	100	165.13	53.63	10:46:35	120	184.78	73.28
8:13:40	100	166.21	54.71	10:54:40	120	188.78	77.28
8:15:20	100	168.17	56.67	10:58:30	120	189.58	78.08
8:18:55	100	167.83	56.33	10:59	120	189.64	78.14
8:20	100	167.27	55.77	10:59:20	120	189.75	78.25
8:21:30	100	167.35	55.85	11:01:20	120	190.05	78.55
8:22:25	100	167.33	55.83	11:10	120	191.92	80.42
8:23:40	100	167.33	55.83	11:12:50	120	190.88	79.38
8:29	100	167.67	56.17	11:15:20	120	191.17	79.67
8:34:50	100	167.96	56.46	11:27:40	120	189.25	77.75
8:39:50	100	168.96	57.46	11:31	120		
8:44	100	169.69	58.19	11:32:10	120	189.63	78.13
8:47:30	100			11:35:30	120	189.96	78.46
8:49:20	100	169.79	58.29	11:41	120	189.67	78.17
8:55:30	100	170.83	59.33	11:46:20	120	189.19	77.69
9:03:50	100	173.10	61.60	11:48:50	120	188.92	77.42
9:11:50	100	173.15	61.65	11:50:20			
9:16:20	100	172.65	61.15	11:53			
9:17:15	100	172.48	60.98	11:55			
9:22	100	172.38	60.88	11:56:40	150	200.19	88.69
9:27:45	100	172.29	60.79	12:03	150	204.71	93.21
9:32:20	100	172.38	60.88	12:03:30	150	204.96	93.46
9:37:35	100	172.42	60.92	12:07:25	150	207.40	95.90
9:44	100	172.31	60.81	12:10	150	208.96	97.46
9:51:30	100	172.40	60.90	12:16:20	150	211.33	99.83
9:54:30	100	172.38	60.88	12:20:10	150	212.25	100.75
10:00	100	172.83	61.33	12:29:20	150	215.19	103.69
10:03:30	100	173.04	61.54	12:30:30	150	215.60	104.10
10:06:30	100	173.15	61.65	12:32:20	150	215.71	104.21
10:09	100	173.11	61.61	12:35	150	216.13	104.63
10:13:10	100	173	61.50	12:40	150	216.71	105.21

Time	Flow (gpm)	Depth to Water (feet)	Drawdown (feet)
12:42:40			
12:43:20	150	217	105.50
12:48:30	150	217.27	105.77
12:53	150	217.23	105.73
12:57:30	150	217.22	105.72
13:03:30	150	217.33	105.83
13:05:45			
13:12:30	150	216.69	105.19
13:15:20	150	216.58	105.08
13:18:20	150	216.53	105.03
13:19			
13:24:30	200	230.48	118.98
13:30	200	236.44	124.94
13:39	200	248.96	137.46
13:40			
13:49:10	200	259.88	148.38
13:55:20	200	265.10	153.60
14:01	200	269.44	157.94
14:01:30	200	270.10	158.60
14:01:50	200	270.67	159.17
14:02:10	200	271.13	159.63
14:02:40	200	271.67	160.17
14:08	200	276.92	165.42
14:08:30	200	277.27	165.77
14:14:40	200	282.88	171.38
14:15:10	200	283.71	172.21
14:15:50	200	284.60	173.10
14:17:40	200	284.58	173.08
14:20	200	288.65	177.15
14:23:15	200	290.67	179.17
14:30	200	293.59	182.09
14:35:30	200	299.83	188.33
14:38:10	200	302.64	191.14
14:40:30	200	304.49	192.99
14:44:50	200	307.92	196.42
14:49:40	200	308.94	197.44
14:56:10	200	313.20	201.70
15:00:10	200	317.47	205.97
15:03:50	200	320.90	209.40
15:07:40	200	323.71	212.21
15:12:50	200	325.97	214.47
15:16:35	200	327.57	216.07
15:25:40	200	335.30	223.80
15:29:10	200	337.70	226.20
15:33	200	339.29	227.79
15:38:25	200	340.49	228.99
15:44:20	200	341.39	229.89
15:49:10	200	341.90	230.40
15:55	200	349.10	237.60
16:00	200	352.52	241.02

Time	Flow (gpm)	Depth to Water (feet)	Drawdown (feet)
16:05:40	200	354.73	243.23
16:10	200	356.33	244.83
16:15:10	200	357.92	246.42
16:19:50	200	358.92	247.42
16:26:20	200	359.92	248.42
16:27:20			
16:30:50	200	360.69	249.19
16:35:10	200	361.35	249.85
16:40:10	200	361.92	250.42
16:45:20	200	363.22	251.72
16:49:20	200	364.15	252.65
16:53:20	200	368.71	257.21
16:54:20	200	369.42	257.92
16:55:10	200	369.88	258.38
16:56:30	200	370.71	259.21
16:58:20	200	371.65	260.35
17:00:10	200	372.88	261.38

Shut down at 17:00:20.

Recovery

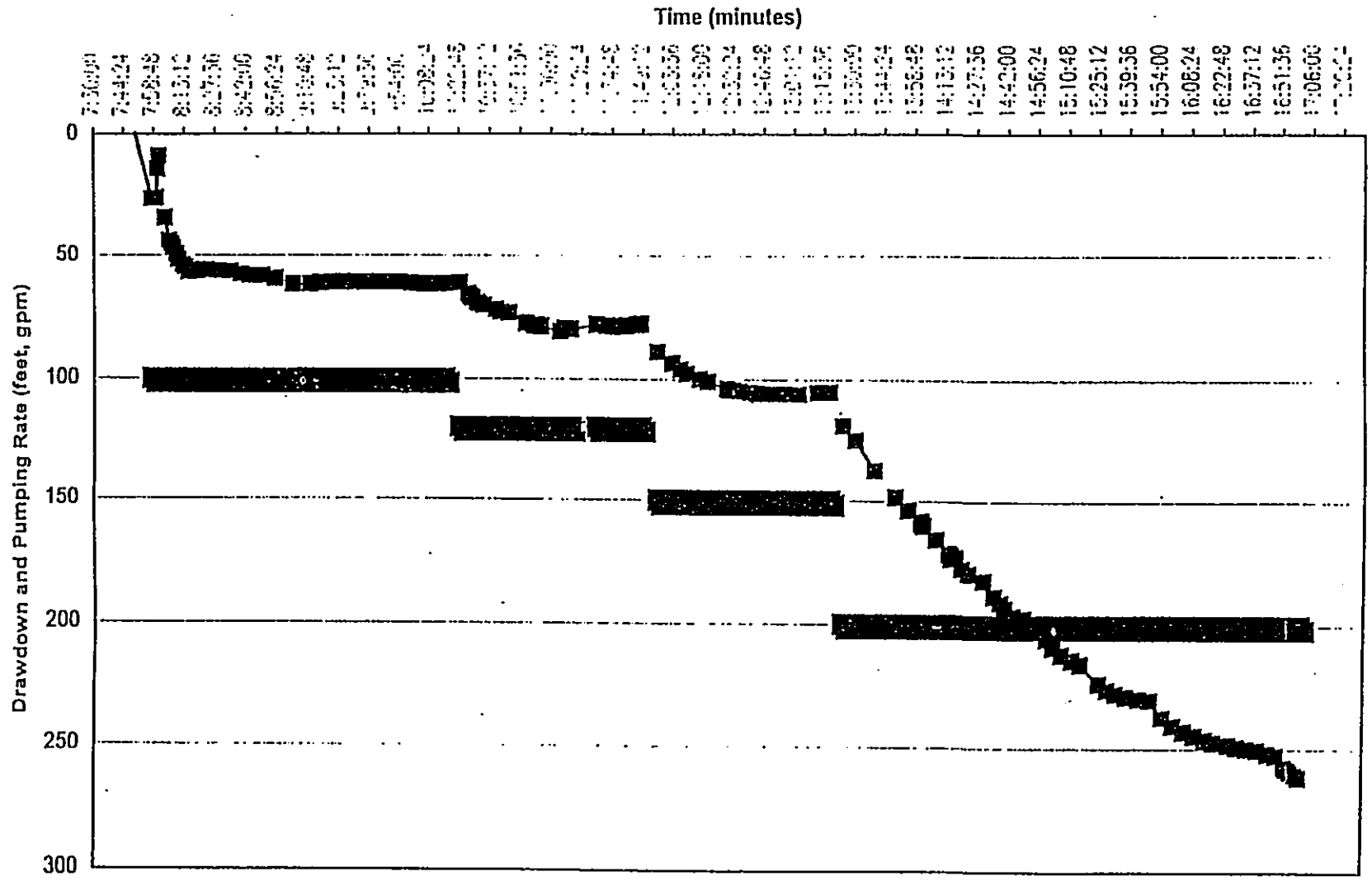
Time	Depth to Water (feet)	Drawdown (feet)
17:02:16	320.71	209.21
17:02:27	315.71	204.21
17:02:40	313.71	202.21
17:02:56	311.71	200.21
17:03:03	310.71	199.21
17:03:09	309.71	198.21
17:03:20	308.71	197.21
17:03:28	307.71	196.21
17:03:36	306.71	195.21
17:03:45	305.71	194.21
17:03:51	304.71	193.21
17:04:00	303.71	192.2
17:04:07	302.71	191.21
17:04:15	301.71	190.21
17:04:21	300.71	189.2
17:04:29	299.71	188.2
17:04:39	298.71	187.21
17:04:45	297.71	186.21
17:04:53	296.71	185.2
17:05:00	295.71	184.21
17:05:07	294.71	183.21
17:05:17	293.71	182.21
17:05:25	292.71	181.21

Time	Depth to Water (feet)	Drawdown (feet)	Time	Depth to Water (feet)	Drawdown (feet)
17:05:33	291.71	180.21	17:12:00	241.71	130.21
17:05:40	290.71	179.21	17:12:08	240.71	129.21
17:05:49	289.71	178.21	17:12:15	239.71	128.21
17:05:57	288.71	177.21	17:12:23	238.71	127.21
17:06:04	287.71	176.21	17:12:32	237.71	126.21
17:06:12	286.71	175.21	17:12:42	236.71	125.21
17:06:20	285.71	174.21	17:12:54	235.71	124.21
17:06:27	284.71	173.21	17:13:02	234.71	123.21
17:06:35	283.71	172.21	17:13:13	233.71	122.21
17:06:42	282.71	171.21	17:13:23	232.71	121.21
17:06:50	281.71	170.21	17:13:31	231.71	120.21
17:06:57	280.71	169.21	17:13:41	230.71	119.21
17:07:05	279.71	168.21	17:13:53	229.71	118.21
17:07:12	278.71	167.21	17:14:03	228.71	117.21
17:07:20	277.71	166.21	17:14:13	227.71	116.21
17:07:28	276.71	165.21	17:14:21	226.71	115.21
17:07:36	275.71	164.21	17:14:30	225.71	114.21
17:07:44	274.71	163.21	17:14:39	224.71	113.21
17:07:52	273.71	162.21	17:14:47	223.71	112.21
17:07:59	272.71	161.21	17:14:54	222.71	111.21
17:08:07	271.71	160.21	17:15:04	221.71	110.21
17:08:14	270.71	159.21	17:15:11	220.71	109.21
17:08:22	269.71	158.21	17:15:20	219.71	108.21
17:08:29	268.71	157.21	17:15:28	218.71	107.21
17:08:37	267.71	156.21	17:15:36	217.71	106.21
17:08:44	266.71	155.21	17:15:44	216.71	105.21
17:08:53	265.71	154.21	17:15:52	215.71	104.21
17:09:00	264.71	153.21	17:16:00	214.71	103.21
17:09:08	263.71	152.21	17:16:09	213.71	102.21
17:09:14	262.71	151.21	17:16:17	212.71	101.21
17:09:23	261.71	150.21	17:16:25	211.71	100.21
17:09:30	260.71	149.21	17:16:33	210.71	99.21
17:09:38	259.71	148.21	17:16:43	209.71	98.21
17:09:44	258.71	147.21	17:16:50	208.71	97.21
17:09:52	257.71	146.21	17:17:00	207.71	96.21
17:10:00	256.71	145.21	17:17:08	206.71	95.21
17:10:09	255.71	144.21	17:17:17	205.71	94.21
17:10:17	254.71	143.21	17:17:25	204.71	93.21
17:10:25	253.71	142.21	17:17:34	203.71	92.21
17:10:33	252.71	141.21	17:17:42	202.71	91.21
17:10:41	251.71	140.21	17:17:50	201.71	90.21
17:10:48	250.71	139.21	17:17:59	200.71	89.21
17:10:57	249.71	138.21	17:18:08	199.71	88.21
17:11:04	248.71	137.21	17:18:16	198.71	87.21
17:11:12	247.71	136.21	17:18:26	197.71	86.21
17:11:20	246.71	135.21	17:18:34	196.71	85.21
17:11:28	245.71	134.21	17:18:44	195.71	84.21
17:11:35	244.71	133.21	17:18:53	194.71	83.21
17:11:44	243.71	132.21	17:19:02	193.71	82.21
17:11:52	242.71	131.21	17:19:12	192.71	81.21

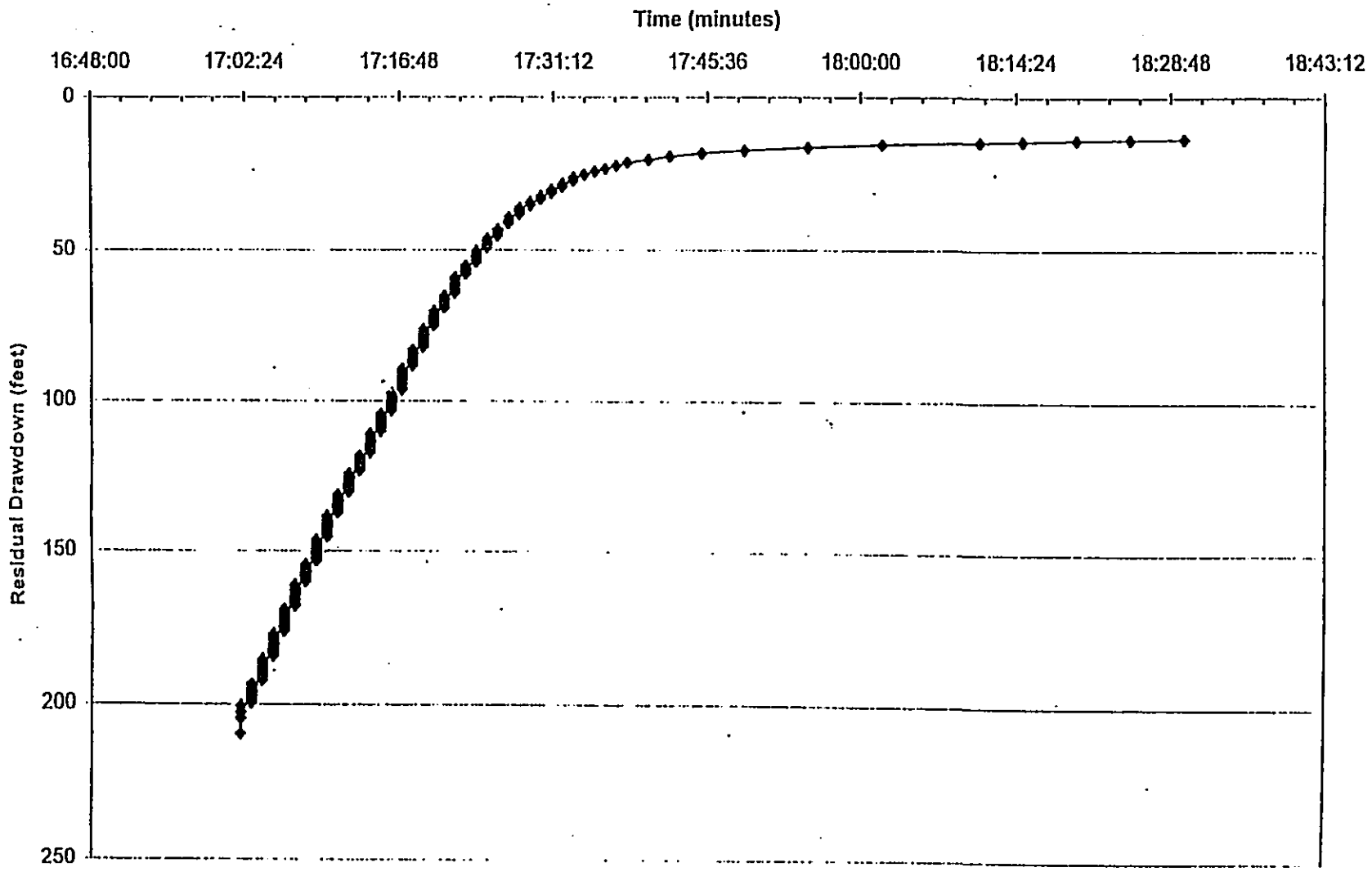
Time	Depth to Water (feet)	Drawdown (feet)
17:19:21	191.71	80.21
17:19:30	190.71	79.21
17:19:40	189.71	78.21
17:19:48	188.71	77.21
17:19:59	187.71	76.21
17:20:08	186.71	75.21
17:20:18	185.71	74.21
17:20:27	184.71	73.21
17:20:38	183.71	72.21
17:20:47	182.71	71.21
17:20:58	181.71	70.21
17:21:08	180.71	69.21
17:21:19	179.71	68.21
17:21:29	178.71	67.21
17:21:40	177.71	66.21
17:21:50	176.71	65.21
17:22:02	175.71	64.21
17:22:12	174.71	63.21
17:22:25	173.71	62.21
17:22:35	172.71	61.21
17:22:46	171.71	60.21
17:22:58	170.71	59.21
17:23:10	169.71	58.21
17:23:22	168.71	57.21
17:23:35	167.71	56.21
17:23:46	166.71	55.21
17:24:01	165.71	54.21
17:24:13	164.71	53.21
17:24:27	163.71	52.21
17:24:40	162.71	51.21
17:24:55	161.71	50.21
17:25:07	160.71	49.21
17:25:23	159.71	48.21
17:25:36	158.71	47.21
17:25:53	157.71	46.21
17:26:07	156.71	45.21
17:26:26	155.71	44.21
17:26:42	154.71	43.21
	153.71	42.21
17:27:18	152.71	41.21
17:27:37	151.71	40.21
17:27:56	150.71	39.21
17:28:16	149.71	38.21
17:28:36	148.71	37.21
17:28:58	147.71	36.21
17:29:21	146.71	35.21
17:29:46	145.71	34.21
17:30:09	144.71	33.21
17:30:38	143.71	32.21
17:31:03	142.71	31.21

Time	Depth to Water (feet)	Drawdown (feet)
17:31:35	141.71	30.21
17:32:02	140.71	29.21
17:32:41	139.71	28.21
17:33:16	138.71	27.21
17:33:58	137.71	26.21
17:34:39	136.71	25.21
17:35:34	135.71	24.21
17:36:28	134.71	23.21
17:37:41	133.71	22.21
17:38:56	132.71	21.21
17:40:43	131.71	20.21
17:42:40	130.71	19.21
17:45:35	129.71	18.21
17:49:10	128.71	17.21
17:55:05	127.71	16.21
18:02:10	126.71	15.21
18:11:40	125.93	14.43
18:15:00	125.60	14.10
18:20:00	125.15	13.65
18:25:00	124.92	13.42
18:30:00	124.69	13.19

Pukaki Step Drawdown Test

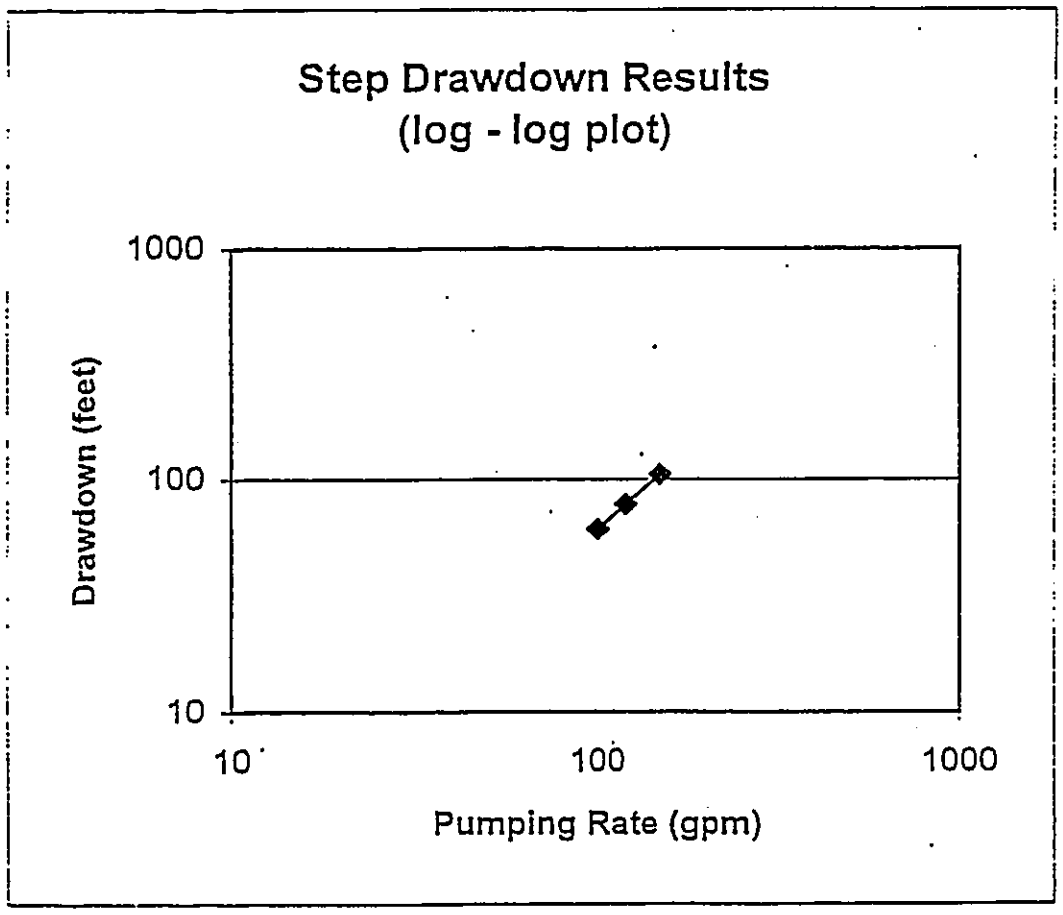


Pukaki Well Step Drawdown Recovery



Stabilized Drawdown and Pumping Rate Data

Pumping Rate (gpm)	Stabilized Drawdown (feet)
100	61
120	78
150	105



PUKAKI WELL - CONSTANT-RATE TEST
Date Started: July 20, 1998
SHUT DOWN - July 30, 1998

Approximate ground elevation: 345' (msl)

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
06:30	0	116.75			
09:00	0	116.75	228.25		
09:00:30	REMARKS: Started Pumping. 3" meter broken, using 6" meter				
09:01:35		214.77	130.23	98.02	
09:02:05		215.13	129.88	98.38	
09:02:35		215.44	129.56	98.69	
09:03:35		216.20	128.80	99.45	
09:04:20		216.47	128.53	99.72	
09:04:50		217.09	127.91	100.34	
09:05	156.0				
09:05:35		217.77	127.23	101.02	
09:06:05		218.29	126.71	101.54	
09:06:30		218.71	126.29	101.96	
09:07:10		219.17	125.83	102.42	
09:07:40		219.82	125.18	103.07	
09:08	152.4				
09:08:10		220.08	124.92	103.33	
09:08:30		220.71	124.29	103.96	
09:09:10		221.13	123.88	104.38	
09:10:40		221.44	123.56	104.69	
09:11:10		221.71	123.29	104.96	
09:11:35		222.04	122.96	105.29	
09:12:05		222.57	122.43	105.82	
09:12:35		222.77	122.23	106.02	
09:13:10		223.13	121.88	106.38	
09:13:40		223.52	121.48	106.77	
09:14	150.9				
09:14:10		223.74	121.26	106.99	
09:15:40		224.14	120.86	107.39	
09:16:25		224.68	120.32	107.93	
09:18:20		225.25	119.75	108.50	
09:19:00		225.74	119.26	108.99	
09:19:20		226.04	118.96	109.29	
09:19:40		226.14	118.86	109.39	
09:20:10		226.34	118.66	109.59	
09:20:25		226.68	118.32	109.93	
09:20:50		226.74	118.26	109.99	
09:21:20		227.20	117.80	110.45	
09:21:45		227.34	117.66	110.59	
09:22	149.8				
09:22:20		227.58	117.42	110.83	
09:22:50		227.84	117.16	111.09	
09:23:15		228.01	116.99	111.26	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
09:23:40		228.05	116.95	111.30	
09:24:00		228.27	116.73	111.52	
09:24:40		228.60	116.40	111.85	
09:25:10		228.88	116.13	112.13	
09:25:25		229	116	112.25	
09:25:50		229.38	115.63	112.63	
09:26:10		229.64	115.36	112.89	
09:26:40		229.93	115.07	113.18	
09:27:10		230.08	114.92	113.33	
09:27:30		230.33	114.67	113.58	
09:28:00		230.66	114.34	113.91	
09:28:50		231.96	113.04	115.21	
09:29:20		221.34	123.66	104.59	
09:29:50		221.68	123.32	104.93	
09:30	153.0				
09:30:20		232.16	112.84	115.41	
09:30:50		232.38	112.63	115.63	
09:31:20		232.57	112.43	115.82	
09:31:50		232.86	112.14	116.11	
09:32:20		233.26	111.74	116.51	
09:32:50		233.53	111.47	116.78	
09:33:20		233.58	111.42	116.83	
09:33:50		234.04	110.96	117.29	
09:34:20		234.24	110.76	117.49	
09:34:50		234.50	110.50	117.75	
09:35:20		234.73	110.27	117.98	
09:35:50		235.04	109.96	118.29	
09:36:20		235.31	109.69	118.56	
09:36:50		235.46	109.54	118.71	
09:37:20		235.54	109.46	118.79	
09:37:50		235.95	109.05	119.20	
09:38:20		236.21	108.79	119.46	
09:38:50		236.42	108.58	119.67	
09:39:20		236.58	108.42	119.83	
09:39:50		236.88	108.13	120.13	
09:40:20		237.24	107.76	120.49	
09:40:50		237.59	107.41	120.84	
09:41:20		237.88	107.13	121.13	
09:41:50		238.22	106.78	121.47	
09:42:20		238.58	106.42	121.83	
09:42:50		238.88	106.13	122.13	
09:43:20		239.20	105.80	122.45	
09:43:50		239.54	105.46	122.79	
09:44:20		239.83	105.17	123.08	
09:44:50		240.08	104.92	123.33	
09:45	158.6	240	105	123.25	
09:45:20		240.36	104.64	123.61	
09:45:50		240.59	104.41	123.84	
09:46:50		241.30	103.70	124.55	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
09:47:20		241.59	103.41	124.84	
09:47:50		241.56	103.44	124.81	
09:48:20		241.68	103.32	124.93	
09:48:50		241.86	103.14	125.11	
09:49:20		241.88	103.13	125.13	
09:49:50		241.86	103.14	125.11	
09:50:20		241.84	103.16	125.09	
09:50:50		241.77	103.23	125.02	
09:51:20		241.90	103.10	125.15	
09:51:50		241.95	103.05	125.20	
09:52:20		241.83	103.17	125.08	
09:52:50		241.96	103.04	125.21	
09:53:20		242	103	125.25	
09:53:50		242	103	125.25	
09:54:20		242	103	125.25	
09:54:50		242.07	102.93	125.32	
09:55:20		242.07	102.93	125.32	
09:55:50		242.13	102.88	125.38	
09:56:20		242.10	102.90	125.35	
09:56:50		242.22	102.78	125.47	
09:57:20		242.29	102.71	125.54	
09:57:50		242.38	102.63	125.63	
09:58:20		242.29	102.71	125.54	
09:58:50		242.33	102.67	125.58	
09:59:20		242.45	102.55	125.70	
09:59:50		242.48	102.52	125.73	
10:00	144.6				
10:00:20		242.54	102.46	125.79	
10:00:50		242.54	102.46	125.79	
10:01:20		242.61	102.39	125.86	
10:01:50		242	103	125.25	
10:02:20		242.70	102.30	125.95	
10:02:50		242.81	102.19	126.06	
10:03:20		242.83	102.17	126.08	
10:03:50		242.93	102.07	126.18	
10:04:20		243.04	101.96	126.29	
10:04:50		243.06	101.94	126.31	
10:05:20		243.13	101.88	126.38	
10:05:50		243.16	101.84	126.41	
10:06:20		243.24	101.76	126.49	
10:06:50		243.24	101.76	126.49	
10:07:20		243	102	126.25	
10:07:50		243.44	101.56	126.69	
10:08:20		243.48	101.52	126.73	
10:08:50		243.44	101.56	126.69	
10:09:20		243.48	101.52	126.73	
10:09:50		243.51	101.49	126.76	
10:10:20		243.63	101.38	126.88	
10:10:50		243.68	101.32	126.93	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
10:11:20		243.65	101.35	126.90	
10:11:50		243.71	101.29	126.96	
10:12:20		243.82	101.18	127.07	
10:12:50		243.75	101.25	127	
10:13:20		243.86	101.14	127.11	
10:13:50		243.92	101.08	127.17	
10:14:20		243.91	101.09	127.16	
10:15	147.4				
10:15:20		243.98	101.02	127.23	
10:15:50		243.92	101.08	127.17	
10:16:20		244	101	127.25	
10:16:50		244.01	100.99	127.26	
10:17:20		244.08	100.92	127.33	
10:18:20		244.15	100.85	127.40	
10:19:20		244.17	100.83	127.42	
10:20:20		244.27	100.73	127.52	
10:23		244.39	100.61	127.64	
10:30	153.2	244.94	100.06	128.19	
10:35		245.35	99.65	128.60	
10:40		245.63	99.38	128.88	
10:45	148.5	245.90	99.10	129.15	
10:50		246.04	98.96	129.29	
10:55		246.21	98.79	129.46	
11:00		246.23	98.77	129.48	
11:05		245.71	99.29	128.96	
11:10		245.40	99.60	128.65	
11:15	146.3	245.13	99.88	128.38	
11:20		245.09	99.91	128.34	
11:25		245.08	99.92	128.33	
11:30		245.13	99.88	128.38	
11:35		245.29	99.71	128.54	
11:40		245.27	99.73	128.52	
11:45		245.29	99.71	128.54	
11:50		245.29	99.71	128.54	
11:55		245.48	99.52	128.73	
12:00		245.46	99.54	128.71	
12:05		245.44	99.56	128.69	
12:10		245.35	99.65	128.60	
12:15		245.41	99.59	128.66	
12:20		245.42	99.58	128.67	
12:25		245.48	99.52	128.73	
12:30		245.49	99.51	128.74	
12:35		245.40	99.60	128.65	
12:40		245.44	99.56	128.69	
12:45	150.9	245.46	99.54	128.71	
12:50		245.60	99.40	128.85	
12:55		245.79	99.21	129.04	
13:00		245.83	99.17	129.08	
13:05		245.99	99.01	129.24	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
13:10		246.21	98.79	129.46	
13:15		246.50	98.50	129.75	
13:20		246.71	98.29	129.96	
13:25		247.13	97.88	130.38	
13:30		247.50	97.50	130.75	
13:35		247.52	97.48	130.77	
13:40		247.77	97.23	131.02	
13:45		247.67	97.33	130.92	
13:50		247.92	97.08	131.17	
13:55		248.04	96.96	131.29	
14:00	145.2	248	97	131.25	Took water sample.
14:05		248	97	131.25	
14:10		247.96	97.04	131.21	
14:15		247.96	97.04	131.21	
14:20		248.50	96.50	131.75	
14:25		249.08	95.92	132.33	
14:30		249.46	95.54	132.71	
14:35		249.88	95.13	133.13	
14:40		250.42	94.58	133.67	
14:42					Water temp.: 25
deg.C.					
14:45		250.83	94.17	134.08	
14:50	142.9	251	94	134.25	
15:00		251.10	93.90	134.35	
15:30		251.33	93.67	134.58	
16:00	149.5	252.13	92.88	135.38	
17:00	142.5	257.71	87.29	140.96	
	REMARKS:	Adjusted flow rate back to 150 gpm			
18:00	147.9	268.73	76.27	151.98	
19:00	146.2	271.54	73.46	154.79	
20:00	145.0	273.21	71.79	156.46	
	REMARKS:	Change shift.			
21:00	145.4	278.92	66.08	162.17	
22:00	144.5	275.33	69.67	158.58	Took water sample.
23:00	145.4	278.92	66.08	162.17	
7/21/98					
00:00	143.2	278	67	161.25	
01:00	146.1	278.08	66.92	161.33	
02:00	144.7	282.42	62.58	165.67	
03:00	142.7	283.25	61.75	166.50	
04:00	145.9	283	62	166.25	Took water sample.
05:00	143.9	288.25	56.75	171.50	
06:00	146.7	290.75	54.25	174	
07:00	147.1	300.04	44.96	183.29	
08:00	144.9	299.25	45.75	182.50	
09:00	145.1	299.50	45.50	182.75	
10:00	141.9	298.60	46.40	181.85	Adjusted flow rate
11:00	144.7	300.15	44.85	183.40	

r-45X

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
02:00	143.6	358.75	-13.75	242	
02:30	REMARKS:	Opened valve			
03:00	144.9	360.08	-15.08	243.33	
03:40	REMARKS:	Opened valvE			
04:00	147.9	363	-18	246.25	
04:30	REMARKS:	Opened valve			
05:00	143.6	366.75	-21.75	250	
05:15	REMARKS:	Opened valve			
06:00	148.1	371.08	-26.08	254.33	
07:00	144.4	371.04	-26.04	254.29	
08:00	146.2	371.24	-26.24	254.49	
09:00	144.0	372.02	-27.02	255.27	
09:16	REMARKS:	Opened valve			
09:44	REMARKS:	Opened valve			
10:00	144.9	375.13	-30.13	258.38	
10:30	REMARKS:	Adjusting flow rate to 136 gpm (44sec/100gal)			
11:00	135.3	366	-21	249.25	
12:00	139.4	359.14	-14.14	242.39	
13:00	136.7	354.81	-9.81	238.06	
14:00	137.9	353	-8	236.25	
15:00	137.0	352.42	-7.42	235.67	
16:00	137.0	351.64	-6.64	234.89	
16:30	REMARKS:	Took water sample.			
17:00	136.6	353.67	-8.67	236.92	
18:00	137.0	352.76	-7.76	236.01	
19:00	136.0	353.21	-8.21	236.46	
20:00	138.2	353.71	-8.71	236.96	
21:00	137.7	354.29	-9.29	237.54	
22:00	135.7	353.50	-8.50	236.75	
23:00	140.3	351.33	-6.33	234.58	
23:05	REMARKS:	Closed valve.			
7/24/98					
00:00	134.5	352.33	-7.33	235.58	
00:05	REMARKS:	Opened valve.			
01:00	135.4	352.75	-7.75	236	
02:00	135.4	350.17	-5.17	233.42	
03:00	137.0	351	-6	234.25	
04:00	135.6	349.67	-4.67	232.92	
05:00	135.8	351.33	-6.33	234.58	
06:00	136.4	350.77	-5.77	234.02	
06:30	REMARKS:	Opened valve.			
07:00	136.3	349.85	-4.85	233.10	
08:00	136.7	351.46	-6.46	234.71	
08:30	135.9	351.13	-6.13	234.38	
09:00	135.4	350.23	-5.23	233.48	
09:30	135.7	351.06	-6.06	234.31	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
10:00	135.3	351.38	-6.38	234.63	
11:00	135.2	349.15	-4.15	232.40	
11:30	134.7	349.74	-4.74	232.99	
12:00	136.0	350.08	-5.08	233.33	
12:45	REMARKS:	Closed valve			
13:00	134.3	351.83	-6.83	235.08	
13:30	REMARKS:	Changed flow rate to 130 gpm			
14:00	130.7	341	4	224.25	
15:00	131.1	337.71	7.29	220.96	
16:00	131.1	337	8	220.25	
17:00	129.8	337.79	7.21	221.04	
18:00	130.2	335.58	9.42	218.83	
19:00	129.9	335.63	9.38	218.88	
20:00	130.8	336.71	8.29	219.96	
21:00	130.4	336.83	8.17	220.08	
22:00	130.9	335.17	9.83	218.42	
23:00	131.3	336.21	8.79	219.46	
7/25/98	Saturday				
00:00	131.2	335.46	9.54	218.71	
00:05	REMARKS:	Opened valve.			
01:00	135.6	335.46	9.54	218.71	
01:05	REMARKS:	Closed valve.			
02:00	128.5	331.92	13.08	215.17	
03:00	130.3	332.13	12.88	215.38	
04:00	129.6	331.63	13.38	214.88	
05:00	129.3	330.92	14.08	214.17	
06:00	129.5	329.77	15.23	213.02	
06:30	REMARKS:	Opened valve.			
07:00	130.6	330.25	14.75	213.50	
08:00	129.8	331.65	13.35	214.90	
09:00	129.6	329.76	15.24	213.01	
10:00	130.1	328.40	16.60	211.65	
11:00	131.7	331.67	13.33	214.92	
12:00	129.5	330.03	14.97	213.28	
13:00	129.7	329.32	15.68	212.57	
14:00	130.5	329.78	15.22	213.03	
15:00	130.7	329.08	15.92	212.33	
15:45	REMARKS:	Opened valve.			
16:00	130.4	330.32	14.68	213.57	
17:00	131.9	331.86	13.14	215.11	
17:45	REMARKS:	Closed valve.			
18:00	130.5	331.40	13.60	214.65	
19:00	130.2	330.10	14.90	213.35	
20:00	130.7	329.55	15.45	212.80	
21:00	130.1	329.42	15.58	212.67	
21:40	REMARKS:	Closed valve			

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
22:00	131.2	329.44	15.56	212.69	
22:30	REMARKS:	Opened valve.			
23:00	131.2	329.44	15.56	212.69	
7/26/98	Sunday				
00:00	130.8	329.90	15.10	213.15	
01:00	130.6	328.48	16.52	211.73	
02:00	130.8	328.31	16.69	211.56	
03:00	130.8	330.50	14.50	213.75	
04:00	131.2	330.42	14.58	213.67	
05:00	131.0	330	15	213.25	
05:30	REMARKS:	Closed valve.			
06:00	130.5	329.83	15.17	213.08	
07:00	130.3	330.08	14.92	213.33	
07:30	REMARKS:	Opened valve.			
08:00	130.4	328.46	16.54	211.71	
09:00	131.2	330.16	14.84	213.41	
10:00	129.5	327.88	17.13	211.13	
11:00	129.5	327.08	17.92	210.33	
12:00	130.2	328.13	16.88	211.38	
13:00	130.4	327.24	17.76	210.49	
14:00	129.3	327.10	17.90	210.35	
15:00	130.2	326.23	18.77	209.48	
16:00	130.0	324.58	20.42	207.83	
17:00	129.9	324.52	20.48	207.77	
18:00	130.3	325.15	19.85	208.40	
19:00	130.1	325.55	19.45	208.80	
20:00	130.5	327.10	17.90	210.35	
21:00	130.9	327.97	17.03	211.22	
22:00	130.3	326.88	18.13	210.13	
23:00	130.0	327.98	17.02	211.23	
7/27/98	Monday				
00:00	129.6	326.65	18.35	209.90	
01:00	129.4	326.75	18.25	210	
02:00	129.1	325.69	19.31	208.94	
03:00	129.6	325.09	19.91	208.34	
04:00	129.3	323.50	21.50	206.75	
05:00	129.1	323.38	21.63	206.63	
06:00	129.8	323.69	21.31	206.94	
07:00	131.5	325.67	19.33	208.92	
08:00	130.8	326.92	18.08	210.17	
09:00	129.6	324.35	20.65	207.60	
10:00	128.8	323.33	21.67	206.58	
11:00	129.6	324.11	20.89	207.36	
12:00	129.8	324.24	20.76	207.49	
13:00	129.5	323.56	21.44	206.81	
14:00	129.8	324.24	20.76	207.49	
15:00	129.9	324.94	20.06	208.19	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
16:00	129.3	323.34	21.66	206.59	
17:00	129.8	323.97	21.03	207.22	
18:00	129.7	325.75	19.25	209	
19:00	130.8	325.59	19.41	208.84	
20:00	129.5	325.09	19.91	208.34	
21:00	131.2	323.83	21.17	207.08	
22:00	129.8	323.67	21.33	206.92	
23:00	130.0	323.51	21.49	206.76	
7/28/98	Tuesday				
00:00	129.4	322.79	22.21	206.04	
01:00	129.5	322.67	22.33	205.92	
02:00	130.3	322.46	22.54	205.71	
03:00	129.4	322.21	22.79	205.46	
04:00	129.5	321.04	23.96	204.29	
05:00	130.0	321.13	23.88	204.38	
06:00	130.6	321.34	23.66	204.59	
07:00	129.3	321.59	23.41	204.84	
08:00	129.7	321.41	23.59	204.66	
09:00	129.3	320.81	24.19	204.06	
10:00	129.0	320.17	24.83	203.42	
11:00	129.7	320.74	24.26	203.99	
12:00	130.1	321.55	23.45	204.80	
13:00	129.6	321.21	23.79	204.46	
14:00	129.4	321.59	23.41	204.84	
15:00	129.3	322.09	22.91	205.34	
16:00	129.6	323.19	21.81	206.44	
17:00	129.3	321.29	23.71	204.54	
18:00	130.1	322.47	22.53	205.72	
19:00	130.6	322.29	22.71	205.54	
20:00	130.1	322.68	22.32	205.93	
21:00	129.9	322.99	22.01	206.24	
22:00	130.0	323	22	206.25	
23:00	130.3	322.96	22.04	206.21	
7/29/98	Wednesday				
00:00	129.9	323.52	21.48	206.77	
01:00	131.7	324.10	20.90	207.35	
02:00	129.8	322.13	22.88	205.38	
03:00	130.4	321.42	23.58	204.67	
04:00	131.5	323.98	21.02	207.23	
05:00	129.5	323.17	21.83	206.42	
06:00	130.8	323.14	21.86	206.39	
07:00	130.3	323.56	21.44	206.81	
08:00	130.2	324.50	20.50	207.75	
09:00	130.3	323.65	21.35	206.90	
10:00	129.5	322.81	22.19	206.06	
11:00	129.7	322.44	22.56	205.69	
12:00	130.0	322.46	22.54	205.71	

Time	Flow (gpm)	Depth to Water (feet)	Water level Elevation (feet)	Drawdown (feet)	Remarks
13:00	130.7	323.32	21.68	206.57	
14:00	130.0	323.63	21.38	206.88	
15:00	130.0	324.46	20.54	207.71	
16:00	130.2	323.33	21.67	206.58	
17:00	130.4	321.96	23.04	205.21	
18:00	129.9	322.74	22.26	205.99	
19:00	130.2	322.50	22.50	205.75	
20:00	129.6	322.41	22.59	205.66	
21:00	129.6	323	22	206.25	
22:00	129.5	322.71	22.29	205.96	
23:00	129.7	322.80	22.20	206.05	
7/30/98	Thursday				
00:00	130.5	322.42	22.58	205.67	
01:00	129.8	322.65	22.35	205.90	
02:00	130.2	322.47	22.53	205.72	
03:00	129.6	322.92	22.08	206.17	
04:00	130.5	322.42	22.58	205.67	
05:00	130.2	322.75	22.25	206	
06:00	130.7	321.96	23.04	205.21	
07:00	129.6	321.56	23.44	204.81	
08:00	129.5	320.92	24.08	204.17	
09:00	129.4	321.17	23.83	204.42	
09:15:00					Shut down.

PUKAKI WELL - CONSTANT-RATE TEST
Date Started: July 20, 1998
SHUT DOWN - July 30, 1998

Time	Depth to Water (feet)	Elevation (ft)	Drawdown (feet)	Remarks
7/30/98	Thursday			
09:15:00	REMARKS:	Shut down.		
09:15:52	283	62	166.25	
09:15:58	280	65	163.25	
09:16:03	278	67	161.25	
09:16:08	274	71	157.25	
09:16:11	273	72	156.25	
09:16:14	272	73	155.25	
09:16:17	271	74	154.25	
09:16:19	270	75	153.25	
09:16:21	269	76	152.25	
09:16:23	268	77	151.25	
09:16:27	267	78	150.25	
09:16:31	266	79	149.25	
09:16:35	265	80	148.25	

Time	Depth to Water (feet)	Elevation (ft)	Drawdown (feet)	Remarks
09:28:23	214	131	97.25	
09:28:40	213	132	96.25	
09:28:56	212	133	95.25	
09:29:13	211	134	94.25	
09:29:30	210	135	93.25	
09:29:47	209	136	92.25	
09:30:05	208	137	91.25	
09:30:22	207	138	90.25	
09:30:40	206	139	89.25	
09:30:59	205	140	88.25	
09:31:17	204	141	87.25	
09:31:36	203	142	86.25	
09:31:55	202	143	85.25	
09:32:14	201	144	84.25	
09:32:32	200	145	83.25	
09:32:52	199	146	82.25	
09:33:12	198	147	81.25	
09:33:32	197	148	80.25	
09:33:52	196	149	79.25	
09:34:14	195	150	78.25	
09:34:35	194	151	77.25	
09:34:56	193	152	76.25	
09:35:19	192	153	75.25	
09:35:41	191	154	74.25	
09:36:04	190	155	73.25	
09:36:28	189	156	72.25	
09:36:52	188	157	71.25	
09:37:17	187	158	70.25	
09:37:44	186	159	69.25	
09:38:11	185	160	68.25	
09:38:42	184	161	67.25	
09:39:16	183	162	66.25	
09:39:51	182	163	65.25	
09:40:28	181	164	64.25	
09:41:05	180	165	63.25	
09:41:44	179	166	62.25	
09:42:24	178	167	61.25	
09:43:08	177	168	60.25	
09:44:02	176	169	59.25	
09:44:57	175	170	58.25	
09:45:52	174	171	57.25	
09:46:46	173	172	56.25	
09:47:42	172	173	55.25	
09:48:37	171	174	54.25	
09:49:35	170	175	53.25	
09:50:35	169	176	52.25	
09:51:39	168	177	51.25	
09:52:43	167	178	50.25	
09:53:48	166	179	49.25	
09:54:58	165	180	48.25	

Time	Depth to Water (feet)	Elevation (ft)	Drawdown (feet)	Remarks
09:56:10	164	181	47.25	
09:57:28	163	182	46.25	
09:58:56	162	183	45.25	
10:00:23	161	184	44.25	
10:01:53	160	185	43.25	
10:03:30	159	186	42.25	
10:05:14	158	187	41.25	
10:07:14	157	188	40.25	
10:09:25	156	189	39.25	
10:11:55	155	190	38.25	
10:14:34	154	191	37.25	
10:17:46	153	192	36.25	
10:21:29	152	193	35.25	
10:25:54	151	194	34.25	
10:31:20	150	195	33.25	
10:38:06	149	196	32.25	
10:43	148.44	196.56	31.69	
10:48	147.94	197.06	31.19	
10:53	147.49	197.51	30.74	
10:58	147.10	197.90	30.35	
11:03	146.75	198.25	30	
11:08	146.44	198.56	29.69	
11:13	146.14	198.86	29.39	
11:18	145.81	199.19	29.06	
11:23	145.49	199.51	28.74	
11:28	145.20	199.80	28.45	
11:33	144.93	200.07	28.18	
11:38	144.67	200.33	27.92	
11:43	144.43	200.57	27.68	
11:48	144.22	200.78	27.47	
11:53	144	201	27.25	
11:58	143.77	201.23	27.02	
12:03	143.59	201.41	26.84	
12:08	143.36	201.64	26.61	
12:13	143.17	201.83	26.42	
12:18	143.04	201.96	26.29	
12:23	142.84	202.16	26.09	
12:40	142.29	202.71	25.54	
12:55	141.78	203.22	25.03	
13:10	141.33	203.67	24.58	
13:25	140.80	204.20	24.05	
13:40	140.59	204.41	23.84	
13:55	140.20	204.80	23.45	
14:10	140.85	204.15	24.10	
14:25	139.57	205.43	22.82	
14:40	139.23	205.77	22.48	
14:55	139	206	22.25	

Time	Depth to Water (feet)	Elevation (ft)	Drawdown (feet)	Remarks
7/31/98				
08:00	130.27	214.73	13.52	
12:00	129.28	215.72	12.53	
15:00	128.43	216.57	11.68	

USGS Monitor Well - Pukaki

(To monitor constant rate well testing of the (DOW) Pukaki Well, which started at 9:00 am, 7/20/98)

(Measurements prior to those listed were made by Steve Gingrich, USGS)

(All measurements are from the lip of the sensor housing to water level. Approximate measuring point elevation: 322' msl.)

Time	USGS Sensor	Contractor Sensor
7/20/98		
15:00	156.40	
16:00	156.81	
17:00	157.17	
18:00	157.46	
19:00	157.80	
20:00	158.35	
21:00	159.03	
22:00	159.85	
23:00	159.90	
7/21/98		
0:00	159.98	
01:00	159.75	
02:00	159.91	
03:00	159.90	
04:00	160.05	
05:00	160.55	
06:00	160.65	
07:00	161.90	
08:00	162.10	
09:00	162.25	
10:00	162.40	
11:00	162.53	
12:00	162.65	
13:00	162.81	
14:00	162.94	
15:00	163.02	
16:00	163.20	
17:00	163.20	
18:00	163.45	
19:00	163.62	
20:00	164.00	
21:00	164.36	
22:00	164.39	
23:00	164.45	
7/22/98		
0:00	164.55	
01:00	164.80	
02:00	164.25	

Time	USGS Sensor	Contractor Sensor
03:00	164.35	
04:00	164.55	
05:00	164.50	
06:00	164.51	
07:00	164.60	
08:00	164.72	
09:00	164.81	
10:00	164.92	
11:00	165.00	
12:00	165.02	
13:00	165.11	
14:00	165.14	
15:00	165.22	
16:00	165.30	
17:00	165.38	
18:00	165.40	
19:00	165.42	
20:00	165.46	
21:00	165.44	
22:00	165.60	
23:00	165.65	
7/23/98		
0:00	165.61	
01:00	165.60	
02:00	165.55	
03:00	165.57	
04:00	165.58	
05:00	165.60	
06:00	165.48	
07:00	165.60 ?	
08:00	165.60 ?	
09:00	165.60 ?	
10:00	165.60 ?	
11:00	165.60 ?	
12:00		
13:00	164.89 ?	
14:00	164.05	
14:30		162.73
15:00		166.26
16:00		163.20
17:00		163.26
18:00		163.20
19:00		162.42
20:00		163
21:30		163.10
22:00		163.20
23:00		163.15
7/24/98		
0:00		163.10

Time	USGS Sensor	Contractor Sensor
01:00		163.15
02:00		163.25
03:00		163.20
04:00		163.45
05:00		163.30
06:00		
07:00		162.88
08:00		162.17
09:00		162.24
10:00		162.31
11:00		162.35
12:00		162.31
13:00		162.29
13:21	Adjusted flow rate to 130 gpm	
14:00		162.31
15:00		162.32
16:00		162.33
17:00		162.34
18:00		162.38
19:00		162.34
20:00		162.34
21:30		162.38
22:00		162.35
23:00		162.33
7/25/98	Saturday	
0:00		162.34
01:00		162.35
02:00		162.35
03:00		162.35
04:00		162.35
05:00		162.35
06:00		162.35
07:00		162.35
08:00		162.35
09:00		162.34
10:00		162.34
11:00		162.33
12:00		162.33
13:00		162.34
14:00		162.35
15:00		162.33
16:00		162.34
17:00		162.33
18:00		162.33
19:00		162.35
20:00		162.35
21:00		162.34
22:00		162.33
23:00		162.34

Time	USGS Sensor	Contractor Sensor
7/26/98	Sunday	
0:00		162.36
01:00		162.35
02:00		162.32
03:00		162.34
04:00		162.34
05:00		162.32
06:00		162.33
07:00		162.34
08:00		162.34
09:00		162.33
10:00		162.33
11:00		162.33
12:00		162.32
13:00		162.32
14:00		162.33
15:00		162.31
16:00		162.33
17:00		162.31
18:00		162.32
19:00		162.34
20:00		162.32
21:00		162.34
22:00		162.35
23:00		162.35
7/27/98	Monday	
0:00		162.34
01:00		162.35
02:00		162.34
03:00		162.34
04:00		162.35
05:00		162.34
06:00		162.34
07:00		162.33
08:00		162.33
09:00		162.33
10:00		162.34
11:00		162.26
12:00		162.27
13:00		162.32
14:00		162.33
15:00		162.33
16:00		162.32
17:00		162.33
18:00		162.33
19:00		162.32
20:00		162.33
21:00		162.29
22:00		162.32
23:00		162.31

Time	USGS Sensor	Contractor Sensor
7/28/98	Tuesday	
0:00		162.30
01:00		162.29
02:00		162.30
03:00		162.31
04:00		162.30
05:00		162.31
06:00		162.29
07:00		162.29
08:00		162.29
09:00		162.33
10:00		162.33
11:00		162.29
12:00		162.29
13:00		162.29
14:00		162.29
15:00		162.29
16:00		162.29
17:00		162.28
18:00		162.29
19:00		162.29
20:00		162.28
21:00		162.28
22:00		162.29
23:00		162.29
7/29/98	Wednesday	
0:00		162.28
01:00		162.28
02:00		162.28
03:00		162.28
04:00		162.29
05:00		162.30
06:00		162.29
07:00		162.29
08:00		162.29
09:00		162.27
10:00		162.29
11:00		162.29
12:00		162.28
13:00		162.29
14:00		162.29
15:00		162.30
16:00		162.29
17:00		162.29
18:00		162.29
19:00		162.30
20:00		162.30
21:00		162.29
22:00		162.30
23:00		162.29

Time	USGS Sensor	Contractor Sensor
7/30/98	Thursday	
0:00		162.28
01:00		162.29
02:00		162.29
03:00		162.29
04:00		162.30
05:00		162.29
06:00		162.29
07:00		162.29
08:00		162.92
09:00		162.29
09:15	Shut down	

USGS Monitor Well - Pukaki
RECOVERY - July 30, 1998

NOTE: Shut down was at 9:15, however, contractor's sounder was not working well. Therefore, using the USGS sounder.

Time	Depth to Water (feet)
09:37:43	167.05
09:41: 3	166.95
09:42: 3	166.89
09:43: 3	166.85
09:44: 3	166.83
09:45: 3	166.81
09:47: 3	166.79
09:48: 3	166.75
09:49: 3	166.65
09:50: 3	166.57
09:51: 3	166.54
09:52: 3	166.46
09:53: 3	166.43
09:54: 3	166.40
09:55: 3	166.35
09:56: 3	166.34
09:57: 3	166.33
09:58: 3	166.26
09:59: 3	166.22
10: 0:03	166.20
10: 1:03	166.18
10: 2:03	166.14
10: 3:03	166.12
10: 4:03	166.09
10: 5:03	166.07
10: 6:03	166.03

Time	Depth to Water (feet)	
10: 7:03	165.97	
10:10:03	165.82	
10:11:03	165.75	
10:12:03	165.70	
10:13:03	165.67	
10:14:03	165.65	
10:15:03	165.62	
10:16:03	165.58	
10:17:03	165.54	
10:18:03	165.52	
10:19:03	165.52	
10:20:03	165.51	
10:21:03	165.46	
10:22:03	165.41	
10:23:03	165.38	
10:24:03	165.36	
10:25:03	165.32	
10:26:03	165.29	
10:27:03	165.27	
10:28:03	165.25	
10:29:03	165.23	
10:30:03	165.21	
10:31:03	165.18	
10:32:03	165.15	
10:33:03	165.13	
10:34:03	165.10	
10:35:03	165.08	
10:36:03	165.05	
10:37:03	165.03	
10:39:03	164.99	
10:40:03	164.96	
10:41:03	164.94	
10:42:03	164.92	
10:43:03	164.90	
10:44:03	164.88	
10:45:03	164.86	
10:46:03	164.83	
10:47:03	164.81	
10:48:03	164.78	
10:49:03	164.77	
10:50:03	164.74	
10:51:03	164.73	
10:52:03	164.71	
10:53:03	164.69	
10:54:03	164.67	
10:56:03	164.64	Contractor's sounder reading: 161.44
10:58:03	164.60	Contractor's sounder reading: 161.41
11: 0:03	164.57	Contractor's sounder reading: 161.38
11: 2:03	164.53	
11: 4:03	164.50	Contractor's sounder reading: 161.32

Time	Depth to Water (feet)	
11: 6:03	164.45	Contractor's sounder reading: 161.29
11: 8:03	164.43	Contractor's sounder reading: 161.25
11:10:03	164.40	Contractor's sounder reading: 161.21
11:12:03	164.36	
11:18:03	164.24	Contractor's sounder reading: 161.08
11:23:03	164.19	Contractor's sounder reading: 161.02
11:28:03	164.11	Contractor's sounder reading: 160.97
11:33:03	164.04	Contractor's sounder reading: 160.89
11:38:03	163.98	
11:43:03	163.90	
11:48:03	163.85	
12:12:03	163.53	
13:13:03	162.92	
13:35:03	162.70	
14:22:03	162.33	
14:44:03	162.16	
15: 5:03	162.01	
7/31/98 Friday		
8: 0:00	157.86	
12: 0:00	157.30	
15: 0:00	156.86	

CORRECTION

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

Time	Depth to Water (feet)	
11: 6:03	164.45	Contractor's sounder reading: 161.29
11: 8:03	164.43	Contractor's sounder reading: 161.25
11:10:03	164.40	Contractor's sounder reading: 161.21
11:12:03	164.36	
11:18:03	164.24	Contractor's sounder reading: 161.08
11:23:03	164.19	Contractor's sounder reading: 161.02
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11:43:03	163.90	
11:48:03	163.85	
12:12:03	163.53	
13:13:03	162.92	
13:35:03	162.70	
14:22:03	162.33	
14:44:03	162.16	
15: 5:03	162.01	
7/31/98 Friday		
8: 0:00	157.86	
12: 0:00	157.30	
15: 0:00	156.86	

PUMP TEST DATA

Hanamaulu Well No. 3

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

WELL COMPLETION REPORT

4/25/97 WCR Form

(Check Appropriate Box) ☐ Well Construction ☐ (Permanent) Pump Installation

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analyses should also be submitted. For assistance call the Commission Regulation Branch at 587-0225 or 1-800-468-4644 Extension 70225.

1. State Well No.: 0124-02 Well Name: Hanamaulu 3 Island: Kauai
2. Location/Address: Lihue Basin Tax Map Key: 3-8-2:2

PART I. WELL CONSTRUCTION REPORT

3. Drilling Company: RAINBOW DRILLING SPECIALISTS, INC
4. Name of driller who performed work: C. LEE MUELLER
5. Type of rig/construction: ROTARY - AIR FOAM - DOWN HOLE HAMMER
6. Date(s) Well Construction and pump tests (if any) completed: 10/30/98
7. GROUND ELEVATION (referenced to mean sea level, msl): _____ ft.
   Well Bench Mark (description/location): _____ Elevation(msl): _____
8. DRILLER'S LOG: *Please attach geologic log (if available or if required by permit)*

Depths (ft.)	Rock Description, Water Level, Dates, etc.	Depths (ft.)	Rock Description, Water Level, Dates, etc.
SURF to 95	RED/YELLOW BROWN MUD	200 to 560	YELLOW-BROWN MUD w/
95 to 200	GRAY WEATHERED MAFIC ROCK	____ to ____	WEATHERED MAFIC ROCK

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

9. Total depth of well below ground: 560 ft.
10. Hole size: 26 inch dia. from SURFACE ft. to 19 ft. below ground
    22 inch dia. from 19 ft. to 560 ft. below ground
    _____ inch dia. from _____ ft. to _____ ft. below ground
11. Casing installed: 12 in. I.D. x 3/8 in. wall solid section to 270 ft. below ground
    _____ in. I.D. x _____ in. wall perforated section to _____ ft. below ground
    Casing Material/Slot Size: _____
12. Annulus: Grouted from SURFACE ft. below ground to 120 ft. below ground *
    Gravel packed from _____ ft. below ground to _____ ft. below ground
13. Initial water level: 81.70 ft. below ground. Date and time of measurement: 10/12/98 0930
14. Initial chloride: _____ ppm Date and time of sampling: _____
15. Initial temperature: _____ °F Date and time of measurement: _____
16. PUMPING TESTS: Reference Point (R.P.) used: GROUND LEVEL, which elevation is _____
    (1) Step-Drawdown Test Date 10/3/98
    Start water level 31.04 ft. below R.P.
    End water level 146.91 ft. below R.P.
    (2) Long-term Aquifer Test Date 10/24/98
    Start water level 42.94 ft. below R.P.
    End water level 131.80 ft. below R.P.
17. Aquifer Pump Test Procedures data & graphs *(1/9/96 LTAT Form)* attached? __ Yes __ No
18. As-built drawings attached attached? ✓ Yes __ No
19. Other remarks/comments: *(On back of this form)*

Well Drilling Contractor (print) RAINBOW DRILLING SPECIALISTS, INC C-57 Lic. No. 19137
Signature [signature] Date 11/23/98

Surveyor (print) Ronald Casuga Lic. No. 4332
Signature See attached Date February 26, 1999

Applicant (print) COUNTY OF KAUAI, DEPT. OF WATER
Signature [signature] Date 3/12/99

WELL CONSTRUCTION PERMIT

Hanamaulu 3 Well, Well No. 0124-02

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of Hanamaulu 3 Well (Well No. 0124-02) at Lihue Basin, Kauai, TMK 3-8-2:2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences.

2. The well construction permit shall be for construction and testing of the well only. A minimum one-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

4. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and contact the Department's Historic Preservation Division (587-0045) immediately.

6. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   a. Well completion report, (attached - Part I, Well Construction Report).
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

8. The permittee shall comply with all applicable laws, rules, and ordinances, and non-compliance may be grounds for revocation of this permit.

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97).

10. The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

12. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: July 21, 1997
Expiration Date: July 21, 1997

for [signature]
MICHAEL D. WILSON, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day.

Permittee's Signature: [signature] Date: 4/6/98

Printed Name: Ernest Y. W. Lau Firm or Title: Manager & Chief Engineer

Driller's Signature: [signature] License #C 19137 Date: 4/6/98

Printed Name: C. Lee Mueller Firm or Title: Rainbow Drilling Specialists, Inc.

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Robert Vorfeld, Lihue Plantation Co.

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

REF:CWRM-SS

JUL 23 1997

Mr. Ernest Lau
Kauai Department of Water
P.O. Box 1706
Lihue, Hawaii 96766-5706

Dear Mr. Lau:

Well Construction Permit
Hanamaulu 3 (Well No. 0124-02)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) which authorizes well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 12:

Special Conditions

1. The well shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. The well shall be cased with new steel casing conforming to one of the manufacturing standards listed in Hawaii Well Construction and Pump Installation Standards (January, 1997) and in the standards of AWWA publication ANSI/AWWA A100-90, as may be amended. The physical properties of the steel shall conform to ASTM A-242, ASTM A53, Type E or S, Grade B, or approved equal. The well casing shall be manufactured in accordance with applicable sections of ASTM A139, as may be amended.

3. To prevent surface contamination, the annular space of all cased non-artesian wells (except monitor wells designed for immediate and short-term monitoring purposes and subsequent abandonment) must be sealed with grout from the ground surface to a minimum depth of 500 feet or 70% of the vertical distance between the ground surface and the top of the aquifer selected for exploration, long-term monitoring, or development, whichever depth is less.

This permit does not authorize work for your permanent pump installation. Approval and issuance of your pump installation permit is contingent upon completed application and information provided to and accepted by Commission staff as required in the Well Construction & Pump Installation Standards (1/23/97) and any special conditions performed under this permit. Please note that special conditions may simply highlight application deviations from the Standards.

The well owner is responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions.

To validate your permit, please sign and have the contractor sign both permit originals and return one for our files. Also, copies of the aquifer pump test worksheet and the well completion report form are enclosed for your use. Please provide all the information in this packet to your well drilling contractor.

Also attached for your information is a copy of the Department of Health's review comments.

If you have any questions, please call the Commission staff at 587-0218 or toll-free at 274-3141, extension 70218. Lenore

Aloha,

MICHAEL D. WILSON
Chairperson

Enclosures

LONG-TERM AQUIFER TEST DATA

Pumped Well No. 0124-02
Pumped Well Name HANAUMA
Target Q 150 gpm

Observation well no. 0124-01
Distance between Obs.& Pumped Well _____ ft.
Reference pt. for depth to water _____ ft. msl
Static Water Level @ start of test _____ ft. msl

Water level measurements by: ☐ steel tape ☑ pressure transducer ☐ airline

START TEST Date: 10/26/98 Hour of day: 08:40

Flow Meter Reading Start: 5696800 gals

Suggested elapsed time (min)	Actual elapsed time (min)	Depth to water (nearest 0.01 ft)	Drawdown (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl⁻ (mg/l)	Temp. ___°F or ___°C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
0	0	83.45	0.00				.	Start test
1							.	
1.5							.	
2							.	
2.5							.	
3							.	
4							.	
5	5	126.39	42.94	150			.	
6							.	
7							.	
8							.	
10	10	129.98	46.53	150			.	
15	15	133.70	50.25	150			.	
20	20	134.94	51.49	150			.	
25	25	138.26	54.81	150			.	
30	30	141.43	57.98	150			.	
40	40	145.96	62.51	150			.	
50	50	150.12	66.67	150			.	
60	60	152.98	69.53	150			.	
70	70	155.62	72.17	150			.	
80	80	157.73	74.28	150			.	
90	90	159.98	76.53	150			.	
100	100	160.73	77.28	150			.	
150	160	164.94	81.49	150			.	
200	200	166.14	82.69	150			.	
250	260	167.88	84.43	148.33			.	

Suggested elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.01 ft)	Drawdown s (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl (mg/l)	Temp. ___ °F or ___ °C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
300	320	169.88	86.43	148.33			.	
400	380	170.81	87.36	148.33			.	
500	500	170.82	87.37	148.33			.	
600	620	170.45	87.00	145.00			.	
700	680	169.97	86.52	146.67			.	
800	800	170.00	86.55	145.00			.	
900	920	166.14	82.69	145.00			.	
1000	980	178.07	94.62	150.00			.	
1500	1520	182.49	99.04	148.33			.	
2000	2000	183.46	100.01	146.67			.	
2500	2480	191.37	107.92	148.33			.	
3000	3020	193.32	109.87	148.33			.	
4000	4020	197.48	114.03	146.67			.	
5000	4980	200.86	117.41	148.33			.	
6000	6000	212.78	129.33	145.83			.	
7000	6120	215.25	131.80	150.00			.	
8000				.			.	
9000				.			.	
10000				.				Max possible duration, water level or quality did not stabilize for any 24 period
			Use same ending drawdown figure as start for recovery	0				Begin recovery data next page Flow meter reading at end of pumped period: 6596100 gals

SEE ATTACHED DATA SHEETS FOR MONITOR WELL DETAILS.

Suggested elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.01 ft)	Recovery s' (unadjusted to nearest 0.01 ft)	Pumping rate Q (gpm)	EC (µmhos)	Cl^- (mg/l)	Temp. ___° F or ___° C	Data in this table is for: ☐ Pumped Well ☐ Observation Well Remarks
0	0			0			.	Start recovery
1				0			.	
1.5				0			.	
2				0			.	
2.5	2.5	178.12	94.67	0			.	
3				0			.	
4				0			.	
5				0			.	
6				0			.	
7	7.5	152.29	68.84	0			.	
8				0			.	
10	12.5	134.86	51.41	0			.	
15	17.5	123.01	39.56	0			.	
20	22.5	109.84	26.39	0			.	
25	27.5	102.52	19.07	0			.	
30	32.5	98.45	15.00	0			.	
40	42.5	95.19	11.74	0			.	
50	52.5	93.67	10.22	0			.	
60	62.5	92.82	9.37	0			.	
70				0			.	
80				0			.	
90				0			.	
100				0			.	
150				0			.	
200				0			.	
250				0			.	☐ 80% recovery achieved ☐ 80% recovery not achieved

END TEST Date: 10/30/98 Hour of day: 1505

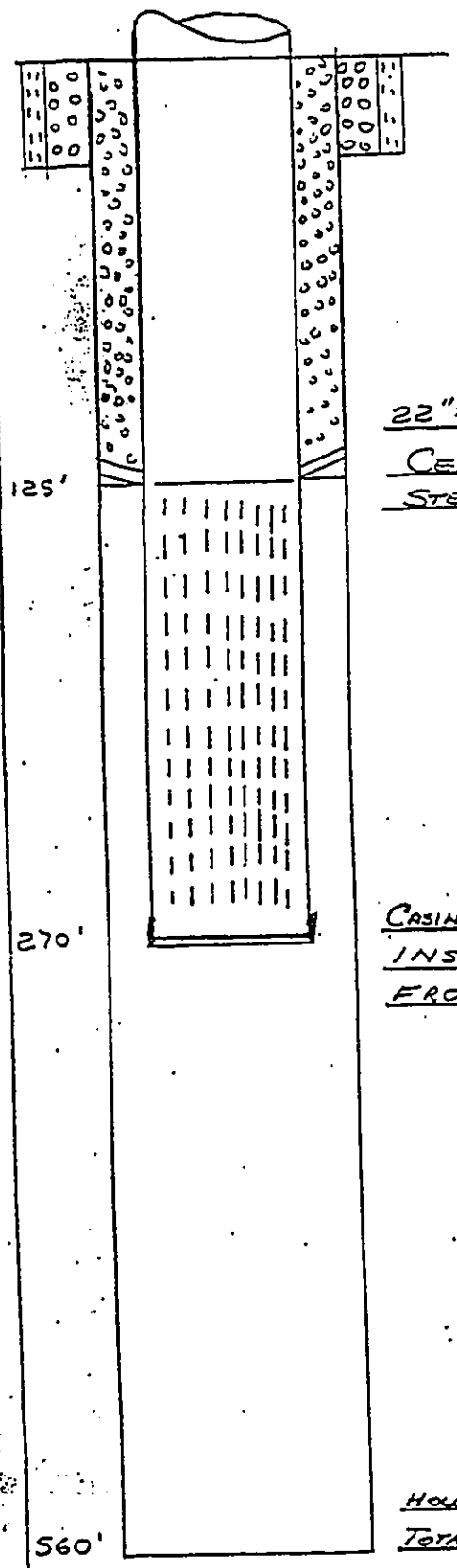
ADDITIONAL REMARKS:

Person in charge of pump test (print): C. LEE MUELLER

Signature: C. Lee Mueller

The signature above indicates that the data reported on this form is accurate and true to the best of the person's knowledge who operated this aquifer test.

CWRM LTAT Form 1/9/96



SURFACE ELEVATION MSL

26" HOLE DRILLED TO 19'

29" ID 3/8" WALL A-53 CONDUCTOR SET @ 19' AND GROUTED WITH NEAT CEMENT.

22" x 12" ANNULUS GROUTED TO SURFACE W/ 10 YD TREMIE MIX.

CEMENT BASKETS @ 125' & 120'

STEEL RING @ 125'

CASING DEPTH 270' SIZE 12" ID WALL 3/8" TYPE ASTM 242

INSTALLED AS SOLID CASING, MECANICALLY PERFORATED FROM 135' TO 265' ON 9/16/98

OWNER COUNTY OF KAUAI

WELL HANAMAULU #3

PERMIT # 0124-02 TMK 3-8-2:2

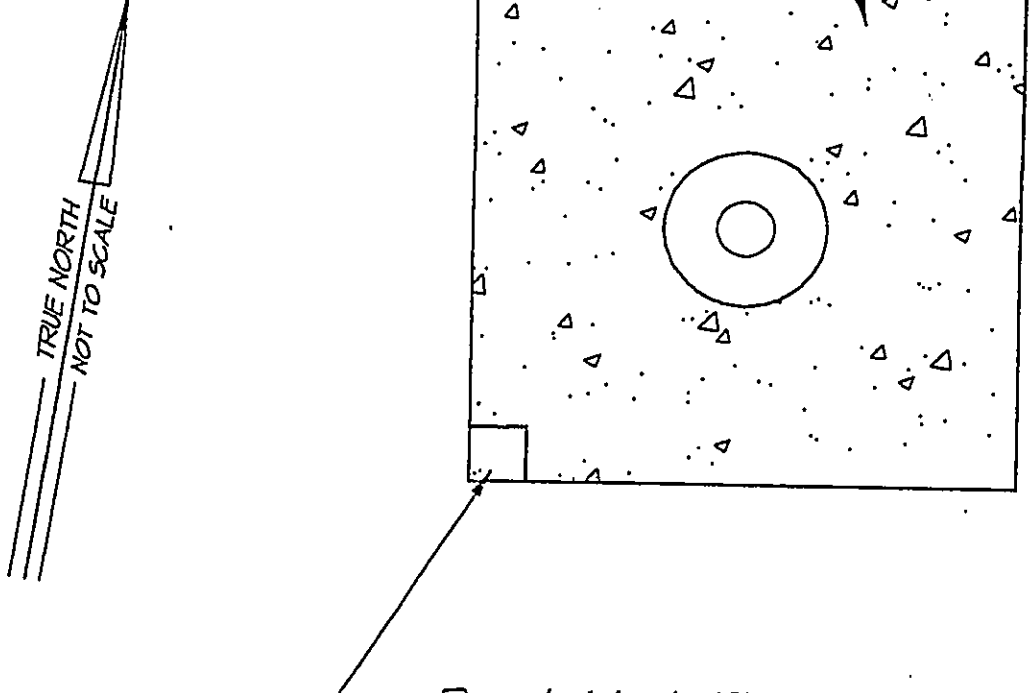
HOLE SIZE 22"

TOTAL DEPTH 560'

CONTRACTOR RAINBOW DRILLING SPECIALISTS INC

LICENSE # 19137 DATE 11/29/93

SIGNED [signature] RME



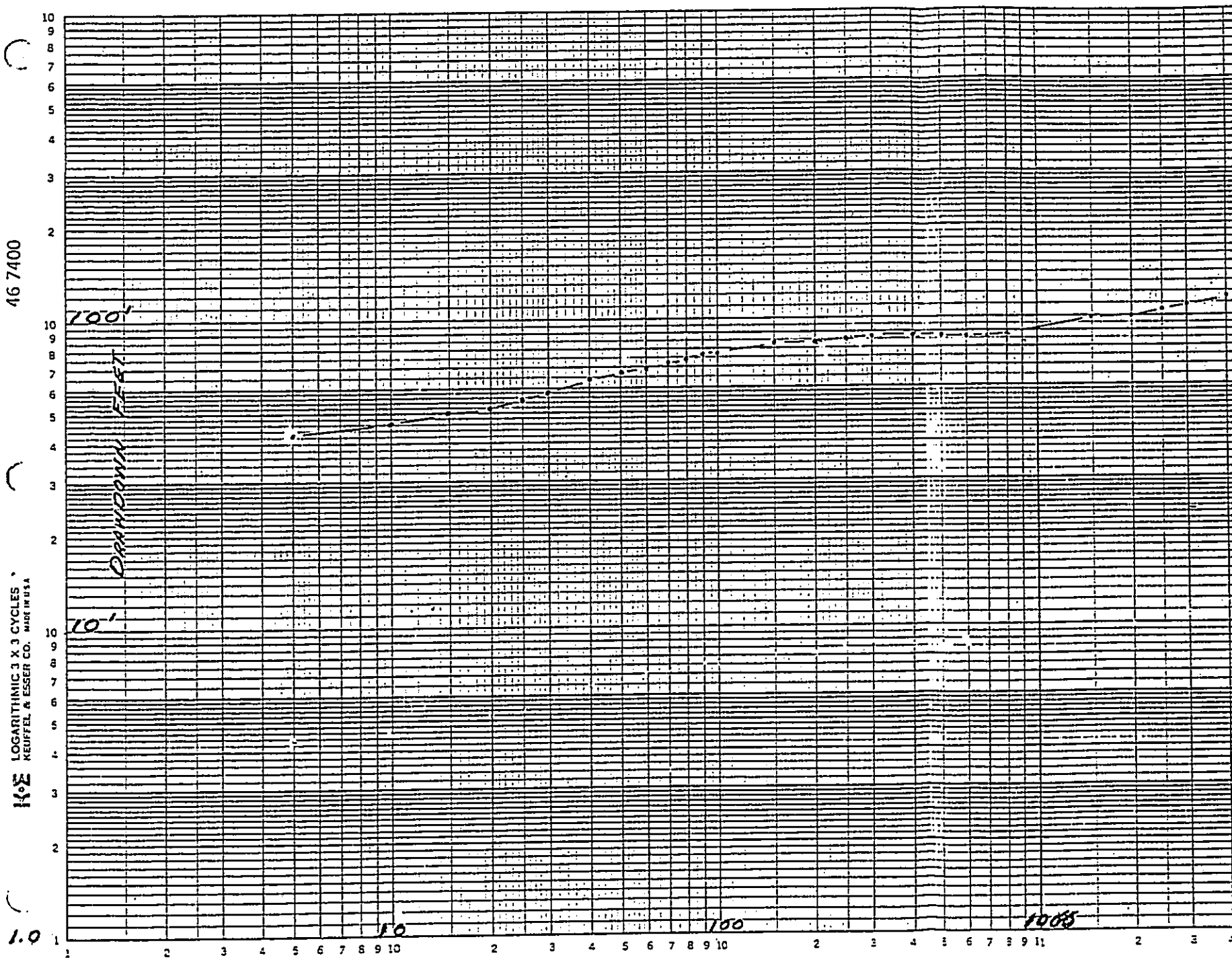
RONALD CASUGA
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4332
HAWAII; U.S.A.

THIS WORK WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION

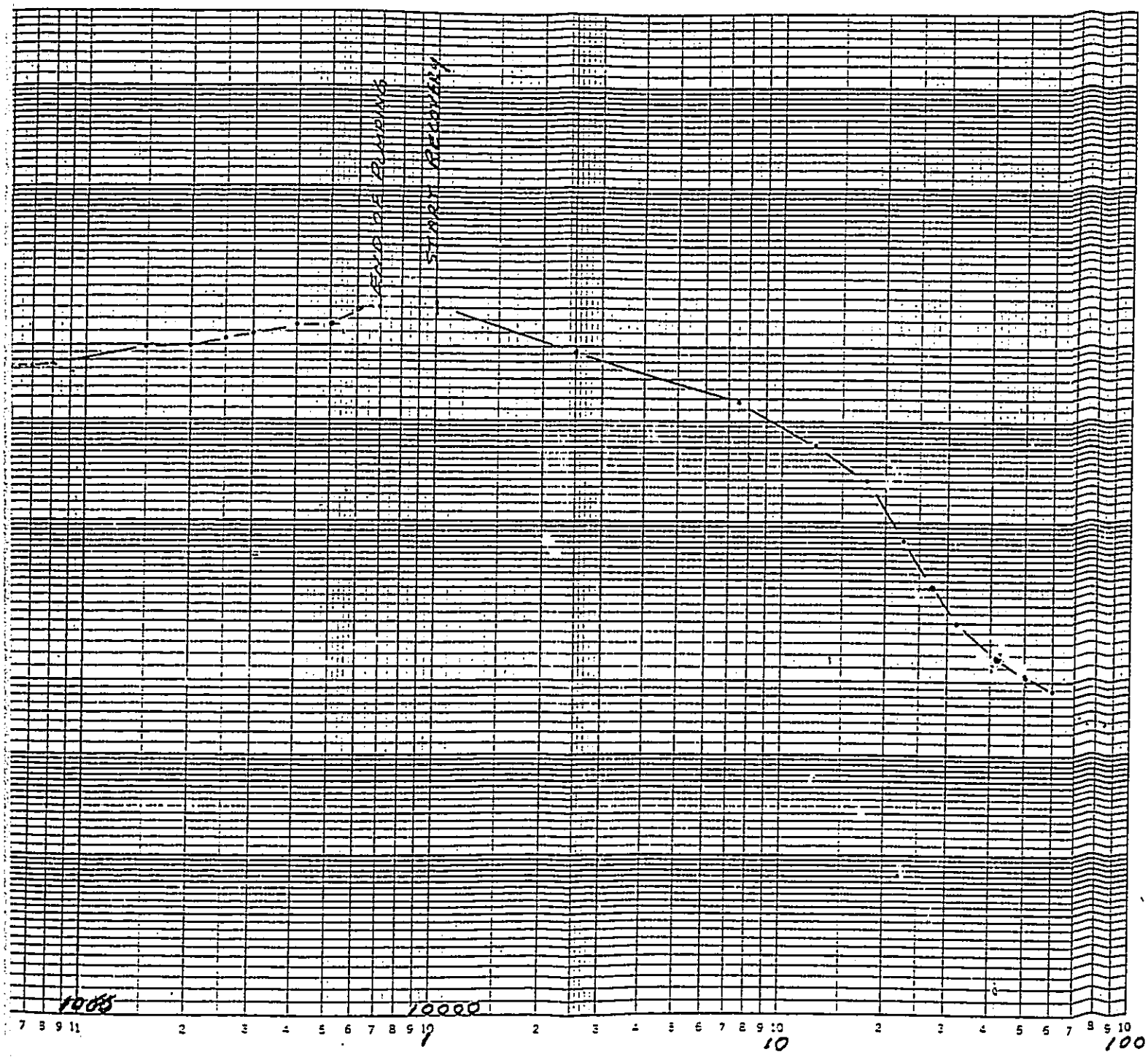
Ronald Casuga
Licensed Professional Land Surveyor
Certificate No. 4332

NEW HANAMAULU WELL

February 26, 1999


46 7400
LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.
DRAWDOWN FEET
1000'
10'
1.0
10
100
1000
TIME MINUTES

COUNTY OF KAUAI
HANAMAULU #3
PERMIT # 0124-02 TMK 3-8-2:2
LONG TERM TEST 10/26/98 RATE 150GPM



(1)

Step-Drawdown Test at Hanamaulu Well #3
Date Conducted: October 12, 1998

Time	Rate (gpm)	DTW (feet)	Drawdown (feet)		Water Level Elevation
Static Water Level:		81.70	0	466	384.30
9:09:20 Start Pumping					
9:12:50	100	112.74	31.04		353.26
9:13:50	100	111.00	29.30		355.00
9:14:50	100	111.66	29.96		354.34
9:15:50	100	111.51	29.81		354.49
9:16:50	100	111.69	29.99		354.31
9:17:50	100	111.96	30.26		354.04
9:18:50	100	112.00	30.30		354.00
9:19:50	100	112.28	30.58		353.72
9:20:50	100	112.60	30.91		353.40
9:21:50	100	112.96	31.26		353.04
9:22:50	100	113.23	31.53		352.77
9:23:50	100	113.34	31.65		352.66
9:24:50	100	113.68	31.98		352.32
9:25:50	100	113.75	32.05		352.25
9:26:50	100	114.00	32.30		352.00
9:27:50	100	114.44	32.74		351.56
9:28:50	100	114.44	32.74		351.56
9:29:50	100	114.71	33.01		351.29
9:30:50	100	114.85	33.16		351.15
9:31:50	100	115.00	33.30		351.00
9:32:50	100	115.35	33.66		350.65
9:33:50	100	115.36	33.67		350.64
9:34:50	100	115.51	33.81		350.49
9:35:50	100	115.68	33.98		350.32
9:36:50	100	115.75	34.06		350.25
9:37:50	100	115.80	34.10		350.20
9:38:50	100	115.71	34.01		350.29
9:39:50	100	115.61	33.92		350.39
9:40:50	100	115.58	33.89		350.42
9:41:50	100	115.73	34.03		350.27
9:42:50	100	115.69	33.99		350.31
9:43:50	100	115.71	34.01		350.29
9:44:50	100	115.77	34.07		350.23
9:49:50	100	116.27	34.57		349.73
9:54:50	100	116.50	34.80		349.50
9:59:50	100	117.21	35.51		348.79
10:04:50	100	117.48	35.78		348.52
10:09:50	100	117.73	36.03		348.27
10:14:50	100	118.00	36.30		348.00
10:19:50	100	118.11	36.42		347.89
10:24:50	100	118.42	36.72		347.58
10:29:50	100	118.46	36.76		347.54
10:34:50	100	118.78	37.08		347.22
10:39:50	100	118.72	37.02		347.28
10:44:50	100	118.79	37.09		347.21

(2)

Time	Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
10:49:50	Change rate to 140 gpm			
10:51:50	140	126.26	44.56	339.74
10:52:50	140	126.22	44.52	339.78
10:53:50	140	126.15	44.45	339.85
10:54:50	140	127.38	45.68	338.63
10:55:50	140	127.84	46.15	338.16
10:56:50	140	128.00	46.30	338.00
10:57:50	140	128.21	46.51	337.79
10:58:50	140	128.27	46.57	337.73
10:59:50	140	128.35	46.66	337.65
11:04:50	140	129.65	47.95	336.35
11:09:50	140	131.51	49.81	334.49
11:14:50	140	133.24	51.54	332.76
11:19:50	140	134.19	52.49	331.81
11:24:50	140	135.15	53.45	330.85
11:29:50	140	136.13	54.43	329.88
11:34:50	140	136.95	55.25	329.05
11:39:50	140	137.51	55.81	328.49
11:44:50	140	137.93	56.23	328.07
11:49:50	140	138.45	56.75	327.55
11:54:50	140	138.76	57.06	327.24
11:59:50	140	139.22	57.52	326.78
12:04:50	140	139.58	57.89	326.42
12:09:50	140	139.64	57.94	326.36
12:10:50	Change rate to 160 gpm			
12:11:50	160	142.58	60.89	323.42
12:12:50	160	144.27	62.57	321.73
12:13:50	160	145.97	64.27	320.03
12:14:50	160	147.50	65.80	318.50
12:15:50	160	148.96	67.26	317.04
12:16:50	160	149.58	67.89	316.42
12:17:50	160	150.52	68.82	315.48
12:18:50	160	151.08	69.39	314.92
12:19:50	160	151.31	69.61	314.69
12:24:50	160	151.13	69.43	314.88
12:29:50	160	150.63	68.93	315.38
12:34:50	160	153.18	71.48	312.82
12:39:50	160	156.20	74.50	309.80
12:44:50	160	157.93	76.23	308.07
12:49:50	160	159.21	77.51	306.79
12:54:50	160	160.08	78.39	305.92
12:59:50	160	160.75	79.05	305.25
13:04:50	160	161.34	79.65	304.66
13:09:50	160	161.58	79.89	304.42
13:10:20	Change rate to 200 gpm			
13:10:50	200	162.01	80.31	303.99
13:11:50	200	165.26	83.56	300.74
13:12:50	200	167.96	86.26	298.04

(3)

Time	Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
13:13:50	200	170.96	89.26	295.04
13:14:50	200	173.19	91.49	292.81
13:15:50	200	175.16	93.46	290.84
13:16:50	200	177.06	95.36	288.94
13:17:50	200	179.00	97.30	287.00
13:18:50	200	180.50	98.80	285.50
13:19:50	200	182.07	100.38	283.93
13:24:50	200	188.43	106.73	277.57
13:29:50	200	193.04	111.34	272.96
13:34:50	200	196.53	114.83	269.47
13:39:50	200	199.85	118.16	266.15
13:44:50	200	202.67	120.97	263.33
13:49:50	200	204.66	122.96	261.34
13:54:50	200	205.65	123.95	260.35
13:59:50	200	208.16	126.46	257.84
14:04:50	200	211.61	129.92	254.39
14:09:50	200	214.24	132.54	251.76
14:14:50	200	215.77	134.07	250.23
14:19:50	200	217.04	135.34	248.96
14:24:50	200	218.85	137.16	247.15
14:29:50	200	220.75	139.05	245.25
14:34:50	200	222.30	140.60	243.70
14:39:50	200	224.48	142.78	241.52
14:44:50	200	225.80	144.10	240.20
14:49:50	200	226.73	145.03	239.27
14:54:50	200	227.50	145.80	238.50
14:59:50	200	228.10	146.41	237.90

STEP TEST RECOVERY - October 12, 1998

Time	difference (seconds)	DTW	Drawdown	Water Elevation
15:00:59		218	136.30	248
15:01:30	31	217	135.30	249
15:01:40	10	216	134.30	250
15:01:48	8	215	133.30	251
15:01:54	6	214	132.30	252
15:02:01	7	213	131.30	253
15:02:10	9	212	130.30	254
15:02:17	7	211	129.30	255
15:02:24	7	210	128.30	256
15:02:36	12	209	127.30	257
15:02:51	15	208	126.30	258
15:03:00	9	207	125.30	259
15:03:13	13	206	124.30	260
15:03:23	10	205	123.30	261
15:03:35	12	204	122.30	262

(4)

Time	difference (seconds)	DTW	Drawdown	Water Elevation
15:03:44	9	203	121.30	263
15:03:53	9	202	120.30	264
15:04:02	9	201	119.30	265
15:04:11	9	200	118.30	266
15:04:20	9	199	117.30	267
15:04:30	10	198	116.30	268
15:04:39	9	197	115.30	269
15:04:50	11	196	114.30	270
15:04:57	7	195	113.30	271
15:05:07	10	194	112.30	272
15:05:16	9	193	111.30	273
15:05:26	10	192	110.30	274
15:05:35	9	191	109.30	275
15:05:44	9	190	108.30	276
15:05:53	9	189	107.30	277
15:06:02	9	188	106.30	278
15:06:11	9	187	105.30	279
15:06:19	8	186	104.30	280
15:06:28	9	185	103.30	281
15:06:41	13	184	102.30	282
15:06:53	12	183	101.30	283
15:07:03	10	182	100.30	284
15:07:11	8	181	99.30	285
15:07:20	9	180	98.30	286
15:07:29	9	179	97.30	287
15:07:39	10	178	96.30	288
15:07:48	9	177	95.30	289
15:07:58	10	176	94.30	290
15:08:07	9	175	93.30	291
15:08:16	9	174	92.30	292
15:08:26	10	173	91.30	293
15:08:36	10	172	90.30	294
15:08:45	9	171	89.30	295
15:08:54	9	170	88.30	296
15:09:04	10	169	87.30	297
15:09:12	8	168	86.30	298
15:09:22	10	167	85.30	299
15:09:32	10	166	84.30	300
15:09:42	10	165	83.30	301
15:09:51	9	164	82.30	302
15:10:00	9	163	81.30	303
15:10:11	11	162	80.30	304
15:10:20	9	161	79.30	305
15:10:30	10	160	78.30	306
15:10:40	10	159	77.30.	307
15:10:50	10	158	76.30	308
15:10:59	9	157	75.30	309
15:11:09	10	156	74.30	310
15:11:19	10	155	73.30	311
15:11:29	10	154	72.30	312
15:11:39	10	153	71.30	313

(5)

Time	difference (seconds)	DTW	Drawdown	Water Elevation
15:11:49	10	152	70.30	314
15:12:00	11	151	69.30	315
15:12:13	13	150	68.30	316
15:12:30	17	149	67.30	317
15:12:39	9	148	66.30	318
15:12:54	15	147	65.30	319
15:13:04	10	146	64.30	320
15:13:19	15	145	63.30	321
15:13:30	11	144	62.30	322
15:13:42	12	143	61.30	323
15:13:56	14	142	60.30	324
15:14:08	12	141	59.30	325
15:14:20	12	140	58.30	326
15:14:32	12	139	57.30	327
15:14:45	13	138	56.30	328
15:15:04	19	137	55.30	329
15:15:17	13	136	54.30	330
15:15:34	17	135	53.30	331
15:16:03	29	134	52.30	332
15:16:33	30	133	51.30	333
15:16:59	26	132	50.30	334
15:17:11	12	131	49.30	335
15:17:38	27	130	48.30	336
15:18:05	27	129	47.30	337
15:18:31	26	128	46.30	338
15:18:53	22	127	45.30	339
15:19:10	17	126	44.30	340
15:19:20	10	125	43.30	341
15:19:34	14	124	42.30	342
15:19:46	12	123	41.30	343
15:20:02	16	122	40.30	344
15:20:16	14	121	39.30	345
15:20:32	16	120	38.30	346
15:20:50	18	119	37.30	347
15:21:03	13	118	36.30	348
15:21:20	17	117	35.30	349
15:21:38	18	116	34.30	350
15:21:51	13	115	33.30	351
15:22:10	19	114	32.30	352
15:22:28	18	113	31.30	353
15:22:48	20	112	30.30	354
15:23:07	19	111	29.30	355
15:23:30	23	110	28.30	356
15:23:53	23	109	27.30	357
15:24:18	25	108	26.30	358
15:24:43	25	107	25.30	359
15:25:09	26	106	24.30	360
15:25:37	28	105	23.30	361
15:26:08	31	104	22.30	362
15:26:35	27	103	21.30	363
15:27:07	32	102	20.30	364

(6)

Time	difference (seconds)	DTW	Drawdown	Water Elevation
15:27:42	35	101	19.30	365
15:28:19	37	100	18.30	366
15:29:00	41	99	17.30	367
15:29:49	49	98	16.30	368
15:30:39	50	97	15.30	369
15:31:35	56	96	14.30	370
15:32:40	65	95	13.30	371
15:33:52	72	94	12.30	372
15:35:26	94	93	11.30	373
15:37:21	115	92	10.30	374
15:42:21	300	90.18	8.48	375.82
15:47:21	300	89	7.30	377

1

Constant Rate Test at Hanamaulu Well #3
Date Started: October 26, 1998

Time	6" Meter Reading	Calculate Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
6:30:00	5696800		83.45	0	382.55
8:40:00	Remarks: Start Pump				
8:45:00	5697800	7.41	126.39	42.94	339.61
8:50:00	5698600	160.00	129.98	46.53	336.02
8:55:00	5699300	140.00	133.70	50.25	332.30
9:00:00	5700100	160.00	134.94	51.49	331.06
9:05:00	5700800	140.00	138.26	54.81	327.74
9:10:00	5701600	160.00	141.43	57.98	324.57
9:15:00	5702300	140.00	143.57	60.12	322.43
9:20:00	5703000	140.00	145.96	62.51	320.04
9:25:00	5703800	160.00	148.45	65	317.55
9:30:00	5704500	140.00	150.12	66.67	315.88
9:35:00	5705300	160.00	151.38	67.93	314.62
9:40:00	5706000	140.00	152.98	69.53	313.02
9:45:00	5706800	160.00	154.35	70.90	311.65
9:50:00	5707500	140.00	155.62	72.17	310.38
9:55:00	5708300	160.00	156.82	73.37	309.18
10:00:00	5709000	140.00	157.73	74.28	308.27
10:10:00	5710500	150.00	158.92	75.47	307.08
10:20:00	5712000	150.00	159.98	76.53	306.02
10:30:00	5713400	140.00	160.73	77.28	305.27
10:40:00	5714900	150.00	161.21	77.76	304.79
10:50:00	5716400	150.00	162.13	78.68	303.87
11:00:00	5717800	140.00	163.36	79.91	302.64
11:20:00	5720800	150.00	164.94	81.49	301.06
11:40:00	5723800	150.00	165.56	82.11	300.44
12:00:00	5726700	145.00	166.14	82.69	299.86
13:00:00	5735600	148.33	167.88	84.43	298.12
14:00:00	5744500	148.33	169.88	86.43	296.12
15:00:00	5753400	148.33	170.81	87.36	295.19
15:00:00	5753400	148.33	170.81	87.36	295.19
16:00:00	5762200	146.67	170.51	87.06	295.49
17:00:00	5771100	148.33	170.82	87.37	295.18
18:00:00	5779800	145	170.87	87.42	295.13
19:00:00	5788500	145	170.45	87.00	295.55
20:00:00	5797300	146.67	169.97	86.52	296.03
21:00:00	5806000	145	170.18	86.73	295.82
22:00:00	5814700	145	170.00	86.55	296.00
Remarks: Adjusted rate (open)					
23:00:00	5823500	146.67	175.82	92.37	290.18
10/27/98					
0:00:00	5832500	150	178.07	94.62	287.93
1:00:00	5841400	148.33	178.72	95.27	287.28
2:00:00	5850300	148.33	179.27	95.82	286.73
3:00:00	5859200	148.33	179.72	96.27	286.28

(2)

Time	6" Meter Reading	Calculate Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
4:00:00	5868100	148.33	179.99	96.54	286.01
5:00:00	5877000	148.33	180.44	96.99	285.56
6:00:00	5885900	148.33	181.65	98.20	284.35
7:00:00	5894800	148.33	180.99	97.54	285.01
8:00:00	5903700	148.33	182.24	98.79	283.76
Remarks: Adjusted rate (open)					
9:00:00	5912600	148.33	183.82	100.37	282.18
10:00:00	5921500	148.33	182.49	99.04	283.51
11:00:00	5930400	148.33	183.17	99.72	282.83
12:00:00	5939300	148.33	183.80	100.35	282.20
13:00:00	5948200	148.33	183.22	99.77	282.78
14:00:00	5957000	146.67	182.89	99.44	283.11
15:00:00	5965900	148.33	183.40	99.95	282.60
16:00:00	5974700	146.67	183.33	99.88	282.67
17:00:00	5983600	148.33	183.28	99.83	282.72
18:00:00	5992400	146.67	183.46	100.01	282.54
19:00:00	6001300	148.33	183.30	99.85	282.70
20:00:00	6010100	146.67	183.69	100.24	282.31
21:00:00	6019000	148.33	186.50	103.05	279.50
Remarks: Adjusted rate (open)					
22:00:00	6028000	150	189.77	106.32	276.23
23:00:00	6036900	148.33	190.44	106.99	275.56
10/28/98					
0:00:00	6045800	148.33	191.15	107.70	274.85
1:00:00	6054700	148.33	191.21	107.76	274.79
2:00:00	6063600	148.33	191.37	107.92	274.63
3:00:00	6072500	148.33	191.02	107.57	274.98
4:00:00	6081300	146.67	189.94	106.49	276.06
5:00:00	6090200	148.33	191.79	108.34	274.21
Remarks: Adjusted rate (open)					
6:00:00	6099100	148.33	192.52	109.07	273.48
7:00:00	6108000	148.33	192.52	109.07	273.48
8:00:00	6116800	146.67	193.22	109.77	272.78
9:00:00	6125700	148.33	192.83	109.38	273.17
10:00:00	6134600	148.33	193.22	109.77	272.78
11:00:00	6143500	148.33	193.32	109.87	272.68
12:00:00	6152300	146.67	192.56	109.11	273.44
Remarks: 12:30 - Adjusted engine speed (increased rate)					
13:00:00	6161200	148.33	196.16	112.71	269.84
14:00:00	6170200	150	197.11	113.66	268.89
15:00:00	6179100	148.33	196.54	113.09	269.46
16:00:00	6187900	146.67	195.67	112.22	270.33
17:00:00	6196800	148.33	195.79	112.34	270.21
18:00:00	6205700	148.33	196.10	112.65	269.90
19:00:00	6214500	146.67	196.02	112.57	269.98
20:00:00	6223300	146.67	194.03	110.58	271.97
21:00:00	6232100	146.67	193.43	109.98	272.57
22:00:00	6240900	146.67	193.07	109.62	272.93

3

Time	6" Meter Reading	Calculate Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
23:00:00	6249700	146.67	193.03	109.58	272.97
Remarks: Adjusted rate (open)					
10/29/98					
0:00:00	6258600	148.33	195.89	112.44	270.11
1:00:00	6267500	148.33	196.57	113.12	269.43
2:00:00	6276400	148.33	196.38	112.93	269.62
3:00:00	6285200	146.67	197.48	114.03	268.52
4:00:00	6294000	146.67	197.68	114.23	268.32
Remarks: Adjusted rate (open)					
5:00:00	6302900	148.33	198.88	115.43	267.12
6:00:00	6311800	148.33	199.68	116.23	266.32
7:00:00	6320700	148.33	200.16	116.71	265.84
8:00:00	6329500	146.67	199.09	115.64	266.91
9:00:00	6338300	146.67	198.70	115.25	267.30
10:00:00	6347200	148.33	199.03	115.58	266.97
10:00:00	6347200	148.33	199.03	115.58	266.97
11:00:00	6356000	146.67	198.53	115.08	267.47
Remarks: Adjusted rate (open)					
12:00:00	6364900	148.33	200.54	117.09	265.46
13:00:00	6373800	148.33	202.07	118.62	263.93
14:00:00	6382700	148.33	202.60	119.15	263.40
15:00:00	6391500	146.67	202.07	118.62	263.93
16:00:00	6400300	146.67	201.37	117.92	264.63
17:00:00	6409100	146.67	200.97	117.52	265.03
18:00:00	6418000	148.33	200.86	117.41	265.14
19:00:00	6426800	146.67	200.35	116.90	265.65
20:00:00	6436200	156.67	215.66	132.21	250.34
Remarks: Changed pump motor - increased rpm.					
21:00:00	6445000	146.67	214.54	131.09	251.46
22:00:00	6454100	151.67	216.20	132.75	249.80
23:00:00	6463100	150	218.43	134.98	247.57
10/30/98					
0:00:00	6472100	150	219.10	135.65	246.90
1:00:00	6481000	148.33	218.93	135.48	247.07
2:00:00	6489900	148.33	219.01	135.56	246.99
3:00:00	6498700	146.67	217.90	134.45	248.10
4:00:00	6507600	148.33	217.22	133.77	248.78
5:00:00	6516500	148.33	217.08	133.63	248.92
6:00:00	6525300	146.67	216.70	133.25	249.30
7:00:00	6534100	146.67	215.41	131.96	250.59
8:00:00	6543000	148.33	215.12	131.67	250.88
9:00:00	6551800	146.67	214.57	131.12	251.43
10:00:00	6560700	148.33	213.95	130.50	252.05
11:00:00	6569500	146.67	213.40	129.95	252.60
12:00:00	6578250	145.83	212.78	129.33	253.22
13:00:00	6587100	147.50	213.16	129.71	252.84

4

Time	6" Meter Reading	Calculate Rate (gpm)	DTW (feet)	Drawdown (feet)	Water Level Elevation
14:00:00	6596100	150	215.25	131.80	250.75
14:02:25	Remarks:	Shut-down			

RECOVERY - October 30, 1998

Time	DTW (feet)	Drawdown (feet)	Water Level Elevation
14:02:25	Pump Shut-down		
14:05:00	178.12	94.67	287.88
14:10:00	152.29	68.84	313.71
14:15:00	134.86	51.41	331.14
14:20:00	123.01	39.56	342.99
14:25:00	109.84	26.39	356.16
14:30:00	102.52	19.07	363.48
14:35:00	98.45	15	367.55
14:40:00	96.45	13	369.55
14:45:00	95.19	11.74	370.81
14:50:00	94.38	10.93	371.62
14:55:00	93.67	10.22	372.33
15:00:00	93.16	9.71	372.84
15:05:00	92.82	9.37	373.18
11/ 2/98			
6:30:00	83.77	.32	382.23

5

USGS Monitor Well (N.E. Kilohana)
Date Conducted: October 26, 1998

Time	Reading (feet)
6:30:00	87.93
8:45:00	89.98
8:50:00	90.82
8:55:00	91.27
9:00:00	91.85
9:10:00	92.24
9:15:00	92.56
9:20:00	92.88
9:25:00	93.12
9:30:00	93.33
9:35:00	93.53
9:40:00	93.71
9:45:00	93.88
9:50:00	94.03
9:55:00	94.18
10:00:00	94.31
10:10:00	94.58
10:20:00	94.71
10:30:00	94.95
10:40:00	95.11
10:50:00	95.27
11:00:00	95.40
11:20:00	95.69
11:40:00	95.92
12:00:00	96.11
13:00:00	96.58
14:00:00	96.96
15:00:00	97.30
16:00:00	97.61
17:00:00	97.81
18:00:00	97.83
19:00:00	98.18
20:00:00	98.30
21:00:00	98.47
22:00:00	98.68
23:00:00	98.83
10/27/98	
0:00:00	99.04
1:00:00	99.14
2:00:00	99.23
3:00:00	99.34
4:00:00	99.44
5:00:00	99.53
6:00:00	99.60
7:00:00	99.69
8:00:00	99.77
9:00:00	99.87
10:00:00	99.93
11:00:00	100.00
12:00:00	100.05
13:00:00	100.08
14:00:00	100.11
15:00:00	100.18
16:00:00	100.20
17:00:00	100.21
18:00:00	100.32
19:00:00	100.40
20:00:00	100.45
21:00:00	100.47
22:00:00	100.53
23:00:00	100.57
10/28/98	
0:00:00	100.61
1:00:00	100.66
2:00:00	100.70
3:00:00	100.71
4:00:00	100.72
5:00:00	100.77
6:00:00	100.79
7:00:00	100.84
8:00:00	100.87
9:00:00	100.91
10:00:00	100.92
11:00:00	100.95
12:00:00	100.96
13:00:00	100.96
14:00:00	100.99
15:00:00	101.00
16:00:00	101.03
17:00:00	101.03
18:00:00	101.04
19:00:00	101.04
20:00:00	101.05
21:00:00	101.07
22:00:00	101.12
23:00:00	101.15
10/29/98	
0:00:00	101.18
1:00:00	101.19
2:00:00	101.19

6

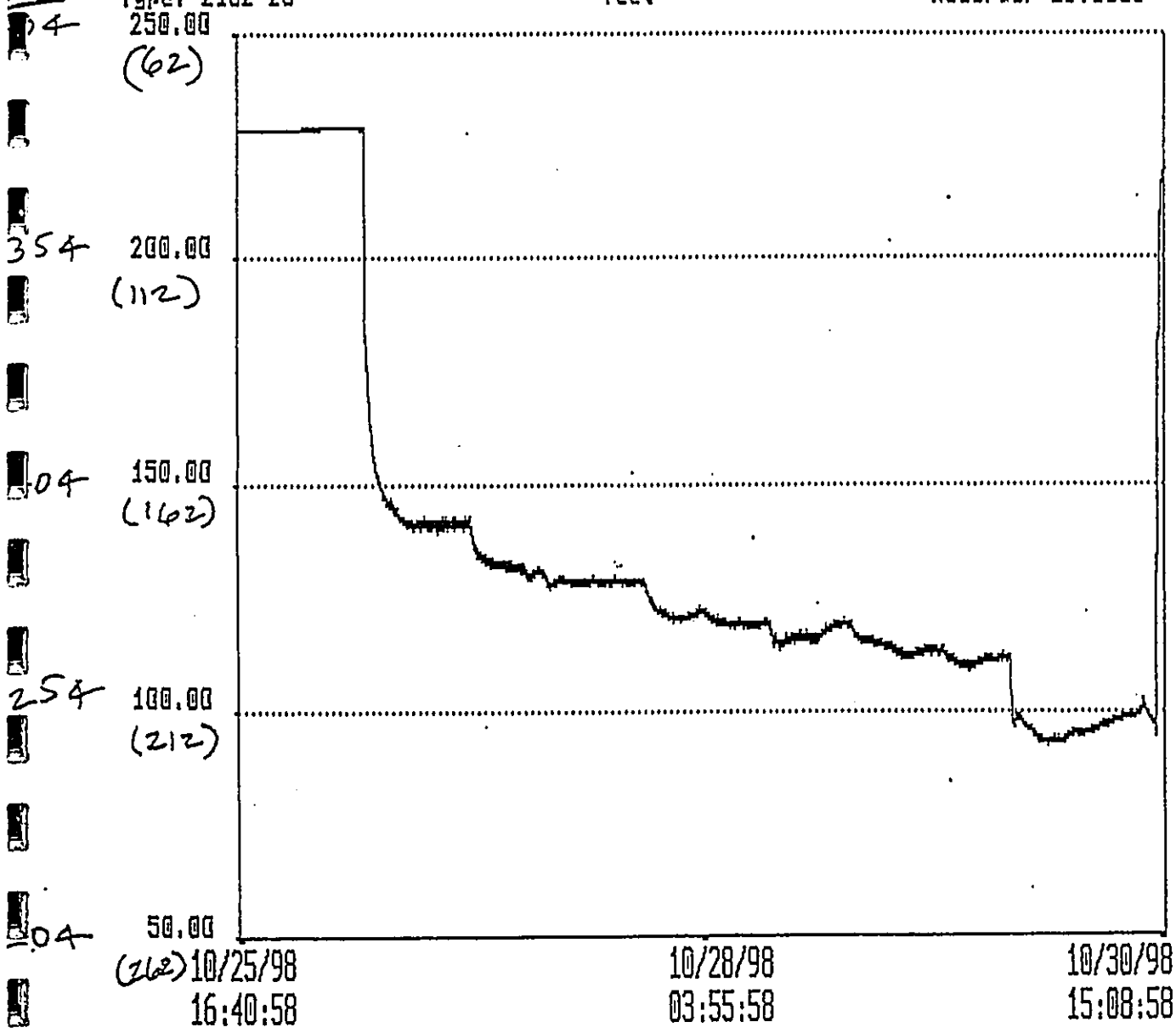
Time	Reading (feet)
3:00:00	101.20
4:00:00	101.22
5:00:00	101.24
6:00:00	101.26
7:00:00	101.28
8:00:00	101.32
9:00:00	101.34
10:00:00	101.35
11:00:00	101.36
12:00:00	101.36
13:00:00	101.37
14:00:00	101.37
15:00:00	101.37
16:00:00	101.38
17:00:00	101.38
18:00:00	101.40
19:00:00	101.40
20:00:00	101.47
21:00:00	101.48
22:00:00	101.51
23:00:00	101.53
10/30/98	
0:00:00	101.53
1:00:00	101.53
2:00:00	101.53
3:00:00	101.53
4:00:00	101.53
5:00:00	101.54
6:00:00	101.56
7:00:00	101.60
8:00:00	101.60
9:00:00	101.62
10:00:00	101.62
11:00:00	101.62
12:00:00	101.61
13:00:00	101.60
14:00:00	101.59
RECOVERY - October 30, 1998	
14:02:25	Pump Shut-down
14:05:00	101.58
14:10:00	101.34
14:15:00	100.76
14:20:00	100.07
14:25:00	99.29
14:30:00	98.52
14:35:00	97.83

Time	Reading (feet)
14:40:00	97.32
14:45:00	96.90
14:50:00	96.59
14:55:00	96.34
15:00:00	96.11
11/ 2/98	
6:30:00	88.14

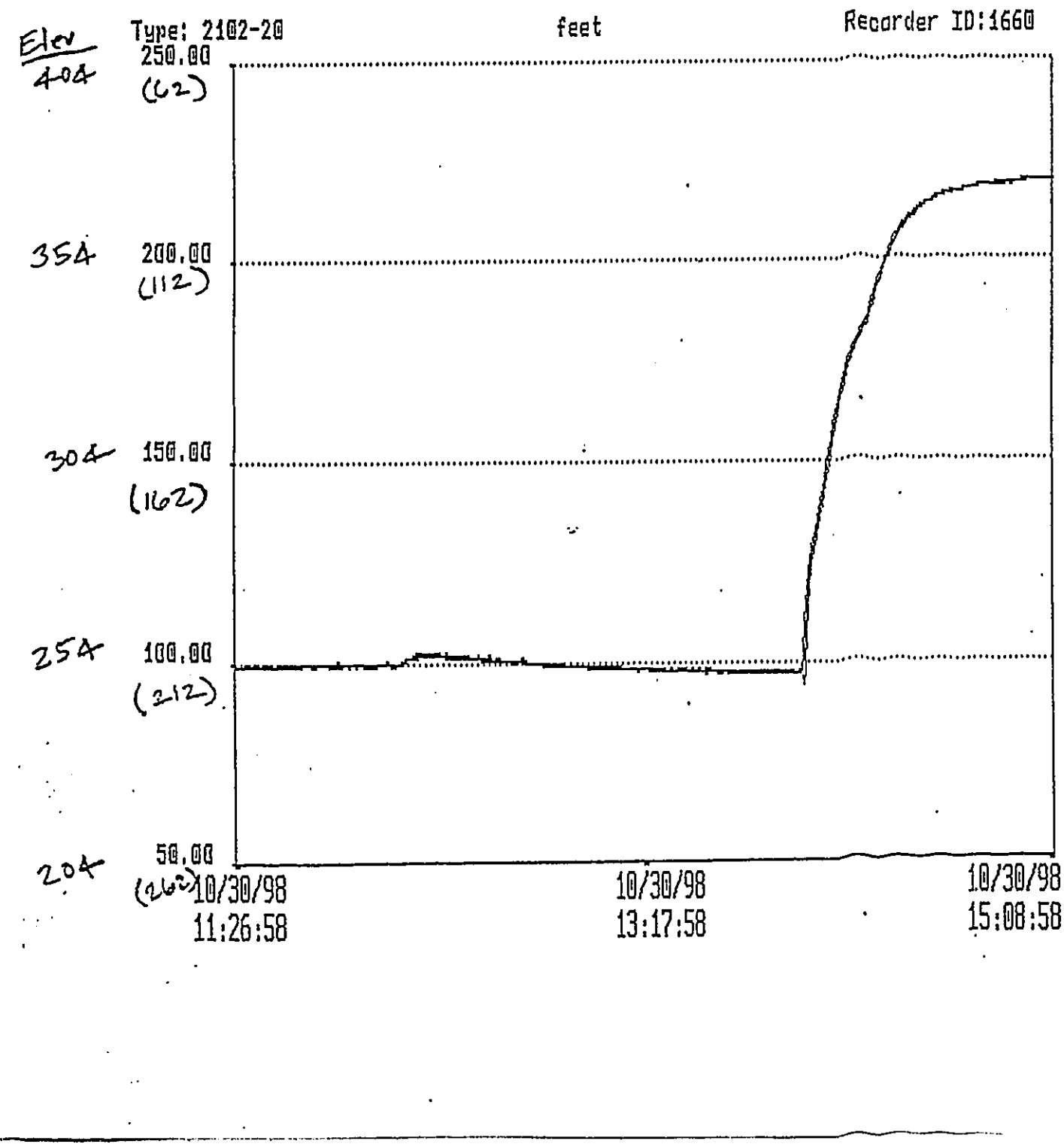
7

Elev

Type: 2102-20 feet Recorder ID:1660



8


Elev
404
Type: 2102-20
feet
Recorder ID:1660
250.00
(62)
354
200.00
(112)
304
150.00
(162)
254
100.00
(212)
204
50.00
(262)
10/30/98
11:26:58
10/30/98
13:17:58
10/30/98
15:08:58

APPENDIX B:

WATER QUALITY ANALYSES

WATER QUALITY ANALYSES

Pukaki Well

MONTGOMERY WATSON LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 568 LABS (1 800 556 5227)

Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

Report#: 45378
PHASEV

MONTGOMERY WATSON LABORATORIES

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

Report
Comments
#45378

Group Comments

(Endothall) Matrix Spike recovery is greater than acceptable limit. The LCS is within acceptance criteria and data was reported. GG 08/07/98.
TCDD was anlayzed by Quanterra Environmental Sercvices. GG 08/09/98.
(515.1) LCS recoveries fail low for acifluorfen, high for DCPA. Acifluorfen is not a regulated compound, method defines as qualitative only. Sample is ND for DCPA. QIR-GC-98-115.

(980723082)
NO2-N
Analyzed past holding time. See QIR.

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Report
Comments
#45378

Group Comments

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(980723082)
NO2-N
Analyzed past holding time. See QIR.

Report Summary of positive results, PR45378

Analyzed	980723082 PUKAKI	Result	MDL	UNITS
07/29/98	Data Entry	07/30/98		--
07/31/98	Chromium, Total, ICAP/MS	7.4	5.000	UGL
07/31/98	Data Entry	08/05/98		--
07/31/98	Methylene chloride	13.6	.500	UGL
07/29/98	Diethylphthalate	0.7	.500	UGL
07/23/98	Nitrate as NO3 by IC	1.0	.440	MGL
07/23/98	Nitrate-N by IC	0.23	.100	MGL
07/30/98	Data Entry	07/31/98		--
07/31/98	Data Entry	08/04/98		--
07/31/98	Alkalinity	110	2.000	MGL
08/05/98	Calcium, Total, ICAP	15	1.000	MGL
07/27/98	Fluoride	0.11	.100	MGL
07/25/98	Lab pH	8.1	.001	UNIT
07/31/98	Mercury	0.3	.500	UGL
07/28/98	Specific Conductance	285	4.000	UMHO

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Laboratory Report #45378

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
23-jul-1998 14:36:48

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
KAKI (980723082)	Sampled on 07/22/98							
	07/31/98	81769	(ML/S2320B)	Alkalinity	110	mg/l	2.0	1
08/05/98	08/05/98	81814	(EPA/ML 200.7)	Calcium, Total, ICAP	15	mg/l	1.0	1
	07/28/98	81365	(ML/SM 4500CN)	Cyanide	ND	mg/l	0.025	1
	07/28/98	81291	(ML/S2510B)	Specific Conductance	285	umho/cm	4.0	1
07/27/98	08/03/98	81908	(ML/EPA 548.1)	Endothall	ND	ug/l	5.0	1
	07/27/98	81211	(ML/SM 4500F)	Fluoride	0.11	mg/l	0.10	1
	07/30/98	81536	(ML/EPA 547)	Glyphosate	ND	ug/l	6.0	1
07/31/98	07/31/98	81627	(EPA/ML 245.1)	Mercury	0.3	ug/l	0.50	1
	07/24/98	81374	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
	07/25/98	81103	(ML/SM 4500H)	Lab pH	8.1	Units	0.0010	1
07/31/98	08/03/98		(EPA 1613)	2,3,7,8 - TCDD	ND	PGL	1.5	1
			525 Semivolatiles by GC/MS					
07/27/98	07/29/98	81458	(ML/EPA 525.2)	2,4-Dinitrotoluene	ND	ug/l	0.10	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	alpha-Chlordane	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Acenaphthylene	ND	ug/l	0.10	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Alachlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Aldrin	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Anthracene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Atrazine	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Benz(a)Anthracene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Benzo(a)pyrene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Benzo(b)Fluoranthene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Benzo(g,h,i)Perylene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Benzo(k)Fluoranthene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Di(2-Ethylhexyl)phthalate	ND	ug/l	0.60	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Butylbenzylphthalate	ND	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Bromacil	ND	ug/l	2.0	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Butachlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Caffeine	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Chrysene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Dibenz(a,h)Anthracene	ND	ug/l	0.050	1

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Laboratory
Report
#45378

Kauai Water Department (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Di-(2-Ethylhexyl)adipate	ND	ug/l	0.60	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Diethylphthalate	0.7	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Dieldrin	ND	ug/l	0.20	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Dimethylphthalate	ND	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Dimethoate	ND	ug/l	10	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Di-n-Butylphthalate	ND	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Endrin	ND	ug/l	0.10	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Fluorene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	gamma-Chlordane	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Hexachlorobenzene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Hexachlorocyclopentadiene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Heptachlor	ND	ug/l	0.040	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Heptachlor Epoxide	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Indeno(1,2,3,c,d)Pyrene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Isophorone	ND	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Lindane	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Methoxychlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Metribuzin	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Molinate	ND	ug/l	0.20	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Metolachlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	trans-Nonachlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Pentachlorophenol	ND	ug/l	1.0	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Phenanthrene	ND	ug/l	0.020	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Prometryn	ND	ug/l	0.50	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Propachlor	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Pyrene	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Simazine	ND	ug/l	0.050	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Thiobencarb	ND	ug/l	0.20	1
07/27/98	07/29/98	81458	(ML/EPA 525.2)	Trifluralin	ND	ug/l	0.10	1
			(Surrogate)	Perylene-d12	93	% Rec		

Aldicarbs

	07/28/98	81419	(ML/EPA 531.1)	3-Hydroxycarbofuran	ND	ug/l	2.0	1
	07/28/98	81419	(ML/EPA 531.1)	Aldicarb (Temik)	ND	ug/l	0.50	1
	07/28/98	81419	(ML/EPA 531.1)	Aldicarb sulfone	ND	ug/l	0.80	1
	07/28/98	81419	(ML/EPA 531.1)	Aldicarb sulfoxide	ND	ug/l	0.50	1

MONTGOMERY WATSON LABORATORIES
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Laboratory Report #45378

Kauai Water Department (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	07/28/98	81419	(ML/EPA 531.1)	Baygon	ND	ug/l	2.0	1
	07/28/98	81419	(ML/EPA 531.1)	Carbofuran (Furadan)	ND	ug/l	0.90	1
	07/28/98	81419	(ML/EPA 531.1)	Carbaryl	ND	ug/l	2.0	1
	07/28/98	81419	(ML/EPA 531.1)	Methiocarb	ND	ug/l	2.0	1
	07/28/98	81419	(ML/EPA 531.1)	Methomyl	ND	ug/l	1.0	1
	07/28/98	81419	(ML/EPA 531.1)	Oxamyl (Vydate)	ND	ug/l	2.0	1
			(Surrogate)	BDMC	90	% Rec		
Diquat and Paraquat								
25/98	07/27/98	81363	(ML/EPA 549.1)	Diquat	ND	ug/l	0.40	1
25/98	07/27/98	81363	(EPA 549.1)	Paraquat	ND	ug/l	2.0	1
EDB and DBCP by GC-ECD								
28/98	07/29/98	81457	(ML/EPA 504.1)	Dibromochloropropane (DBCP)	ND	ug/l	0.010	1
7/28/98	07/29/98	81457	(ML/EPA 504.1)	Ethylene Dibromide (EDB)	ND	ug/l	0.010	1
			(Surrogate)	1,2-dibromopropane	96	% Rec		
Herbicides by 515.1								
7/24/98	07/30/98	81517	(ML/EPA 515.1)	2,4,5-T	ND	ug/l	0.20	1
24/98	07/30/98	81517	(ML/EPA 515.1)	2,4,5-TP (Silvex)	ND	ug/l	0.20	1
24/98	07/30/98	81517	(ML/EPA 515.1)	2,4-D	ND	ug/l	0.10	1
7/24/98	07/30/98	81517	(ML/EPA 515.1)	2,4-DB	ND	ug/l	2.0	1
24/98	07/30/98	81517	(ML/EPA 515.1)	Dichlorprop	ND	ug/l	0.50	1
24/98	07/30/98	81517	(ML/EPA 515.1)	Acifluorfen (qualitative)	ND	ug/l	0.20	1
7/24/98	07/30/98	81517	(ML/EPA 515.1)	Bentazon	ND	ug/l	0.50	1
7/24/98	07/30/98	81517	(ML/EPA 515.1)	Dalapon (qualitative)	ND	ug/l	1.0	1
24/98	07/30/98	81517	(ML/EPA 515.1)	3,5-Dichlorobenzoic acid	ND	ug/l	0.60	1
24/98	07/30/98	81517	(ML/EPA 515.1)	DCPA	ND	ug/l	0.20	1
7/24/98	07/30/98	81517	(ML/EPA 515.1)	Dicamba	ND	ug/l	0.080	1
24/98	07/30/98	81517	(ML/EPA 515.1)	Dinoseb	ND	ug/l	0.20	1
24/98	07/30/98	81517	(ML/EPA 515.1)	Pentachlorophenol	ND	ug/l	0.040	1
7/24/98	07/30/98	81517	(ML/EPA 515.1)	Picloram	ND	ug/l	0.10	1
24/98	07/30/98	81517	(ML/EPA 515.1)	4-Nitrophenol (qualitative)	ND	ug/l	5.0	1
			(Surrogate)	2,4-Dichlorophenylacetic acid	106	% Rec		

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Kauai Water Department (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
				ICPMS Metals				
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Arsenic, Total, ICAP/MS	ND	ug/l	5.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Barium, Total, ICAP/MS	ND	ug/l	10	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Beryllium, Total, ICAP/MS	ND	ug/l	1.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Cadmium, Total, ICAP/MS	ND	ug/l	0.50	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Chromium, Total, ICAP/MS	7.4	ug/l	5.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Copper, Total, ICAP/MS	ND	ug/l	50	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Nickel, Total, ICAP/MS	ND	ug/l	5.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Lead, Total, ICAP/MS	ND	ug/l	5.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Antimony, Total, ICAP/MS	ND	ug/l	2.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Selenium, Total, ICAP/MS	ND	ug/l	5.0	1
07/31/98	07/31/98	81637	(EPA/ML 200.8)	Thallium, Total, ICAP/MS	ND	ug/l	1.0	1
				Nitrate by IC as NO3 & N				
	07/23/98	81259	(ML/EPA 300.0)	Nitrate-N by IC	0.23	mg/l	0.10	1
	07/23/98	81259	(ML/EPA 300.0)	Nitrate as NO3 by IC	1.0	mg/l	0.44	1
				SDWA Pesticides				
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1016 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1221 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1232 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1242 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1248 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1254 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	PCB 1260 Aroclor	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Alpha-BHC	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Alachlor (Alanex)	ND	ug/l	0.050	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Aldrin	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Beta-BHC	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Chlordane	ND	ug/l	0.10	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Chlorthalonil (Draconil,Bravo)	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Delta-BHC	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	p,p' DDD	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	p,p' DDE	ND	ug/l	0.010	1

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Kauai Water Department (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
07/28/98	07/31/98	81697	(ML/EPA 508)	p,p' DDT	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Dieldrin	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Endrin Aldehyde	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Endrin	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Endosulfan I (alpha)	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Endosulfan II (beta)	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Endosulfan sulfate	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Heptachlor	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Heptachlor Epoxide	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Lindane (gamma-BHC)	ND	ug/l	0.010	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Methoxychlor	ND	ug/l	0.050	1
07/28/98	07/31/98	81697	(ML/EPA 508)	Toxaphene	ND	ug/l	0.50	1
			(Surrogate)	Dibutyl Chlorendate	116	% Rec		
			(Surrogate)	Tetrachlorometaxylene	116	% Rec		

Volatile Organic Compounds

07/31/98	81765	(ML/EPA 502.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1-Dichloroethene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2-Dichlorobenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,3-Dichlorobenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	1,4-Dichlorobenzene	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
07/31/98	81765	(ML/EPA 502.2)	2-Chlorotoluene	ND	ug/l	0.50	1

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	07/31/98	81765	(ML/EPA 502.2)	4-Chlorotoluene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Bromodichloromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Benzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Bromobenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Bromochloromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Bromomethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	cis-1,2-Dichloroethene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Chlorobenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Carbon tetrachloride	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Bromoform	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Chloroform	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Chloroethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Chloromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Dibromochloromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	1,2-Dibromo-3-chloropropane	ND	ug/l	1.0	1
	07/31/98	81765	(ML/EPA 502.2)	Dibromomethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	1,2-Dibromoethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Ethylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Isopropylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Methylene chloride	13.6	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	m+p-Xylenes	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Methyl tert-butyl ether	ND	ug/l	5.0	1
	07/31/98	81765	(ML/EPA 502.2)	Naphthalene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	n-Butylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	n-Propylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	o-Xylene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Styrene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	trans-1,2-Dichloroethene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	07/31/98	81765	(ML/EPA 502.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Toluene	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Trichlorofluoromethane	ND	ug/l	0.50	1
	07/31/98	81765	(ML/EPA 502.2)	Vinyl chloride	ND	ug/l	0.30	1
			(Surrogate)	Bromofluorobenzene-ELCD	85	% Rec		
			(Surrogate)	Bromofluorobenzene-PID	90	% Rec		
			(Surrogate)	Chlorofluorobenzene-ELCD	93	% Rec		
			(Surrogate)	Chlorofluorobenzene-PID	93	% Rec		

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QC Batch #81103

Lab pH

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	lab # 98	0724111		(0.00 - 0.00)	

QC Batch #81211

Fluoride

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0722066		(0.00 - 0.00)	
LCS1	Fluoride	0.87	0.86	98.9	(90.00 - 110.00)	
LCS2	Fluoride	0.87	0.86	98.9	(90.00 - 110.00)	0.00
MBLK	Fluoride	ND				
MS	Fluoride	0.909	1.02	112.2	(80.00 - 120.00)	
MSD	Fluoride	0.909	1.02	112.2	(80.00 - 120.00)	0.00

QC Batch #81259

Nitrate by IC as NO3 & N

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0722074		(0.00 - 0.00)	
LCS1	Nitrate-N	2.5	2.6	104.0	(90.00 - 110.00)	
LCS2	Nitrate-N	2.5	2.6	104.0	(90.00 - 110.00)	0.00
MS	Nitrate-N	2.5	2.0	80.0	(75.00 - 125.00)	
MSD	Nitrate-N	2.5	2.0	80.0	(75.00 - 125.00)	0.00
MBLK	Nitrate as NO3 by IC	ND				

QC Batch #81291

Specific Conductance

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	Lab # 98	0722195		(0.00 - 0.00)	

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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QC Batch #81363

Diquat and Paraquat

QC	Analyte
MS	Spiked sample
LCS1	Diquat
MBLK	Diquat
MS	Diquat
LCS1	Paraquat
MBLK	Paraquat
MS	Paraquat

Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
Lab # 98	0723052		(0.00 - 0.00)	
10.0	9.64	96.4	(70.00 - 130.00)	
ND				
10.0	8.66	86.6	(70.00 - 130.00)	
10.0	10.7	107.0	(70.00 - 130.00)	
ND				
10.0	9.49	94.9	(70.00 - 130.00)	

QC Batch #81365

Cyanide

QC	Analyte
MS	Spiked sample
LCS1	Cyanide
MBLK	Cyanide
MS	Cyanide
MSD	Cyanide

Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
Lab # 98	0723082		(0.00 - 0.00)	
0.10	0.094	94.0	(90.00 - 110.00)	
ND				
0.096	0.088	91.7	(80.00 - 120.00)	
0.096	0.090	93.8	(80.00 - 120.00)	2.2

QC Batch #81374

Nitrite, Nitrogen by IC

QC	Analyte
MS	Spiked sample
LCS1	Nitrite, Nitrogen by IC
LCS2	Nitrite, Nitrogen by IC
MBLK	Nitrite, Nitrogen by IC
MS	Nitrite, Nitrogen by IC
MSD	Nitrite, Nitrogen by IC

Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
Lab # 98	0724107		(0.00 - 0.00)	
1.0	0.98	98.0	(90.00 - 110.00)	
1.0	0.97	97.0	(90.00 - 110.00)	1.0
ND				
1.0	1.04	104.0	(80.00 - 120.00)	
1.0	1.05	105.0	(80.00 - 120.00)	0.96

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QC Batch #81419

Aldicarbs

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	3-Hydroxycarbofuran	20.0	19.8	99.0	(80.00 - 120.00)	
MBLK	3-Hydroxycarbofuran	ND				
MS	3-Hydroxycarbofuran	20.0	20.0	100.0	(80.00 - 120.00)	
MS	Spiked sample	Lab # 98	0723082		(0.00 - 0.00)	
LCS1	Aldicarb (Temik)	20.0	18.6	93.0	(80.00 - 120.00)	
MBLK	Aldicarb (Temik)	ND				
MS	Aldicarb (Temik)	20.0	20.5	102.5	(80.00 - 120.00)	
LCS1	Aldicarb sulfone	20.0	18.6	93.0	(80.00 - 120.00)	
MBLK	Aldicarb sulfone	ND				
MS	Aldicarb sulfone	20.0	19.7	98.5	(80.00 - 120.00)	
LCS1	Aldicarb sulfoxide	20.0	19.8	99.0	(80.00 - 120.00)	
MBLK	Aldicarb sulfoxide	ND				
MS	Aldicarb sulfoxide	20.0	20.0	100.0	(80.00 - 120.00)	
LCS1	Baygon	20.0	19.7	98.5	(80.00 - 120.00)	
MBLK	Baygon	ND				
MS	Baygon	20.0	19.7	98.5	(80.00 - 120.00)	
LCS1	Carbofuran (Furadan)	20.0	19.8	99.0	(80.00 - 120.00)	
MBLK	Carbofuran (Furadan)	ND				
MS	Carbofuran (Furadan)	20.0	19.9	99.5	(80.00 - 120.00)	
LCS1	Carbaryl	20.0	19.2	96.0	(80.00 - 120.00)	
MBLK	Carbaryl	ND				
MS	Carbaryl	20.0	20.0	100.0	(80.00 - 120.00)	
LCS1	Methiocarb	20.0	19.2	96.0	(80.00 - 120.00)	
MBLK	Methiocarb	ND				
MS	Methiocarb	20.0	19.4	97.0	(80.00 - 120.00)	
LCS1	Methomyl	20.0	19.2	96.0	(80.00 - 120.00)	
MBLK	Methomyl	ND				
MS	Methomyl	20.0	19.8	99.0	(80.00 - 120.00)	
LCS1	Oxamyl (Vydate)	20.0	19.2	96.0	(80.00 - 120.00)	
MBLK	Oxamyl (Vydate)	ND				
MS	Oxamyl (Vydate)	20.0	19.8	99.0	(80.00 - 120.00)	

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QC Batch #81457 EDB and DBCP by GC-ECD

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	Lab # 98	0723275		(0.00 - 0.00)	
MS	Spiked sample	Lab # 98	0723274		(0.00 - 0.00)	
DUP	Dibromochloropropane (DBCP)	0.11	0.11		(0.00 - 20.00)	0.0
LCS1	Dibromochloropropane (DBCP)	0.10	0.11	110.0	(60.00 - 140.00)	
LCS2	Dibromochloropropane (DBCP)	0.10	0.10	100.0	(60.00 - 140.00)	9.5
MBLK	Dibromochloropropane (DBCP)	ND				
MS	Dibromochloropropane (DBCP)	0.10	0.09	90.0	(60.00 - 140.00)	
DUP	Ethylene Dibromide (EDB)	0.26	0.26		(0.00 - 20.00)	0.0
LCS1	Ethylene Dibromide (EDB)	0.10	0.10	100.0	(60.00 - 140.00)	
LCS2	Ethylene Dibromide (EDB)	0.10	0.09	90.0	(60.00 - 140.00)	11
MBLK	Ethylene Dibromide (EDB)	ND				
MS	Ethylene Dibromide (EDB)	0.10	0.10	100.0	(60.00 - 140.00)	
DUP	1,2-dibromopropane (surr)	100	101		(60.00 - 140.00)	101.0
LCS1	1,2-dibromopropane (surr)	100	101	101.0	(60.00 - 140.00)	
LCS2	1,2-dibromopropane (surr)	100	90	90.0	(60.00 - 140.00)	12
MBLK	1,2-dibromopropane (surr)	100	100	100.0		
MS	1,2-dibromopropane (surr)	100	90	90.0	(60.00 - 140.00)	

QC Batch #81458 525 Semivolatiles by GC/MS

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	alpha-Chlordane	2	2.21	110.5	(70.00 - 130.00)	
MBLK	alpha-Chlordane	ND				
MS	alpha-Chlordane	2	2.06	103.0	(70.00 - 130.00)	
MBLK	Diazinon	ND				
MS	Spiked sample	Lab # 98	0722204		(0.00 - 0.00)	
LCS1	Acenaphthylene	2	1.87	93.5	(70.00 - 130.00)	
MBLK	Acenaphthylene	ND				
MS	Acenaphthylene	2	1.68	84.0	(70.00 - 130.00)	
LCS1	Alachlor	2	2.14	107.0	(70.00 - 130.00)	
MBLK	Alachlor	ND				

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MS	Alachlor	2	2.14	107.0	(70.00 - 130.00)
LCS1	Aldrin	2	2.05	102.5	(70.00 - 130.00)
MBLK	Aldrin	ND			
MS	Aldrin	2	1.99	99.5	(70.00 - 130.00)
LCS1	Anthracene	2	2.03	101.5	(70.00 - 130.00)
MBLK	Anthracene	ND			
MS	Anthracene	2	1.85	92.5	(70.00 - 130.00)
LCS1	Atrazine	2	2.08	104.0	(70.00 - 130.00)
MBLK	Atrazine	ND			
MS	Atrazine	2	2.19	109.5	(70.00 - 130.00)
LCS1	Benz(a)Anthracene	2	1.90	95.0	(70.00 - 130.00)
MBLK	Benz(a)Anthracene	ND			
MS	Benz(a)Anthracene	2	1.87	93.5	(70.00 - 130.00)
LCS1	Benzo(a)pyrene	2	1.99	99.5	(70.00 - 130.00)
MBLK	Benzo(a)pyrene	ND			
MS	Benzo(a)pyrene	2	1.75	87.5	(70.00 - 130.00)
LCS1	Benzo(b)Fluoranthene	2	2.16	108.0	(70.00 - 130.00)
MBLK	Benzo(b)Fluoranthene	ND			
MS	Benzo(b)Fluoranthene	2	2.01	100.5	(70.00 - 130.00)
LCS1	Benzo(g,h,i)Perylene	2	1.97	98.5	(70.00 - 130.00)
MBLK	Benzo(g,h,i)Perylene	ND			
MS	Benzo(g,h,i)Perylene	2	1.75	87.5	(70.00 - 130.00)
LCS1	Benzo(k)Fluoranthene	2	2.03	101.5	(70.00 - 130.00)
MBLK	Benzo(k)Fluoranthene	ND			
MS	Benzo(k)Fluoranthene	2	1.96	98.0	(70.00 - 130.00)
LCS1	Di(2-Ethylhexyl)phthalate	2	2.18	109.0	(70.00 - 130.00)
MBLK	Di(2-Ethylhexyl)phthalate	ND			
MS	Di(2-Ethylhexyl)phthalate	2	2.46	123.0	(70.00 - 130.00)
LCS1	Butylbenzylphthalate	2	1.90	95.0	(70.00 - 130.00)
MBLK	Butylbenzylphthalate	ND			
MS	Butylbenzylphthalate	2	2.17	108.5	(70.00 - 130.00)
MBLK	Bromacil	ND			
MBLK	Butachlor	ND			
LCS1	Caffeine	2	2.19	109.5	(70.00 - 130.00)
MBLK	Caffeine	ND			
MS	Caffeine	2	1.90	95.0	(70.00 - 130.00)
LCS1	Chrysene	2	2.08	104.0	(70.00 - 130.00)

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MBLK	Chrysene	ND			
MS	Chrysene	2	2.06	103.0	(70.00 - 130.00)
LCS1	Dibenz(a,h)Anthracene	2	2.10	105.0	(70.00 - 130.00)
MBLK	Dibenz(a,h)Anthracene	ND			
MS	Dibenz(a,h)Anthracene	2	1.82	91.0	(70.00 - 130.00)
LCS1	Di-(2-Ethylhexyl)adipate	2	2.16	108.0	(70.00 - 130.00)
MBLK	Di-(2-Ethylhexyl)adipate	ND			
MS	Di-(2-Ethylhexyl)adipate	2	2.03	101.5	(70.00 - 130.00)
LCS1	Diethylphthalate	2	2.10	105.0	(70.00 - 130.00)
MBLK	Diethylphthalate	ND			
MS	Diethylphthalate	2	2.21	110.5	(70.00 - 130.00)
MBLK	Dieldrin	ND			
LCS1	Dimethylphthalate	2	2.22	111.0	(70.00 - 130.00)
MBLK	Dimethylphthalate	ND			
MS	Dimethylphthalate	2	2.16	108.0	(70.00 - 130.00)
MBLK	Dimethoate	ND			
LCS1	Di-n-Butylphthalate	2	2.27	113.5	(70.00 - 130.00)
MBLK	Di-n-Butylphthalate	ND			
MS	Di-n-Butylphthalate	2	1.54	77.0	(70.00 - 130.00)
LCS1	Endrin	2	2.04	102.0	(70.00 - 130.00)
MBLK	Endrin	ND			
MS	Endrin	2	2.11	105.5	(70.00 - 130.00)
LCS1	Fluorene	2	2.21	110.5	(70.00 - 130.00)
MBLK	Fluorene	ND			
MS	Fluorene	2	2.09	104.5	(70.00 - 130.00)
LCS1	gamma-Chlordane	2	2.17	108.5	(70.00 - 130.00)
MBLK	gamma-Chlordane	ND			
MS	gamma-Chlordane	2	2.09	104.5	(70.00 - 130.00)
LCS1	Hexachlorobenzene	2	2.04	102.0	(70.00 - 130.00)
MBLK	Hexachlorobenzene	ND			
MS	Hexachlorobenzene	2	1.93	96.5	(70.00 - 130.00)
LCS1	Hexachlorocyclopentadiene	2	2.08	104.0	(70.00 - 130.00)
MBLK	Hexachlorocyclopentadiene	ND			
MS	Hexachlorocyclopentadiene	2	1.72	86.0	(70.00 - 130.00)
LCS1	Heptachlor	2	2.05	102.5	(70.00 - 130.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	2	2.08	104.0	(70.00 - 130.00)

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LCS1	Heptachlor Epoxide	2	2.12	106.0	(70.00 - 130.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	2	2.14	107.0	(70.00 - 130.00)
LCS1	Indeno(1,2,3,c,d) Pyrene	2	2.02	101.0	(70.00 - 130.00)
MBLK	Indeno(1,2,3,c,d) Pyrene	ND			
MS	Indeno(1,2,3,c,d) Pyrene	2	1.88	94.0	(70.00 - 130.00)
MBLK	Isophorone	ND			
LCS1	Lindane	2	1.96	98.0	(70.00 - 130.00)
MBLK	Lindane	ND			
MS	Lindane	2	2.01	100.5	(70.00 - 130.00)
LCS1	Methoxychlor	2	2.04	102.0	(70.00 - 130.00)
MBLK	Methoxychlor	ND			
MS	Methoxychlor	2	2.22	111.0	(70.00 - 130.00)
MBLK	Metribuzin	ND			
LCS1	Molinate	2	2.19	109.5	(70.00 - 130.00)
MBLK	Molinate	ND			
MS	Molinate	2	2.19	109.5	(70.00 - 130.00)
MBLK	Metolachlor	ND			
LCS1	trans-Nonachlor	2	2.08	104.0	(70.00 - 130.00)
MBLK	trans-Nonachlor	ND			
MS	trans-Nonachlor	2	2.19	109.5	(70.00 - 130.00)
LCS1	Pentachlorophenol	8	7.72	96.5	(70.00 - 130.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	8	10.3	128.8	(70.00 - 130.00)
LCS1	Phenanthrene	2	2.02	101.0	(70.00 - 130.00)
MBLK	Phenanthrene	ND			
MS	Phenanthrene	2	1.94	97.0	(70.00 - 130.00)
MBLK	Prometryn	ND			
MBLK	Propachlor	ND			
LCS1	Pyrene	2	2.09	104.5	(70.00 - 130.00)
MBLK	Pyrene	ND			
MS	Pyrene	2	2.16	108.0	(70.00 - 130.00)
LCS1	Simazine	2	2.27	113.5	(70.00 - 130.00)
MBLK	Simazine	ND			
MS	Simazine	2	2.15	107.5	(70.00 - 130.00)
LCS1	Thiobencarb	2	2.04	102.0	(70.00 - 130.00)
MBLK	Thiobencarb	ND			

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MS	Thiobencarb	2	2.07	103.5	(70.00 - 130.00)	
MBLK	Trifluralin	ND				

QC Batch #81517 Herbicides by 515.1

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	2,4,5-T	0.50	0.56	112.0	(68.00 - 166.00)	
MBLK	2,4,5-T	ND				
MS	2,4,5-T	0.50	0.55	110.0	(68.00 - 166.00)	
LCS1	2,4,5-TP (Silvex)	0.50	0.54	108.0	(42.00 - 226.00)	
MBLK	2,4,5-TP (Silvex)	ND				
MS	2,4,5-TP (Silvex)	0.50	0.55	110.0	(42.00 - 226.00)	
LCS1	2,4-D	1.00	1.1	110.0	(49.00 - 214.00)	
MBLK	2,4-D	ND				
MS	2,4-D	1.00	1.1	110.0	(49.00 - 214.00)	
LCS1	2,4-DB	4.00	3.1	77.5	(48.00 - 126.00)	
MBLK	2,4-DB	ND				
MS	2,4-DB	4.00	4.5	112.5	(48.00 - 126.00)	
LCS1	Dichlorprop	1.50	1.6	106.7	(46.00 - 168.00)	
MBLK	Dichlorprop	ND				
MS	Dichlorprop	1.50	1.6	106.7	(46.00 - 168.00)	
MS	Spiked sample	Lab # 98	0723048		(0.00 - 0.00)	
LCS1	Acifluorfen (qualitative)	0.50	0.26	52.0	(74.00 - 168.00)	
MBLK	Acifluorfen (qualitative)	ND				
MS	Acifluorfen (qualitative)	0.50	0.43	86.0	(74.00 - 168.00)	
LCS1	Bentazon	1.00	1.1	110.0	(70.00 - 170.00)	
MBLK	Bentazon	ND				
MS	Bentazon	1.00	1.2	120.0	(70.00 - 170.00)	
LCS1	Dalapon (qualitative)	6.50	6.0	92.3	(40.00 - 160.00)	
MBLK	Dalapon (qualitative)	ND				
MS	Dalapon (qualitative)	6.50	5.6	86.2	(40.00 - 160.00)	
LCS1	3,5-Dichlorobenzoic acid	0.50	0.51	102.0	(53.00 - 151.00)	
MBLK	3,5-Dichlorobenzoic acid	ND				
MS	3,5-Dichlorobenzoic acid	0.50	0.53	106.0	(53.00 - 151.00)	
LCS1	DCPA	0.50	0.58	116.0	(44.00 - 104.00)	
MBLK	DCPA	ND				

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MS	DCPA	0.50	0.59	118.0	(44.00 - 104.00)
LCS1	Dicamba	0.50	0.50	100.0	(38.00 - 232.00)
MBLK	Dicamba	ND			
MS	Dicamba	0.50	0.51	102.0	(38.00 - 232.00)
LCS1	Dinoseb	1.00	0.63	63.0	(0.00 - 85.00)
MBLK	Dinoseb	ND			
MS	Dinoseb	1.00	0.70	70.0	(0.00 - 85.00)
LCS1	Pentachlorophenol	0.50	0.46	92.0	(36.00 - 224.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	0.50	0.53	106.0	(36.00 - 224.00)
LCS1	Picloram	0.50	0.47	94.0	(45.00 - 138.00)
MBLK	Picloram	ND			
MS	Picloram	0.50	0.51	102.0	(45.00 - 138.00)
LCS1	4-Nitrophenol (qualitative)	0.50	0.52	104.0	(60.00 - 202.00)
MBLK	4-Nitrophenol (qualitative)	ND			
MS	4-Nitrophenol (qualitative)	0.50	0.56	112.0	(71.00 - 202.00)
LCS1	2,4-Dichlorophenylacetic acid	100	106	106.0	(70.00 - 130.00)
MBLK	2,4-Dichlorophenylacetic acid	100	107	107.0	
MS	2,4-Dichlorophenylacetic acid	100	107	107.0	(70.00 - 130.00)

QC Batch #81536 Glyphosate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0722002		(0.00 - 0.00)	
LCS1	Glyphosate	50	52.2	104.4	(70.00 - 130.00)	
MBLK	Glyphosate	ND				
MS	Glyphosate	50	49.3	98.6	(70.00 - 130.00)	

QC Batch #81627 Mercury

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	80723263		(0.00 - 0.00)	
LCS1	Mercury	1.56	1.68	107.7	(85.00 - 115.00)	
LCS2	Mercury	1.56	1.50	96.2	(85.00 - 115.00)	11
MBLK	Mercury	ND				

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MS	Mercury	1.56	1.76	112.8	(80.00 - 120.00)	
MSD	Mercury	1.56	1.73	110.9	(80.00 - 120.00)	1.7

QC Batch #81637 ICPMS Metals

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Arsenic, Total, ICAP/MS	20	19.5	97.5	(85.00 - 115.00)	
MBLK	Arsenic, Total, ICAP/MS	ND				
LCS1	Barium, Total, ICAP/MS	100	99.7	99.7	(85.00 - 115.00)	
MBLK	Barium, Total, ICAP/MS	ND				
LCS1	Beryllium, Total, ICAP/MS	5	4.73	94.6	(85.00 - 115.00)	
MBLK	Beryllium, Total, ICAP/MS	ND				
LCS1	Cadmium, Total, ICAP/MS	20	19.6	98.0	(85.00 - 115.00)	
MBLK	Cadmium, Total, ICAP/MS	ND				
LCS1	Chromium, Total, ICAP/MS	100	94.7	94.7	(85.00 - 115.00)	
MBLK	Chromium, Total, ICAP/MS	ND				
LCS1	Copper, Total, ICAP/MS	100	102	102.0	(85.00 - 115.00)	
MBLK	Copper, Total, ICAP/MS	ND				
LCS1	Nickel, Total, ICAP/MS	50	48.8	97.6	(85.00 - 115.00)	
MBLK	Nickel, Total, ICAP/MS	ND				
LCS1	Lead, Total, ICAP/MS	20	19.1	95.5	(85.00 - 115.00)	
MBLK	Lead, Total, ICAP/MS	ND				
LCS1	Antimony, Total, ICAP/MS	50	46.5	93.0	(85.00 - 115.00)	
MBLK	Antimony, Total, ICAP/MS	ND				
LCS1	Selenium, Total, ICAP/MS	20	20.3	101.5	(85.00 - 115.00)	
MBLK	Selenium, Total, ICAP/MS	ND				
LCS1	Thallium, Total, ICAP/MS	20	18.9	94.5	(85.00 - 115.00)	
MBLK	Thallium, Total, ICAP/MS	ND				

QC Batch #81697 SDWA Pesticides

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	PCB 1016 Aroclor	ND				
MBLK	PCB 1221 Aroclor	ND				
MBLK	PCB 1232 Aroclor	ND				

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LCS1	PCB 1242 Aroclor	*0.500*	*0.509*	101.8	(70.00 - 130.00)
MBLK	PCB 1242 Aroclor	ND			
MBLK	PCB 1248 Aroclor	ND			
MBLK	PCB 1254 Aroclor	ND			
MBLK	PCB 1260 Aroclor	ND			
LCS1	Alpha-BHC	0.050	0.054	108.0	(62.00 - 122.00)
MBLK	Alpha-BHC	ND			
MS	Alpha-BHC	0.050	0.056	112.0	(62.00 - 122.00)
MS	Spiked sample	Lab # 98	0722206		(0.00 - 0.00)
MBLK	Alachlor (Alanex)	ND			
LCS1	Alachlor (Alanex)	0.100	0.105	105.0	(70.00 - 130.00)
MS	Alachlor (Alanex)	0.100	0.102	102.0	(70.00 - 130.00)
LCS1	Aldrin	0.050	0.045	90.0	(56.00 - 116.00)
MBLK	Aldrin	ND			
MS	Aldrin	0.050	0.051	102.0	(56.00 - 116.00)
LCS1	Beta-BHC	0.050	0.052	104.0	(65.00 - 125.00)
MBLK	Beta-BHC	ND			
MS	Beta-BHC	0.050	0.051	102.0	(65.00 - 125.00)
MBLK	Chlordane	ND			
LCS1	Chlorthalonil (Draconil,Bravo)	0.100	0.103	103.0	(61.00 - 121.00)
MBLK	Chlorthalonil (Draconil,Bravo)	ND			
MS	Chlorthalonil (Draconil,Bravo)	0.100	0.104	104.0	(61.00 - 121.00)
LCS1	Delta-BHC	0.050	0.054	108.0	(68.00 - 136.00)
MBLK	Delta-BHC	ND			
MS	Delta-BHC	0.050	0.058	116.0	(68.00 - 136.00)
LCS1	p,p' DDD	0.100	0.106	106.0	(77.00 - 137.00)
MBLK	p,p' DDD	ND			
MS	p,p' DDD	0.100	0.107	107.0	(77.00 - 137.00)
LCS1	p,p' DDE	0.100	0.111	111.0	(63.00 - 135.00)
MBLK	p,p' DDE	ND			
MS	p,p' DDE	0.100	0.112	112.0	(77.00 - 137.00)
LCS1	p,p' DDT	0.100	0.109	109.0	(62.00 - 162.00)
MBLK	p,p' DDT	ND			
MS	p,p' DDT	0.100	0.117	117.0	(62.00 - 162.00)
LCS1	Dieldrin	0.100	0.110	110.0	(57.00 - 117.00)
MBLK	Dieldrin	ND			
MS	Dieldrin	0.100	0.110	110.0	(57.00 - 117.00)

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LCS1	Endrin Aldehyde	0.100	0.094	94.0	(58.00 - 118.00)
MBLK	Endrin Aldehyde	ND			
MS	Endrin Aldehyde	0.100	0.085	85.0	(58.00 - 118.00)
LCS1	Endrin	0.100	0.108	108.0	(58.00 - 118.00)
MBLK	Endrin	ND			
MS	Endrin	0.100	0.112	112.0	(58.00 - 118.00)
LCS1	Endosulfan I (alpha)	0.050	0.052	104.0	(57.00 - 117.00)
MBLK	Endosulfan I (alpha)	ND			
MS	Endosulfan I (alpha)	0.050	0.053	106.0	(62.00 - 122.00)
LCS1	Endosulfan II (beta)	0.100	0.105	105.0	(62.00 - 122.00)
MBLK	Endosulfan II (beta)	ND			
MS	Endosulfan II (beta)	0.100	0.104	104.0	(62.00 - 122.00)
LCS1	Endosulfan sulfate	0.100	0.116	116.0	(56.00 - 148.00)
MBLK	Endosulfan sulfate	ND			
MS	Endosulfan sulfate	0.100	0.115	115.0	(56.00 - 148.00)
LCS1	Gamma-BHC (Lindane)	0.050	0.056	112.0	(59.00 - 119.00)
MBLK	Gamma-BHC (Lindane)	ND			
MS	Gamma-BHC (Lindane)	0.050	0.062	124.0	(59.00 - 119.00)
LCS1	Heptachlor	0.050	0.050	100.0	(63.00 - 133.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	0.050	0.058	116.0	(63.00 - 133.00)
LCS1	Heptachlor Epoxide	0.050	0.056	112.0	(57.00 - 117.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	0.050	0.056	112.0	(57.00 - 117.00)
LCS1	Methoxychlor	0.500	0.616	123.2	(64.00 - 146.00)
MBLK	Methoxychlor	ND			
MS	Methoxychlor	0.500	0.614	122.8	(64.00 - 146.00)
LCS1	Tetrachlorometaxylene (surr)	100	103	103.0	(70.00 - 130.00)
MBLK	Tetrachlorometaxylene (surr)	100	108	108.0	
MS	Tetrachlorometaxylene (surr)	100	114	114.0	(70.00 - 130.00)
LCS1	Dibutyl chlorendate (surr)	100	124	124.0	(70.00 - 130.00)
MBLK	Dibutyl chlorendate (surr)	100	120	120.0	
MS	Dibutyl chlorendate (surr)	100	120	120.0	(70.00 - 130.00)
MBLK	Toxaphene	ND			

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QC Batch #81765

Volatile Organic Compounds

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	1,1,1,2-Tetrachloroethane	4.00	4.56	114.0	(80.00 - 120.00)	
MBLK	1,1,1,2-Tetrachloroethane	ND				
LCS1	1,1,1-Trichloroethane	4.00	4.79	119.8	(80.00 - 120.00)	
MBLK	1,1,1-Trichloroethane	ND				
LCS1	1,1,2,2-Tetrachloroethane	4.00	4.39	109.7	(80.00 - 120.00)	
MBLK	1,1,2,2-Tetrachloroethane	ND				
LCS1	1,1,2-Trichloroethane	4.00	4.36	109.0	(80.00 - 120.00)	
MBLK	1,1,2-Trichloroethane	ND				
LCS1	1,1-Dichloroethane	4.00	4.57	114.2	(80.00 - 120.00)	
MBLK	1,1-Dichloroethane	ND				
LCS1	1,1-Dichloroethene	4.00	4.60	115.0	(80.00 - 120.00)	
MBLK	1,1-Dichloroethene	ND				
LCS1	1,1-Dichloropropene	4.00	4.62	115.5	(80.00 - 120.00)	
MBLK	1,1-Dichloropropene	ND				
LCS1	1,2,3-Trichloropropane	4.00	4.54	113.5	(80.00 - 120.00)	
MBLK	1,2,3-Trichloropropane	ND				
LCS1	1,2,3-Trichlorobenzene	4.00	3.90	97.5	(80.00 - 120.00)	
MBLK	1,2,3-Trichlorobenzene	ND				
LCS1	1,2,4-Trichlorobenzene	4.00	3.82	95.5	(80.00 - 120.00)	
MBLK	1,2,4-Trichlorobenzene	ND				
LCS1	1,2,4-Trimethylbenzene	4.00	4.36	109.0	(80.00 - 120.00)	
MBLK	1,2,4-Trimethylbenzene	ND				
LCS1	1,2-Dichloroethane	4.00	4.66	116.5	(80.00 - 120.00)	
MBLK	1,2-Dichloroethane	ND				
LCS1	1,2-Dichlorobenzene	4.00	4.23	105.8	(80.00 - 120.00)	
MBLK	1,2-Dichlorobenzene	ND				
LCS1	1,2-Dichloropropane	4.00	4.56	114.0	(80.00 - 120.00)	
MBLK	1,2-Dichloropropane	ND				
LCS1	1,3,5-Trimethylbenzene	4.00	4.50	112.5	(80.00 - 120.00)	
MBLK	1,3,5-Trimethylbenzene	ND				
LCS1	1,3-Dichlorobenzene	4.00	4.24	106.0	(80.00 - 120.00)	
MBLK	1,3-Dichlorobenzene	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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Pasadena, California 91101
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Laboratory
QC Report
#45378

Kauai Water Department
(continued)

LCS1	1,3-Dichloropropane	4.00	4.26	106.5	(80.00 - 120.00)
MBLK	1,3-Dichloropropane	ND			
LCS1	1,4-Dichlorobenzene	4.00	4.20	105.0	(80.00 - 120.00)
MBLK	1,4-Dichlorobenzene	ND			
LCS1	2,2-Dichloropropane	8.00	8.72	109.0	(80.00 - 120.00)
MBLK	2,2-Dichloropropane	ND			
LCS1	2-Chlorotoluene	4.00	4.39	109.7	(80.00 - 120.00)
MBLK	2-Chlorotoluene	ND			
LCS1	4-Chlorotoluene	4.00	4.30	107.5	(80.00 - 120.00)
MBLK	4-Chlorotoluene	ND			
LCS1	Bromodichloromethane	4.00	4.43	110.8	(80.00 - 120.00)
MBLK	Bromodichloromethane	ND			
LCS1	Benzene	4.00	4.40	110.0	(80.00 - 120.00)
MBLK	Benzene	ND			
LCS1	Bromobenzene	4.00	4.25	106.2	(80.00 - 120.00)
MBLK	Bromobenzene	ND			
LCS1	Bromochloromethane	4.00	4.40	110.0	(80.00 - 120.00)
MBLK	Bromochloromethane	ND			
LCS1	Bromomethane	2.00	2.28	114.0	(80.00 - 120.00)
MBLK	Bromomethane	ND			
LCS1	cis-1,2-Dichloroethene	4.00	4.43	110.8	(80.00 - 120.00)
MBLK	cis-1,2-Dichloroethene	ND			
LCS1	Chlorobenzene	4.00	4.46	111.5	(80.00 - 120.00)
MBLK	Chlorobenzene	ND			
LCS1	Carbon tetrachloride	4.00	4.75	118.8	(80.00 - 120.00)
MBLK	Carbon tetrachloride	ND			
LCS1	cis-1,3-Dichloropropene	4.00	4.47	111.8	(80.00 - 120.00)
MBLK	cis-1,3-Dichloropropene	ND			
LCS1	Bromoform	4.00	4.41	110.2	(80.00 - 120.00)
MBLK	Bromoform	ND			
LCS1	Chloroform	4.00	4.67	116.8	(80.00 - 120.00)
MBLK	Chloroform	ND			
LCS1	Chloroethane	2.00	2.23	111.5	(80.00 - 120.00)
MBLK	Chloroethane	ND			
LCS1	Chloromethane	2.00	2.38	119.0	(80.00 - 120.00)
MBLK	Chloromethane	ND			
LCS1	Dibromochloromethane	4.00	4.47	111.8	(80.00 - 120.00)

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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Laboratory
QC Report
#45378

Kauai Water Department
(continued)

MBLK	Dibromochloromethane	ND			
LCS1	1,2-Dibromo-3-chloropropane	4.00	4.39	109.7	(80.00 - 120.00)
LCS1	Dibromomethane	4.00	4.52	113.0	(80.00 - 120.00)
MBLK	Dibromomethane	ND			
LCS1	Dichlorodifluoromethane	2.00	2.15	107.5	(80.00 - 120.00)
MBLK	Dichlorodifluoromethane	ND			
LCS1	1,2-Dibromoethane	4.00	4.27	106.7	(80.00 - 120.00)
LCS1	Ethylbenzene	4.00	4.46	111.5	(80.00 - 120.00)
MBLK	Ethylbenzene	ND			
LCS1	Hexachlorobutadiene	4.00	4.34	108.5	(80.00 - 120.00)
MBLK	Hexachlorobutadiene	ND			
LCS1	Isopropylbenzene	4.00	4.51	112.8	(80.00 - 120.00)
MBLK	Isopropylbenzene	ND			
LCS1	Methylene chloride	4.00	4.45	111.2	(80.00 - 120.00)
MBLK	Methylene chloride	ND			
LCS1	m+p-Xylenes	8.00	8.35	104.4	(80.00 - 120.00)
MBLK	m+p-Xylenes	ND			
LCS1	Methyl tert-butyl ether	40.0	39.3	98.2	(80.00 - 120.00)
MBLK	Methyl tert-butyl ether	ND			
LCS1	Naphthalene	4.00	3.92	98.0	(80.00 - 120.00)
MBLK	Naphthalene	ND			
LCS1	n-Butylbenzene	4.00	4.32	108.0	(80.00 - 120.00)
MBLK	n-Butylbenzene	ND			
LCS1	n-Propylbenzene	4.00	4.54	113.5	(80.00 - 120.00)
MBLK	n-Propylbenzene	ND			
LCS1	o-Xylene	4.00	4.36	109.0	(80.00 - 120.00)
MBLK	o-Xylene	ND			
LCS1	Tetrachloroethylene (PCE)	4.00	4.70	117.5	(80.00 - 120.00)
MBLK	Tetrachloroethylene (PCE)	ND			
LCS1	p-Isopropyltoluene	4.00	4.42	110.5	(80.00 - 120.00)
MBLK	p-Isopropyltoluene	ND			
LCS1	sec-Butylbenzene	4.00	4.51	112.8	(80.00 - 120.00)
MBLK	sec-Butylbenzene	ND			
LCS1	Styrene	4.00	4.35	108.7	(80.00 - 120.00)
MBLK	Styrene	ND			
LCS1	Chlorofluorobenzene (surr) PID	100	106	106.0	(80.00 - 120.00)
MBLK	Chlorofluorobenzene (surr) PID	100	94	94.0	

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Laboratory
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Kauai Water Department
(continued)

LCS1	Bromofluorobenzene (surr) PID	100	108	108.0	(80.00 - 120.00)
MBLK	Bromofluorobenzene (surr) PID	100	89	89.0	
LCS1	Chlorofluorobenzene (surr) ELC	100	110	110.0	(80.00 - 120.00)
MBLK	Chlorofluorobenzene (surr) ELC	100	90	90.0	
LCS1	Bromofluorobenzene (surr) ELCD	100	103	103.0	(80.00 - 120.00)
MBLK	Bromofluorobenzene (surr) ELCD	100	89	89.0	
LCS1	trans-1,2-Dichloroethene	4.00	4.52	113.0	(80.00 - 120.00)
MBLK	trans-1,2-Dichloroethene	ND			
LCS1	tert-Butylbenzene	4.00	4.50	112.5	(80.00 - 120.00)
MBLK	tert-Butylbenzene	ND			
LCS1	Trichloroethylene (TCE)	4.00	4.68	117.0	(80.00 - 120.00)
MBLK	Trichloroethylene (TCE)	ND			
MBLK	Trichlorotrifluoroethane(Freon	ND			
LCS1	Trichlorotrifluoroethane(Freon	2.00	2.34	117.0	(80.00 - 120.00)
LCS1	trans-1,3-Dichloropropene	4.00	4.45	111.2	(80.00 - 120.00)
MBLK	trans-1,3-Dichloropropene	ND			
LCS1	Toluene	4.00	4.41	110.2	(80.00 - 120.00)
MBLK	Toluene	ND			
LCS1	Trichlorofluoromethane	2.00	2.10	105.0	(80.00 - 120.00)
MBLK	Trichlorofluoromethane	ND			
LCS1	Vinyl chloride	2.00	2.25	112.5	(80.00 - 120.00)
MBLK	Vinyl chloride	ND			

QC Batch #81769 Alkalinity

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0723082		(0.00 - 0.00)	
LCS1	Alkalinity	96.2	95.6	99.4	(90.00 - 110.00)	
LCS2	Alkalinity	96.2	95.8	99.6	(90.00 - 110.00)	0.21
MBLK	Alkalinity	ND				
MS	Alkalinity	96.2	89.0	92.5	(80.00 - 120.00)	
MSD	Alkalinity	96.2	90.0	93.6	(80.00 - 120.00)	1.1

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Laboratory
QC Report
#45378

Kauai Water Department
(continued)

QC Batch #81814 — Calcium, Total, ICAP

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0723262		(0.00 - 0.00)	
LCS1	Calcium, Total, ICAP	50	50.4	100.8	(90.00 - 110.00)	
LCS2	Calcium, Total, ICAP	50	50.0	100.0	(90.00 - 110.00)	0.80
MBLK	Calcium, Total, ICAP	ND				
MS	Calcium, Total, ICAP	50	47.0	94.0	(80.00 - 120.00)	
MSD	Calcium, Total, ICAP	50	47.0	94.0	(80.00 - 120.00)	0.00

QC Batch #81908 — Endothall

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	0722004		(0.00 - 0.00)	
LCS1	Endothall	25	25.9	103.6	(80.00 - 120.00)	
MBLK	Endothall	ND				
MS	Endothall	25	37.8	151.2	(80.00 - 120.00)	

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Criteria for MS and DUP are not applicable for ICR monitoring.

MONTGOMERY WATSON LABORATORIES
555 E. Walnut Street Pasadena, CA 91101
(626) 568-6400 Fax: (626) 568-6324

Ship to: Quanterra Environmental Services
880 Riverside Parkway
W. Sacramento, CA 95605
(916) 374-4348

Bill Recipient: FEDEX ACCT: 2060-8019-1

7/24/98
Date

1846 OM
Blanket Purchase Order
Nannie Estrada
SUB LAB CONTACT

PO Sub#: 98- 1060

MWL GROUP # 45378
Please refer to this number on Report & Invoice

Please provide results by Fax &Mail

Attention: Martha Frost, Subcontract Administrator ext 6437

Please Use MWL Lab Number	Client Sample ID for Reference only	Sample Date	Report Needed On	Analysis Requested	Matrix	# of	Containers
980723082	PUKAKI	7/22/98	8/8/98	TCDD-DW BY 1613B	DW	2	1 L AMB GLASS

SPECIAL REQUIREMENTS: rec'd in good cond. 07-25-98

RELINQUISHED BY: MARTIN DEMESA Date: 7/24/98

RECEIVED BY: Cheryl Shipley Date: 7-25-98 1015

An Acknowledgment of Receipt is requested

98-1060

Quanterra
Environmental Services

KAUAI
45378

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605

916 373-5600 Telephone
916 372-1059 Fax

August 6, 1998
QUANTERRA INCORPORATED PROJECT NUMBER: 300604
PO/CONTRACT: SUB 98-1060/Group # 45378

Martha Frost
Montgomery Watson Laboratories
555 East Walnut Street
Pasadena, CA 91101

Dear Ms. Frost:

This report contains the analytical results for the one aqueous sample which was received under chain of custody by Quanterra Incorporated on 25 July 1998.

The case narrative is an integral part of this report.

If you have any questions, please feel free to call.

Sincerely,

Nanny Estrada

Nanny Estrada
Project Manager
Advanced Technology

NE/rr

Quanterra

TABLE OF CONTENTS

QUANTERRA INCORPORATED PROJECT NUMBER 300604

Quanterra

CASE NARRATIVE

QUANTERRA INCORPORATED PROJECT NUMBER 300604

Detection limits for dioxins are reported on a sample specific basis and all results are recovery corrected per the isotope dilution technique.

There were no anomalies associated with this report.

Quanterra

QUANTERRA INCORPORATED QUALITY CONTROL PROGRAM

Quanterra has implemented an extensive Quality Control (QC) program to ensure the production of scientifically sound, legally defensible data of known documentable quality. This QC program is based upon requirements in "Test Methods for Evaluating Solid Waste", USEPA SW-846, Third Edition. It applies whenever SW-846 analytical methods are used. It also applies in whole or in part whenever project requirements fail to specify some aspect of QC practices described here. It does not apply when other well defined QC programs (e.g. CLP or CLP-like) are specified. This is Quanterra's base QC program for environmental analysis.

Definitions:

Quality Control Batch. The quality control (QC) batch is a set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.

Surrogate. A surrogate (or internal standard) is an organic compound similar in chemical behavior to the target analyte, but not normally found in environmental samples. Surrogates (or IS) are added to all samples in a batch to monitor the effects of both the matrix and the analytical process on accuracy.

Method Blank. A method blank (MB) is a control sample prepared using the same reagents used for the samples. As part of the QC batch, it accompanies the samples through all steps of the sample extraction and cleanup procedure. The method blank is used to monitor the level of contamination introduced to a batch of samples as a result of processing in the laboratory.

Laboratory Control Sample. A laboratory control sample (LCS) is prepared using a well characterized matrix (e.g., reagent water or Ottawa sand) that is spiked with known amounts of representative analytes. Alternate matrices (e.g., glass beads) may be used for soil analyses when Ottawa sand is not appropriate. As part of a QC batch, it accompanies the samples through all steps of the sample extraction and cleanup process. The LCS is used to monitor the accuracy of the analytical process independent of possible interference effects due to sample matrix.

Duplicate Control Sample. A duplicate laboratory control sample (DCS) consists of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects.

Quanterra

SAMPLE DESCRIPTION INFORMATION
for
Montgomery Watson Laboratories

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
300604-0001-MB	Method Blank	AQUEOUS			25 JUL 98
300604-0001-SA	980723082 PUKAKI	AQUEOUS	22 JUL 98		25 JUL 98

Quanterra

2,3,7,8-TCDD
Method 1613B
HIGH RESOLUTION

Client Name: Montgomery Watson Laboratories
Client ID: Method Blank
Lab ID: 300604-0001-MB
Matrix: AQUEOUS Sampled: NA Received: NA
Authorized: 25 JUL 98 Prepared: 31 JUL 98 Analyzed: 05 AUG 98

Sample Amount 1.00 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/L	1.5	
	% Recovery			
13C-2,3,7,8-TCDD	89			

ND = Not detected
NA = Not applicable

Reported By: Teri Stone Approved By: Clark Pickell

The cover letter is an integral part of this report.
Rev 230787

Quanterra

2,3,7,8-TCDD
Method 1613B
HIGH RESOLUTION

Client Name: Montgomery Watson Laboratories
Client ID: 980723082 PUKAKI
Lab ID: 300604-0001-SA
Matrix: AQUEOUS
Authorized: 25 JUL 98

Sampled: 22 JUL 98
Prepared: 31 JUL 98

Received: 25 JUL 98
Analyzed: 03 AUG 98

Sample Amount 1.05 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/L	1.5	
	% Recovery			
13C-2,3,7,8-TCDD	104			

ND = Not detected
NA = Not applicable

Reported By: Teri Stone

Approved By: Clark Pickell

The cover letter is an integral part of this report.
Rev 230787

LABORATORY CONTROL SAMPLE REPORT
Advanced Technology Group - High Resolution
Project: 300604

Category: 1613B-DW 2,3,7,8-TCDD by Method 1613B (Drinking Water)
Test: TCDD-1613B-EPA-DW
Matrix: AQUEOUS
QC Lot: 31 JUL 98-A QC Run: 05 AUG 98-C
Concentration Units: pg/uL

Analyte	Concentration Spiked	Measured	Accuracy(%) LCS	Limits
2,3,7,8-TCDD	10.0	10.8	108	73-146
13C-2,3,7,8-TCDD	100	89.9	90	25-141

Calculations are performed before rounding to avoid round-off errors in calculated results.

Job 96-1
Drill i Test Pukaki

Date: July 22, 1998

source: Pukaki (NEW source well)

collected at 0920 on 7-22-98

samper: Cindee Saito

chlorine residual: None - non-chlorinated sampe

Received in lab at 0945 by C. Saito & refrigerated

Temp. control: 22.5°C (on arrival)

note: Water had a yellowish color

July 23, 1998

M-Endo : # coliform colonies/100mL : TNTC / sheen color

Sterility control. Begin (—)

End (—)

Positive control: (+)

116 CFU 117 CFU

July 24, 1998 Time: 0800

Inoc. date	7-23-98 LTB	7-23-98 BGB	7-23-98 (Time 0930) EC
	-+---	+----	-----
Pos. control	+	+	+
Neg. control	—	—	—

Cont'd

Cont'd Pukaki sample

Method: Heterotrophic Plate Count

1.0 mL	1.0 mL	0.1 mL	0.1 mL
TNTC	TNTC	TNTC	TNTC

control (sterility) : (–)

HPC prepared on July 22, 1998

July 21, 1998

Pukaki (Hanamaulu)

1510 7-21-98

pH: 7.84 temp. 24.8

Aug. 3, 1998

(New Source)

Pukaki Well 1145

pH : 7.73

turbidity : 0.71 NTU

conductivity : 239 µS

Hardness (total) : 104 mg/L

Hardness (Ca) : 38 mg/L

August 4, 1998

(New source

Special sample collected on 8-3-98 at 1145 from Pukaki

Filter 25ml × 4

Plate 1 : Background : TNTC 4 Atypical

Plate 2 : Background : TNTC 1 Atypical

Plate 3 : Background : TNTC

Plate 4 : Background : TNTC 4 Atypical , 1 typical

Sterility control Begin : (—)(—)(—)

End : (—)(—)(—)

Positive control : (+)

Negative control : (—) Prepared on 7-31-98

Positive on NA : (+)

~~fc~~ Negative on NA : (+)

Pukaki sample cont'd ~~24 hr reading~~ Aug. 6, 1998 @ 1100

	inoc. date: 8-5-98 LTB	8-5-98 BGB	8-5-98 EC
Plate 1 :	+⊖⊖⊖	⊖⊖⊖⊖	---- (Atypical)
Plate 2 :	⊖	⊖	— (Atypical)
Plate 4	⊖⊖⊖⊖	⊖⊖⊖⊖	(---- (Atypical) -(typical)
	+	+	

Note: With "O" 48 hr. reading

July 14, 1998

Pukaki ('Hanamaulu) 7-11-98

Time: 0809 (water is brown)

Cl⁻ —

Time: 0826

Cl⁻ : 24 ppm

Time: 0848

Cl⁻: 24 ppm

Time: 1103

Cl⁻ : 24 ppm

Time: 1250

Cl⁻ : 24 ppm

Time: 1411

Cl^- : 26 ppm

Time: 1619

Cl^- : 26 ppm

Time: 1659 (Water is a little turbid)

Cl^- : 26 ppm

July 16, 1998

Pukaki (Hanamaulu)

1. 0650 7-15-98
   Cl^- : 26 ppm

2. 0730 7-15-98
   Cl^- : 26 ppm

3. 1130 7-15-98
   Cl^- : 26 ppm

4. 1330 7-15-98
   Cl^- 26 ppm

5. 1900 7-15-98
   Cl^- 26ppm

6. Midnight 7-16-98
   Cl^- : 26ppm

7. 0600 7-16-98
   Cl^- : 26 ppm

July 24, 1998

Pukaki

1. 7-20-98 1600
   Cl⁻ : 26 ppm

2. 7-20-98 2200
   Cl⁻ : 26ppm

3. 7-21-98 1030
   Cl⁻ : 26ppm

4. 7-21-98 ~~1155~~ 0400
   Cl⁻ : 26ppm

5. 7-21-98 1630
   Cl⁻ 26ppm

6. 7-21-98 2230
   Cl⁻ : 26 ppm

7. 7-22-98 0430
   Cl⁻ 26ppm

PUKAKI contd

8. 7-22-98 1030

Cl- 20ppm

9. 7-22-98 1630

Cl- : 26ppm

10. 7-22-98 2230

Cl- : 26ppm

11. 7-23-98 0430

Cl- 20ppm

12. 7-23-98 1630

Cl- : 20 ppm

13. 7-24-98 0030 (1230 am)

Cl- : 28 ppm

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

HDS Hillary Strayer

Report#: 52081
PHASEV

eport Summary of positive results, PR52081

			Result	MDL	UNITS
ıalyzed	990223109	PUKAKI			
ıalyzed	990223110	HANAMAULU 3			
ıalyzed	990223111	TRAV BLANK-HOLD			

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Laboratory
Report
#52081

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
23-feb-1999 13:06:06

PUKAKI (990223109) Sampled on 02/18/99

Regulated VOCs plus Lists 1&3

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	ND	ug/l	5.0	1
03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	ND	ug/l	5.0	1
03/02/99	93004	(ML/EPA 524.2)	Benzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Bromoform	ND	ug/l	0.50	1
03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	ND	ug/l	0.50	1

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Laboratory Report #52081

Kauai Water Department
(continued)

epared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	ND	ug/l	0.50	1
	03/02/99	93004	(ML/E524.2/624)	Methyl Tert-butyl ether (MTBE)	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	ND	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	105	% Rec		
			(Surrogate)	4-Bromofluorobenzene	90	% Rec		

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
			(Surrogate)	Toluene-d8	98	% Rec		
HANAMAULU 3 (990223110) Sampled on 02/19/99								
				Regulated VOCs plus Lists 1&3				
	03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromoform	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	ND	ug/l	0.50	1

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Chloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	ND	ug/l	0.50	1
	03/02/99	93004	(ML/E524.2/624)	Methyl Tert-butyl ether (MTBE)	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	ND	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	110	% Rec		
			(Surrogate)	4-Bromofluorobenzene	87	% Rec		
			(Surrogate)	Toluene-d8	96	% Rec		

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Kauai Water Department
(continued)

TRAV BLANK-HOLD (990223111) Sampled on 02/18/99

Regulated VOCs plus Lists 1&3

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	NA	ug/l	5.0	1	
03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	NA	ug/l	5.0	1	
03/02/99	93004	(ML/EPA 524.2)	Benzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Bromoform	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	NA	ug/l	0.50	1	
03/02/99	93004	(ML/EPA 524.2)	Chloroethane	NA	ug/l	0.50	1	

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Kauai Water Department
(continued)

epared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	NA	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	NA	ug/l	0.50	1
	03/02/99	93004	(ML/E524.2/624)	Methyl Tert-butyl ether (MTBE)	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	NA	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	NA	% Rec		
			(Surrogate)	4-Bromofluorobenzene	NA	% Rec		
			(Surrogate)	Toluene-d8	NA	% Rec		

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Laboratory
QC Report
#52081

Kauai Water Department

QC Batch #93004

Regulated VOCs plus Lists 1&3

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	1,1,1,2-Tetrachloroethane	ND				
LCS1	1,1,1-Trichloroethane	4	3.99	99.8	(70.00 - 130.00)	
MBLK	1,1,1-Trichloroethane	ND				
LCS1	1,1,2,2-Tetrachloroethane	4	3.71	92.8	(70.00 - 130.00)	
MBLK	1,1,2,2-Tetrachloroethane	ND				
LCS1	1,1,2-Trichloroethane	4	3.81	95.2	(70.00 - 130.00)	
MBLK	1,1,2-Trichloroethane	ND				
LCS1	1,1-Dichloroethane	4	3.76	94.0	(70.00 - 130.00)	
MBLK	1,1-Dichloroethane	ND				
LCS1	1,1-Dichloroethylene	4	4.42	110.5	(70.00 - 130.00)	
MBLK	1,1-Dichloroethylene	ND				
MBLK	1,1-Dichloropropene	ND				
MBLK	1,2,3-Trichlorobenzene	ND				
MBLK	1,2,3-Trichloropropane	ND				
LCS1	1,2,4-Trichlorobenzene	4	3.87	96.8	(70.00 - 130.00)	
MBLK	1,2,4-Trichlorobenzene	ND				
MBLK	1,2,4-Trimethylbenzene	ND				
LCS1	1,2-Dichloroethane	4	3.97	99.2	(70.00 - 130.00)	
MBLK	1,2-Dichloroethane	ND				
LCS1	1,2-Dichloropropane	4	4.38	109.5	(70.00 - 130.00)	
MBLK	1,2-Dichloropropane	ND				
MBLK	1,3,5-Trimethylbenzene	ND				
LCS1	1,3-Dichloropropane	8	7.43	93.0	(70.00 - 130.00)	
MBLK	1,3-Dichloropropane	ND				
LCS1	p-Dichlorobenzene (1,4-DCB)	4	3.74	93.5	(70.00 - 130.00)	
MBLK	p-Dichlorobenzene (1,4-DCB)	ND				
MBLK	2,2-Dichloropropane	ND				
MBLK	2-Butanone (MEK)	ND				
MBLK	2-Chloroethylvinylether	ND				
MBLK	o-Chlorotoluene	ND				
MBLK	p-Chlorotoluene	ND				
MBLK	4-Methyl-2-Pentanone (MIBK)	ND				
LCS1	Benzene	4	4.22	105.5	(70.00 - 130.00)	
MBLK	Benzene	ND				
MBLK	Bromobenzene	ND				
MBLK	Bromomethane (Methyl Bromide)	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for TCR monitoring.

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Kauai Water Department
(continued)

LCS1	cis-1,2-Dichloroethylene	4	4.23	105.8	(70.00 - 130.00)
MBLK	cis-1,2-Dichloroethylene	ND			
LCS1	Chlorobenzene	4	3.91	97.8	(70.00 - 130.00)
MBLK	Chlorobenzene	ND			
LCS1	Carbon Tetrachloride	4	4.03	100.8	(70.00 - 130.00)
MBLK	Carbon Tetrachloride	ND			
MBLK	cis-1,3-Dichloropropene	ND			
LCS1	Bromoform	4	2.84	71.0	(70.00 - 130.00)
MBLK	Bromoform	ND			
LCS1	Chloroform (Trichloromethane)	4	3.96	99.0	(70.00 - 130.00)
MBLK	Chloroform (Trichloromethane)	ND			
MBLK	Bromochloromethane	ND			
MBLK	Chloroethane	ND			
MBLK	Chloromethane(Methyl Chloride)	ND			
LCS1	Chlorodibromomethane	4	3.61	90.2	(70.00 - 130.00)
MBLK	Chlorodibromomethane	ND			
MBLK	Dibromomethane	ND			
LCS1	Bromodichloromethane	4	3.71	92.8	(70.00 - 130.00)
MBLK	Bromodichloromethane	ND			
LCS1	Dichloromethane	4	4.10	102.5	(70.00 - 130.00)
MBLK	Dichloromethane	ND			
MBLK	Di-isopropyl ether	ND			
LCS1	Ethyl benzene	4	3.90	97.5	(70.00 - 130.00)
MBLK	Ethyl benzene	ND			
MBLK	Dichlorodifluoromethane	ND			
LCS1	Fluorotrichloromethane-Freon11	2	1.71	85.5	(70.00 - 130.00)
MBLK	Fluorotrichloromethane-Freon11	ND			
MBLK	Hexachlorobutadiene	ND			
MBLK	Isopropylbenzene	ND			
MBLK	m-Dichlorobenzene (1,3-DCB)	ND			
LCS1	m,p-Xylenes	8	8.03	100.4	(70.00 - 130.00)
MBLK	m,p-Xylenes	ND			
LCS1	Methyl Tert-butyl ether (MTBE)	8	8.84	110.5	(70.00 - 130.00)
MBLK	Methyl Tert-butyl ether (MTBE)	ND			
MBLK	Naphthalene	ND			
MBLK	n-Butylbenzene	ND			
MBLK	n-Propylbenzene	ND			

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Kauai Water Department
(continued)

LCS1	o-Xylene	4	3.93	98.2	(70.00 - 130.00)
MBLK	o-Xylene	ND			
LCS1	o-Dichlorobenzene (1,2-DCB)	4	3.82	95.5	(70.00 - 130.00)
MBLK	o-Dichlorobenzene (1,2-DCB)	ND			
LCS1	Tetrachloroethylene (PCE)	4	4.15	103.8	(70.00 - 130.00)
MBLK	Tetrachloroethylene (PCE)	ND			
MBLK	p-Isopropyltoluene	ND			
MBLK	sec-Butylbenzene	ND			
LCS1	Styrene	4	3.76	94.0	(70.00 - 130.00)
MBLK	Styrene	ND			
LCS1	trans-1,2-Dichloroethylene	4	4.44	111.0	(70.00 - 130.00)
MBLK	trans-1,2-Dichloroethylene	ND			
MBLK	tert-amyl Methyl Ether	ND			
MBLK	tert-Butyl Ethyl Ether	ND			
MBLK	tert-Butylbenzene	ND			
LCS1	Trichloroethylene (TCE)	4	4.04	101.0	(70.00 - 130.00)
MBLK	Trichloroethylene (TCE)	ND			
LCS1	Trichlorotrifluoroethane(Freon	2	1.79	89.5	(70.00 - 130.00)
MBLK	Trichlorotrifluoroethane(Freon	ND			
MBLK	trans-1,3-Dichloropropene	ND			
LCS1	Toluene	4	4.06	101.5	(70.00 - 130.00)
MBLK	Toluene	ND			
LCS1	Vinyl chloride (VC)	2	1.68	84.0	(70.00 - 130.00)
MBLK	Vinyl chloride (VC)	ND			

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WATER QUALITY ANALYSES

Hanamaulu Well No. 3

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Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

HDS Hillary Strayer

Report#: 48372
PHASEV

Montgomery Watson Laboratories
, Los Angeles, CA 90051-3508
PHONE: 626-568-6400/FAX: 626-568-6324

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Kauai Water Department
P.O. Box 1706
Lihue, HI 96766
Attn: Wayne Hinazumi

Customer Code: KAUAI
Group#: 48372
Project#: PHASEV
Proj Mgr: Hillary Strayer
Phone: (808) 245-5433

The following samples were received from you on 10/20/98. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Montgomery Watson Laboratories.

Sample#	Sample Id	Matrix / Tests Scheduled	Sample Date
981020033	HANAMAULU WELL 3	Water	10/19/98
		@DIQUAT @EDB-DBC @MET-HI @ML502.2 @ML525	
		@ML531 @NO3DW @NPS3 @PESTSDW ENDOTHAL TCDD	
		CNDW GLYPHOS HG CA NO2-N F	
		ALK PH EC	

Test Acronym Description

Test Acronym	Description
@DIQUAT	Diquat and Paraquat
@EDB-DBC	EDB and DBCP by GC-ECD
@MET-HI	ICPMS Metals
@ML502.2	Volatile Organic Compounds
@ML525	525 Semivolatiles by GC/MS
@ML531	Aldicarbs
@NO3DW	Nitrate by IC as NO3 & N
@NPS3	Herbicides by 515.1
@PESTSDW	SDWA Pesticides
ALK	Alkalinity
CA	Calcium, Total, ICAP
CNDW	Cyanide
EC	Specific Conductance
ENDOTHAL	Endothall
F	Fluoride
GLYPHOS	Glyphosate
HG	Mercury
NO2-N	Nitrite, Nitrogen by IC
PH	Lab pH
TCDD-DW	2,3,7,8 - TCDD

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Group Comments

(508) LCS recoveries fail low for endrin aldehyde and DDD. Neither compound is regulated. Sample results for these target analytes may be biased low. QIR-GC-98-194.
(515.1) LCS recovery fails low for acifluorfen. Not a regulated compound, method defines as qualitative only.
TCDD is analyzed by Quanterra Environmental Services. GG 11/12/98.

Report Summary of positive results, PR48372

Analyzed	981020033 HANAMAULU WELL 3	Result	MDL	UNITS
10/24/98	Data Entry	10/27/98		--
10/26/98	Chromium, Total, ICAP/MS	5.8	5.000	UGL
10/22/98	Data Entry	10/27/98		--
10/23/98	Methylene chloride	1.5	.500	UGL
11/02/98	Atrazine	0.06	.050	UGL
11/02/98	Diethylphthalate	0.6	.500	UGL
10/21/98	Nitrate as NO3 by IC	5.3	.440	MGL
10/21/98	Nitrate-N by IC	1.2	.100	MGL
10/28/98	Data Entry	10/30/98		--
10/30/98	Data Entry	11/03/98		--
10/26/98	Alkalinity	77	2.000	MGL
10/21/98	Calcium, Total, ICAP	7.09	1.000	MGL
10/21/98	Lab pH	7.0	.001	UNIT
10/21/98	Specific Conductance	225	4.000	UMHO

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Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
20-oct-1998 13:41:09

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
HANAMAULU WELL 3 (981020033) Sampled on 10/19/98								
	10/26/98	86389	(ML/S2320B)	Alkalinity	77	mg/l	2.0	1
10/21/98	10/21/98	86117	(EPA/ML 200.7)	Calcium, Total, ICAP	7.09	mg/l	1.0	1
	10/27/98	86438	(ML/SM 4500CN)	Cyanide	ND	mg/l	0.025	1
	10/21/98	86095	(ML/S2510B)	Specific Conductance	225	umho/cm	4.0	1
10/26/98	11/04/98	86756	(ML/EPA 548.1)	Endothall	ND	ug/l	5.0	1
	10/30/98	86628	(ML/SM 4500F)	Fluoride	ND	mg/l	0.10	1
	10/26/98	86377	(ML/EPA 547)	Glyphosate	ND	ug/l	6.0	1
10/30/98	10/30/98	86658	(EPA/ML 245.1)	Mercury	ND	ug/l	0.50	1
	10/21/98	86384	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
	10/21/98	86098	(ML/SM 4500H)	Lab pH	7.0	Units	0.0010	1
11/03/98	11/07/98		(EPA 1613)	2,3,7,8 - TCDD	ND	PGL	2.8	1
				525 Semivolatiles by GC/MS				
10/23/98	11/02/98	86720	(ML/EPA 525.2)	2,4-Dinitrotoluene	ND	ug/l	0.10	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	alpha-Chlordane	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Acenaphthylene	ND	ug/l	0.10	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Alachlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Aldrin	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Anthracene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Atrazine	0.06	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Benz(a)Anthracene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Benzo(a)pyrene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Benzo(b)Fluoranthene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Benzo(g,h,i)Perylene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Benzo(k)Fluoranthene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Di(2-Ethylhexyl)phthalate	ND	ug/l	0.60	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Butylbenzylphthalate	ND	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Bromacil	ND	ug/l	2.0	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Butachlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Caffeine	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Chrysene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Dibenz(a,h)Anthracene	ND	ug/l	0.050	1

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Kauai Water Department (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilutio:
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Di-(2-Ethylhexyl)adipate	ND	ug/l	0.60	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Diethylphthalate	0.6	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Dieldrin	ND	ug/l	0.20	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Dimethylphthalate	ND	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Dimethoate	ND	ug/l	10	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Di-n-Butylphthalate	ND	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Endrin	ND	ug/l	0.10	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Fluorene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	gamma-Chlordane	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Hexachlorobenzene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Hexachlorocyclopentadiene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Heptachlor	ND	ug/l	0.040	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Heptachlor Epoxide	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Indeno(1,2,3,c,d)Pyrene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Isophorone	ND	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Lindane	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Methoxychlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Metribuzin	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Molinate	ND	ug/l	0.20	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Metolachlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	trans-Nonachlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Pentachlorophenol	ND	ug/l	1.0	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Phenanthrene	ND	ug/l	0.020	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Prometryn	ND	ug/l	0.50	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Propachlor	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Pyrene	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Simazine	ND	ug/l	0.050	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Thiobencarb	ND	ug/l	0.20	1
10/23/98	11/02/98	86720	(ML/EPA 525.2)	Trifluralin	ND	ug/l	0.10	1
			(Surrogate)	Perylene-d12	92	% Rec		

Aldicarbs

	10/21/98	86219	(ML/EPA 531.1)	3-Hydroxycarbofuran	ND	ug/l	2.0	1
	10/21/98	86219	(ML/EPA 531.1)	Aldicarb (Temik)	ND	ug/l	0.50	1
	10/21/98	86219	(ML/EPA 531.1)	Aldicarb sulfone	ND	ug/l	0.80	1
	10/21/98	86219	(ML/EPA 531.1)	Aldicarb sulfoxide	ND	ug/l	0.50	1

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Laboratory
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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	10/21/98	86219	(ML/EPA 531.1)	Baygon	ND	ug/l	2.0	1
	10/21/98	86219	(ML/EPA 531.1)	Carbofuran (Furadan)	ND	ug/l	0.90	1
	10/21/98	86219	(ML/EPA 531.1)	Carbaryl	ND	ug/l	2.0	1
	10/21/98	86219	(ML/EPA 531.1)	Methiocarb	ND	ug/l	2.0	1
	10/21/98	86219	(ML/EPA 531.1)	Methomyl	ND	ug/l	1.0	1
	10/21/98	86219	(ML/EPA 531.1)	Oxamyl (Vydate)	ND	ug/l	2.0	1
			(Surrogate)	BDMC	106	% Rec		
Diquat and Paraquat								
10/20/98	10/26/98	86365	(ML/EPA 549.1)	Diquat	ND	ug/l	0.40	1
10/20/98	10/26/98	86365	(EPA 549.1)	Paraquat	ND	ug/l	2.0	1
EDB and DBCP by GC-ECD								
10/23/98	10/24/98	86376	(ML/EPA 504.1)	Dibromochloropropane (DBCP)	ND	ug/l	0.010	1
10/23/98	10/24/98	86376	(ML/EPA 504.1)	Ethylene Dibromide (EDB)	ND	ug/l	0.010	1
			(Surrogate)	1,2-dibromopropane	90	% Rec		
Herbicides by 515.1								
10/22/98	10/28/98	86562	(ML/EPA 515.1)	2,4,5-T	ND	ug/l	0.20	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	2,4,5-TP (Silvex)	ND	ug/l	0.20	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	2,4-D	ND	ug/l	0.10	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	2,4-DB	ND	ug/l	2.0	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Dichlorprop	ND	ug/l	0.50	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Acifluorfen (qualitative)	ND	ug/l	0.20	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Bentazon	ND	ug/l	0.50	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Dalapon (qualitative)	ND	ug/l	1.0	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	3,5-Dichlorobenzoic acid	ND	ug/l	0.60	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	DCPA	ND	ug/l	0.20	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Dicamba	ND	ug/l	0.080	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Dinoseb	ND	ug/l	0.20	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Pentachlorophenol	ND	ug/l	0.040	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	Picloram	ND	ug/l	0.10	1
10/22/98	10/28/98	86562	(ML/EPA 515.1)	4-Nitrophenol (qualitative)	ND	ug/l	5.0	1
			(Surrogate)	2,4-Dichlorophenylacetic acid	108	% Rec		

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
				ICPMS Metals				
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Arsenic, Total, ICAP/MS	ND	ug/l	5.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Barium, Total, ICAP/MS	ND	ug/l	10	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Beryllium, Total, ICAP/MS	ND	ug/l	1.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Cadmium, Total, ICAP/MS	ND	ug/l	0.50	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Chromium, Total, ICAP/MS	5.8	ug/l	5.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Copper, Total, ICAP/MS	ND	ug/l	50	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Nickel, Total, ICAP/MS	ND	ug/l	5.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Lead, Total, ICAP/MS	ND	ug/l	5.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Antimony, Total, ICAP/MS	ND	ug/l	2.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Selenium, Total, ICAP/MS	ND	ug/l	5.0	1
10/26/98	10/26/98	86494	(EPA/ML 200.8)	Thallium, Total, ICAP/MS	ND	ug/l	1.0	1
				Nitrate by IC as NO3 & N				
	10/21/98	86388	(ML/EPA 300.0)	Nitrate-N by IC	1.2	mg/l	0.10	1
	10/21/98	86388	(ML/EPA 300.0)	Nitrate as NO3 by IC	5.3	mg/l	0.44	1
				SDWA Pesticides				
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1016 Aroclor	ND	ug/l	0.070	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1221 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1232 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1242 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1248 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1254 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	PCB 1260 Aroclor	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Alpha-BHC	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Alachlor (Alanex)	ND	ug/l	0.050	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Aldrin	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Beta-BHC	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Chlordane	ND	ug/l	0.10	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Chlorthalonil (Draconil,Bravo)	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Delta-BHC	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	p,p' DDD	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	p,p' DDE	ND	ug/l	0.010	1

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repared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
0/20/98	10/30/98	86718	(ML/EPA 508)	p,p' DDT	ND	ug/l	0.010	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Dieldrin	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Endrin Aldehyde	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Endrin	ND	ug/l	0.010	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Endosulfan I (alpha)	ND	ug/l	0.010	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Endosulfan II (beta)	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Endosulfan sulfate	ND	ug/l	0.010	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Heptachlor	ND	ug/l	0.010	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Heptachlor Epoxide	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Lindane (gamma-BHC)	ND	ug/l	0.010	1
10/20/98	10/30/98	86718	(ML/EPA 508)	Methoxychlor	ND	ug/l	0.050	1
0/20/98	10/30/98	86718	(ML/EPA 508)	Toxaphene	ND	ug/l	0.50	1
			(Surrogate)	Dibutyl Chlorendate	80	% Rec		
			(Surrogate)	Tetrachloromecaxylene	104	% Rec		
				Volatile Organic Compounds				
	10/22/98	86341	(ML/EPA 502.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1-Dichloroethene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2-Dichlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,3-Dichlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,4-Dichlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	2-Chlorotoluene	ND	ug/l	0.50	1

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilutio
	10/22/98	86341	(ML/EPA 502.2)	4-Chlorotoluene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Bromodichloromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Benzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Bromobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Bromochloromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Bromomethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	cis-1,2-Dichloroethene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Chlorobenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Carbon tetrachloride	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Bromoform	ND	ug/l	0.50	1
	10/23/98	86341	(ML/EPA 502.2)	Chloroform	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Chloroethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Chloromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Dibromochloromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2-Dibromo-3-chloropropane	ND	ug/l	1.0	1
	10/22/98	86341	(ML/EPA 502.2)	Dibromomethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	1,2-Dibromoethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Ethylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Isopropylbenzene	ND	ug/l	0.50	1
	10/23/98	86341	(ML/EPA 502.2)	Methylene chloride	1.5	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	m+p-Xylenes	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Methyl tert-butyl ether	ND	ug/l	5.0	1
	10/22/98	86341	(ML/EPA 502.2)	Naphthalene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	n-Butylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	n-Propylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	o-Xylene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Styrene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	trans-1,2-Dichloroethene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1

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Kauai Water Department
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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	10/22/98	86341	(ML/EPA 502.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Toluene	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Trichlorofluoromethane	ND	ug/l	0.50	1
	10/22/98	86341	(ML/EPA 502.2)	Vinyl chloride	ND	ug/l	0.30	1
			(Surrogate)	Bromofluorobenzene-ELCD	89	% Rec		
			(Surrogate)	Bromofluorobenzene-PID	84	% Rec		
			(Surrogate)	Chlorofluorobenzene-ELCD	89	% Rec		
			(Surrogate)	Chlorofluorobenzene-PID	89	% Rec		

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Kauai Water Department

QC Batch #86095

Specific Conductance

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	lab # 98	1020033		(0.00 - 0.00)	

QC Batch #86098

Lab pH

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	lab # 98	1021005		(0.00 - 0.00)	

QC Batch #86117

Calcium, Total, ICAP

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1016035		(0.00 - 0.00)	
LCS1	Calcium, Total, ICAP	50	49.5	99.0	(85.00 - 115.00)	
LCS2	Calcium, Total, ICAP	50	50.2	100.4	(85.00 - 115.00)	1.4
MBLK	Calcium, Total, ICAP	ND				
MS	Calcium, Total, ICAP	50	47.0	94.0	(70.00 - 130.00)	
MSD	Calcium, Total, ICAP	50	45.8	91.6	(70.00 - 130.00)	2.6

QC Batch #86219

Aldicarbs

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	3-Hydroxycarbofuran	20.0	20.0	100.0	(80.00 - 120.00)	
MBLK	3-Hydroxycarbofuran	ND				
MS	3-Hydroxycarbofuran	20.0	20.2	101.0	(80.00 - 120.00)	
MS	Spiked sample	Lab # 98	1007165		(0.00 - 0.00)	
LCS1	Aldicarb (Temik)	20.0	18.6	93.0	(80.00 - 120.00)	
MBLK	Aldicarb (Temik)	ND				
MS	Aldicarb (Temik)	20.0	20.1	100.5	(80.00 - 120.00)	
LCS1	Aldicarb sulfone	20.0	19.1	95.5	(80.00 - 120.00)	
MBLK	Aldicarb sulfone	ND				
MS	Aldicarb sulfone	20.0	19.2	96.0	(80.00 - 120.00)	
LCS1	Aldicarb sulfoxide	20.0	19.2	96.0	(80.00 - 120.00)	
MBLK	Aldicarb sulfoxide	ND				
MS	Aldicarb sulfoxide	20.0	19.8	99.0	(80.00 - 120.00)	

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

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LCS1	Baygon	20.0	19.8	99.0	(80.00 - 120.00)
MBLK	Baygon	ND			
MS	Baygon	20.0	19.8	99.0	(80.00 - 120.00)
LCS1	Carbofuran (Furadan)	20.0	19.8	99.0	(80.00 - 120.00)
MBLK	Carbofuran (Furadan)	ND			
MS	Carbofuran (Furadan)	20.0	19.9	99.5	(80.00 - 120.00)
LCS1	Carbaryl	20.0	18.7	93.5	(80.00 - 120.00)
MBLK	Carbaryl	ND			
MS	Carbaryl	20.0	19.9	99.5	(80.00 - 120.00)
LCS1	Methiocarb	20.0	20.5	102.5	(80.00 - 120.00)
MBLK	Methiocarb	ND			
MS	Methiocarb	20.0	19.6	98.0	(80.00 - 120.00)
LCS1	Methomyl	20.0	19.2	96.0	(80.00 - 120.00)
MBLK	Methomyl	ND			
MS	Methomyl	20.0	19.9	99.5	(80.00 - 120.00)
LCS1	Oxamyl (Vydate)	20.0	20.1	100.5	(80.00 - 120.00)
MBLK	Oxamyl (Vydate)	ND			
MS	Oxamyl (Vydate)	20.0	19.8	99.0	(80.00 - 120.00)

QC Batch #86341 Volatile Organic Compounds

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	1,1,1,2-Tetrachloroethane	4.0	4.0	100.0	(80.00 - 120.00)	
MBLK	1,1,1,2-Tetrachloroethane	ND				
LCS1	1,1,1-Trichloroethane	4.0	4.2	105.0	(80.00 - 120.00)	
MBLK	1,1,1-Trichloroethane	ND				
LCS1	1,1,2,2-Tetrachloroethane	4.0	4.6	115.0	(80.00 - 120.00)	
MBLK	1,1,2,2-Tetrachloroethane	ND				
LCS1	1,1,2-Trichloroethane	4.0	4.2	105.0	(80.00 - 120.00)	
MBLK	1,1,2-Trichloroethane	ND				
LCS1	1,1-Dichloroethane	4.0	3.9	97.5	(80.00 - 120.00)	
MBLK	1,1-Dichloroethane	ND				
LCS1	1,1-Dichloroethene	4.0	3.8	95.0	(80.00 - 120.00)	
MBLK	1,1-Dichloroethene	ND				
LCS1	1,1-Dichloropropene	4.0	4.2	105.0	(80.00 - 120.00)	
MBLK	1,1-Dichloropropene	ND				

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LCS1	1,2,3-Trichloropropane	4.0	4.7	117.5	(80.00 - 120.00)
MBLK	1,2,3-Trichloropropane	ND			
LCS1	1,2,3-Trichlorobenzene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	1,2,3-Trichlorobenzene	ND			
LCS1	1,2,4-Trichlorobenzene	4.0	3.5	87.5	(80.00 - 120.00)
MBLK	1,2,4-Trichlorobenzene	ND			
LCS1	1,2,4-Trimethylbenzene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	1,2,4-Trimethylbenzene	ND			
LCS1	1,2-Dichloroethane	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	1,2-Dichloroethane	ND			
LCS1	1,2-Dichlorobenzene	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	1,2-Dichlorobenzene	ND			
LCS1	1,2-Dichloropropane	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	1,2-Dichloropropane	ND			
LCS1	1,3,5-Trimethylbenzene	4.0	3.6	90.0	(80.00 - 120.00)
MBLK	1,3,5-Trimethylbenzene	ND			
LCS1	1,3-Dichlorobenzene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	1,3-Dichlorobenzene	ND			
LCS1	1,3-Dichlorobenzene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	1,3-Dichlorobenzene	ND			
LCS1	1,3-Dichloropropane	4.0	4.2	105.0	(80.00 - 120.00)
MBLK	1,3-Dichloropropane	ND			
LCS1	1,4-Dichlorobenzene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	1,4-Dichlorobenzene	ND			
LCS1	2,2-Dichloropropane	8.0	9.4	117.5	(80.00 - 120.00)
MBLK	2,2-Dichloropropane	ND			
LCS1	2-Chlorotoluene	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	2-Chlorotoluene	ND			
LCS1	4-Chlorotoluene	4.0	4.2	105.0	(80.00 - 120.00)
MBLK	4-Chlorotoluene	ND			
LCS1	Bromodichloromethane	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	Bromodichloromethane	ND			
LCS1	Benzene	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	Benzene	ND			
LCS1	Bromobenzene	4.0	4.1	102.5	(80.00 - 120.00)
MBLK	Bromobenzene	ND			
LCS1	Bromochloromethane	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	Bromochloromethane	ND			
LCS1	Bromomethane	2.0	1.9	95.0	(80.00 - 120.00)

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MBLK	Bromomethane	ND			
LCS1	cis-1,2-Dichloroethene	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	cis-1,2-Dichloroethene	ND			
LCS1	Chlorobenzene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	Chlorobenzene	ND			
LCS1	Carbon tetrachloride	4.0	4.2	105.0	(80.00 - 120.00)
MBLK	Carbon tetrachloride	ND			
LCS1	cis-1,3-Dichloropropene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	cis-1,3-Dichloropropene	ND			
LCS1	Bromoform	4.0	4.3	107.5	(80.00 - 120.00)
MBLK	Bromoform	ND			
LCS1	Chloroform	10	11	110.0	(80.00 - 120.00)
MBLK	Chloroform	ND			
LCS1	Chloroethane	2.0	1.9	95.0	(80.00 - 120.00)
MBLK	Chloroethane	ND			
LCS1	Chloromethane	2.0	2.0	100.0	(80.00 - 120.00)
MBLK	Chloromethane	ND			
LCS1	Dibromochloromethane	4.0	4.3	107.5	(80.00 - 120.00)
MBLK	Dibromochloromethane	ND			
LCS1	1,2-Dibromo-3-chloropropane	4.0	4.4	110.0	(80.00 - 120.00)
MBLK	1,2-Dibromo-3-chloropropane	ND			
LCS1	Dibromomethane	4.0	4.5	112.5	(80.00 - 120.00)
MBLK	Dibromomethane	ND			
LCS1	Dichlorodifluoromethane	2.0	2.0	100.0	(80.00 - 120.00)
MBLK	Dichlorodifluoromethane	ND			
LCS1	1,2-Dibromoethane	4.0	4.4	110.0	(80.00 - 120.00)
MBLK	1,2-Dibromoethane	ND			
LCS1	Ethylbenzene	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	Ethylbenzene	ND			
LCS1	Hexachlorobutadiene	4.0	3.5	87.5	(80.00 - 120.00)
MBLK	Hexachlorobutadiene	ND			
LCS1	Isopropylbenzene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	Isopropylbenzene	ND			
LCS1	Methylene chloride	4.0	4.1	102.5	(80.00 - 120.00)
MBLK	Methylene chloride	ND			
LCS1	m+p-Xylenes	8.0	7.8	97.5	(80.00 - 120.00)
MBLK	m+p-Xylenes	ND			

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LCS1	Methyl tert-butyl ether	40	45	112.5	(80.00 - 120.00)
MBLK	Methyl tert-butyl ether	ND			
LCS1	Naphthalene	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	Naphthalene	ND			
LCS1	n-Butylbenzene	4.0	3.6	90.0	(80.00 - 120.00)
MBLK	n-Butylbenzene	ND			
LCS1	n-Propylbenzene	4.0	3.5	87.5	(80.00 - 120.00)
MBLK	n-Propylbenzene	ND			
LCS1	o-Xylene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	o-Xylene	ND			
LCS1	Tetrachloroethylene (PCE)	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	Tetrachloroethylene (PCE)	ND			
LCS1	p-Isopropyltoluene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	p-Isopropyltoluene	ND			
LCS1	sec-Butylbenzene	4.0	3.7	92.5	(80.00 - 120.00)
MBLK	sec-Butylbenzene	ND			
LCS1	Styrene	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	Styrene	ND			
LCS1	Chlorofluorobenzene (surr) PID	100	108	108.0	(80.00 - 120.00)
MBLK	Chlorofluorobenzene (surr) PID	100	97	97.0	
LCS1	Bromofluorobenzene (surr) PID	100	113	113.0	(80.00 - 120.00)
MBLK	Bromofluorobenzene (surr) PID	100	105	105.0	
LCS1	Chlorofluorobenzene (surr) ELC	100	103	103.0	(80.00 - 120.00)
MBLK	Chlorofluorobenzene (surr) ELC	100	95	95.0	
LCS1	Bromofluorobenzene (surr) ELCD	100	108	108.0	(80.00 - 120.00)
MBLK	Bromofluorobenzene (surr) ELCD	100	91	91.0	
LCS1	trans-1,2-Dichloroethene	4.0	4.0	100.0	(80.00 - 120.00)
MBLK	trans-1,2-Dichloroethene	ND			
LCS1	tert-Butylbenzene	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	tert-Butylbenzene	ND			
LCS1	Trichloroethylene (TCE)	4.0	3.8	95.0	(80.00 - 120.00)
MBLK	Trichloroethylene (TCE)	ND			
MBLK	Trichlorotrifluoroethane(Freon	ND			
LCS1	Trichlorotrifluoroethane(Freon	2.0	2.2	110.0	(80.00 - 120.00)
LCS1	trans-1,3-Dichloropropene	4.0	3.9	97.5	(80.00 - 120.00)
MBLK	trans-1,3-Dichloropropene	ND			
LCS1	Toluene	4.0	3.8	95.0	(80.00 - 120.00)

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MBLK	Toluene	ND			
LCS1	Trichlorofluoromethane	2.0	1.9	95.0	(80.00 - 120.00)
MBLK	Trichlorofluoromethane	ND			
LCS1	Vinyl chloride	2.0	2.0	100.0	(80.00 - 120.00)
MBLK	Vinyl chloride	ND			

QC Batch #86365 Diquat and Paraquat

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1020025		(0.00 - 0.00)	
LCS1	Diquat	10.0	10.3	103.0	(0.00 - 366.59)	
MBLK	Diquat	ND				
MS	Diquat	10.0	9.9	99.0	(70.00 - 130.00)	
LCS1	Paraquat	10.0	8.4	84.0	(70.00 - 130.00)	
MBLK	Paraquat	ND				
MS	Paraquat	10.0	8.6	86.0	(70.00 - 130.00)	

QC Batch #86376 EDB and DBCP by GC-ECD

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Spiked sample	Lab # 98	1021039		(0.00 - 0.00)	
MS	Spiked sample	Lab # 98	1020033		(0.00 - 0.00)	
DUP	Dibromochloropropane (DBCP)	ND	ND		(0.00 - 20.00)	
LCS1	Dibromochloropropane (DBCP)	0.05	0.05	100.0	(60.00 - 140.00)	
LCS2	Dibromochloropropane (DBCP)	0.10	0.09	90.0	(60.00 - 140.00)	
MBLK	Dibromochloropropane (DBCP)	ND				
MS	Dibromochloropropane (DBCP)	0.10	0.09	90.0	(60.00 - 140.00)	
DUP	Ethylene Dibromide (EDB)	ND	ND		(0.00 - 20.00)	
LCS1	Ethylene Dibromide (EDB)	0.05	0.05	100.0	(60.00 - 140.00)	
LCS2	Ethylene Dibromide (EDB)	0.10	0.09	90.0	(60.00 - 140.00)	
MBLK	Ethylene Dibromide (EDB)	ND				
MS	Ethylene Dibromide (EDB)	0.10	0.09	90.0	(60.00 - 140.00)	
DUP	1,2-dibromopropane (surr)	100	99	99.0	(60.00 - 140.00)	
LCS1	1,2-dibromopropane (surr)	100	95	95.0	(60.00 - 140.00)	
LCS2	1,2-dibromopropane (surr)	100	82	82.0	(60.00 - 140.00)	15

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MBLK	1,2-dibromopropane (surr)	100	95	95.0		
MS	1,2-dibromopropane (surr)	100	91	91.0	(60.00 - 140.00)	

QC Batch #86377 Glyphosate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1014097		(0.00 - 0.00)	
LCS1	Glyphosate	50	53.4	106.8	(70.00 - 130.00)	
MBLK	Glyphosate	ND				
MS	Glyphosate	50	54.6	109.2	(70.00 - 130.00)	

QC Batch #86384 Nitrite, Nitrogen by IC

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1020033		(0.00 - 0.00)	
LCS1	Nitrite, Nitrogen by IC	1.0	1.07	107.0	(90.00 - 110.00)	
LCS2	Nitrite, Nitrogen by IC	1.0	1.05	105.0	(90.00 - 110.00)	1.9
MBLK	Nitrite, Nitrogen by IC	ND				
MS	Nitrite, Nitrogen by IC	1.0	1.05	105.0	(80.00 - 120.00)	
MSD	Nitrite, Nitrogen by IC	1.0	1.05	105.0	(80.00 - 120.00)	0.00

QC Batch #86388 Nitrate by IC as NO3 & N

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1020033		(0.00 - 0.00)	
LCS1	Nitrate-N	2.5	2.65	106.0	(90.00 - 110.00)	
LCS2	Nitrate-N	2.5	2.65	106.0	(90.00 - 110.00)	0.00
MS	Nitrate-N	2.5	2.72	108.8	(75.00 - 125.00)	
MSD	Nitrate-N	2.5	2.72	108.8	(75.00 - 125.00)	0.00
MBLK	Nitrate as NO3 by IC	ND				

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QC Batch #86389 Alkalinity

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1022259		(0.00 - 0.00)	
LCS1	Alkalinity	96.2	98.6	102.0	(90.00 - 110.00)	
LCS2	Alkalinity	96.2	98.5	101.6	(90.00 - 110.00)	0.10
MBLK	Alkalinity	ND				
MS	Alkalinity	96.2	92.7	95.6	(80.00 - 120.00)	
MSD	Alkalinity	96.2	94.3	98.0	(80.00 - 120.00)	1.7

QC Batch #86438 Cyanide

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1023022		(0.00 - 0.00)	
LCS1	Cyanide	0.10	0.108	108.0	(90.00 - 110.00)	
MBLK	Cyanide	ND				
MS	Cyanide	0.096	0.109	113.5	(80.00 - 120.00)	
MSD	Cyanide	0.096	0.112	116.7	(80.00 - 120.00)	2.7

QC Batch #86494 ICPMS Metals

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Arsenic, Total, ICAP/MS	20	20.4	102.0	(85.00 - 115.00)	
MBLK	Arsenic, Total, ICAP/MS	ND				
LCS1	Barium, Total, ICAP/MS	100	101	101.0	(85.00 - 115.00)	
MBLK	Barium, Total, ICAP/MS	ND				
LCS1	Beryllium, Total, ICAP/MS	5	4.65	93.0	(85.00 - 115.00)	
MBLK	Beryllium, Total, ICAP/MS	ND				
LCS1	Cadmium, Total, ICAP/MS	20	19.9	99.5	(85.00 - 115.00)	
MBLK	Cadmium, Total, ICAP/MS	ND				
LCS1	Chromium, Total, ICAP/MS	100	95	95.0	(85.00 - 115.00)	
MBLK	Chromium, Total, ICAP/MS	ND				
LCS1	Copper, Total, ICAP/MS	100	98	98.0	(85.00 - 115.00)	

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MBLK	Copper, Total, ICAP/MS	ND			
LCS1	Nickel, Total, ICAP/MS	50	51.1	102.2	(85.00 - 115.00)
MBLK	Nickel, Total, ICAP/MS	ND			
LCS1	Lead, Total, ICAP/MS	20	19.2	96.0	(85.00 - 115.00)
MBLK	Lead, Total, ICAP/MS	ND			
LCS1	Antimony, Total, ICAP/MS	50	46.9	93.8	(85.00 - 115.00)
MBLK	Antimony, Total, ICAP/MS	ND			
LCS1	Selenium, Total, ICAP/MS	20	19.4	97.0	(85.00 - 115.00)
MBLK	Selenium, Total, ICAP/MS	ND			
LCS1	Thallium, Total, ICAP/MS	20	19.2	96.0	(85.00 - 115.00)
MBLK	Thallium, Total, ICAP/MS	ND			

QC Batch #86562 Herbicides by 515.1

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	2,4,5-T	0.20	0.22	110.0	(68.00 - 166.00)	
MBLK	2,4,5-T	ND				
MS	2,4,5-T	0.20	0.21	105.0	(68.00 - 166.00)	
LCS1	2,4,5-TP (Silvex)	0.20	0.21	105.0	(42.00 - 226.00)	
MBLK	2,4,5-TP (Silvex)	ND				
MS	2,4,5-TP (Silvex)	0.20	0.20	100.0	(42.00 - 226.00)	
LCS1	2,4-D	0.10	0.08	80.0	(49.00 - 214.00)	
MBLK	2,4-D	ND				
MS	2,4-D	0.10	0.09	90.0	(49.00 - 214.00)	
LCS1	2,4-DB	2.00	2.0	100.0	(48.00 - 126.00)	
MBLK	2,4-DB	ND				
MS	2,4-DB	2.00	1.6	80.0	(48.00 - 126.00)	
LCS1	Dichlorprop	0.50	0.50	100.0	(46.00 - 168.00)	
MBLK	Dichlorprop	ND				
MS	Dichlorprop	0.50	0.41	82.0	(46.00 - 168.00)	
MS	Spiked sample	Lab # 98	1015006		(0.00 - 0.00)	
LCS1	Acifluorfen (qualitative)	0.20	0.14	70.0	(74.00 - 168.00)	
MBLK	Acifluorfen (qualitative)	ND				
MS	Acifluorfen (qualitative)	0.20	0.12	60.0	(74.00 - 168.00)	
LCS1	Bentazon	0.50	0.50	100.0	(70.00 - 170.00)	
MBLK	Bentazon	ND				

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MS	Bentazon	0.50	0.48	96.0	(70.00 - 170.00)
LCS1	Dalapon (qualitative)	1.00	0.94	94.0	(40.00 - 160.00)
MBLK	Dalapon (qualitative)	ND			
MS	Dalapon (qualitative)	1.00	0.75	75.0	(40.00 - 160.00)
LCS1	3,5-Dichlorobenzoic acid	0.50	0.49	98.0	(53.00 - 151.00)
MBLK	3,5-Dichlorobenzoic acid	ND			
MS	3,5-Dichlorobenzoic acid	0.50	0.46	92.0	(53.00 - 151.00)
LCS1	DCPA	0.20	0.17	85.0	(44.00 - 104.00)
MBLK	DCPA	ND			
MS	DCPA	0.20	0.20	100.0	(44.00 - 104.00)
LCS1	Dicamba	0.05	0.04	80.0	(38.00 - 232.00)
MBLK	Dicamba	ND			
MS	Dicamba	0.05	0.04	80.0	(38.00 - 232.00)
LCS1	Dinoseb	0.20	0.02	10.0	(0.00 - 85.00)
MBLK	Dinoseb	ND			
MS	Dinoseb	0.20	0.14	70.0	(0.00 - 85.00)
LCS1	Pentachlorophenol	0.04	0.03	75.0	(36.00 - 224.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	0.04	0.03	75.0	(36.00 - 224.00)
LCS1	Picloram	0.10	0.09	90.0	(45.00 - 138.00)
MBLK	Picloram	ND			
MS	Picloram	0.10	0.10	100.0	(45.00 - 138.00)
LCS1	4-Nitrophenol (qualitative)	1.00	0.95	95.0	(60.00 - 202.00)
MBLK	4-Nitrophenol (qualitative)	ND			
MS	4-Nitrophenol (qualitative)	1.00	0.89	89.0	(60.00 - 202.00)
LCS1	2,4-Dichlorophenylacetic acid	100	128	128.0	(70.00 - 130.00)
MBLK	2,4-Dichlorophenylacetic acid	100	109	109.0	
MS	2,4-Dichlorophenylacetic acid	100	123	123.0	(70.00 - 130.00)

QC Batch #86628 Fluoride

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1023021		(0.00 - 0.00)	
LCS1	Fluoride	0.87	0.88	101.1	(90.00 - 110.00)	
LCS2	Fluoride	0.87	0.89	102.3	(90.00 - 110.00)	1.1
MBLK	Fluoride	ND				

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MS	Fluoride	0.909	0.920	107.8	(80.00 - 120.00)	
MSD	Fluoride	0.909	0.988	108.7	(80.00 - 120.00)	0.81

QC Batch #86658

Mercury

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1027060		(0.00 - 0.00)	
LCS1	Mercury	1.56	1.56	100.0	(85.00 - 115.00)	
LCS2	Mercury	1.56	1.56	100.0	(85.00 - 115.00)	0.00
MBLK	Mercury	ND				
MS	Mercury	1.56	1.53	98.0	(80.00 - 120.00)	
MSD	Mercury	1.56	1.44	92.0	(80.00 - 120.00)	6.1

QC Batch #86718

SDWA Pesticides

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	PCB 1016 Aroclor	ND				
MBLK	PCB 1221 Aroclor	ND				
MBLK	PCB 1232 Aroclor	ND				
LCS1	PCB 1242 Aroclor	0.350	0.291	83.0	(70.00 - 130.00)	
MBLK	PCB 1242 Aroclor	ND				
MBLK	PCB 1248 Aroclor	ND				
MBLK	PCB 1254 Aroclor	ND				
MBLK	PCB 1260 Aroclor	ND				
LCS1	Alpha-BHC	0.050	0.043	86.0	(62.00 - 122.00)	
MBLK	Alpha-BHC	ND				
MS	Alpha-BHC	0.050	0.054	108.0	(62.00 - 122.00)	
MS	Spiked sample	Lab # 98	1019005		(0.00 - 0.00)	
MBLK	Alachlor (Alanex)	ND				
LCS1	Alachlor (Alanex)	0.100	0.077	77.0	(70.00 - 130.00)	
MS	Alachlor (Alanex)	0.100	0.099	99.0	(70.00 - 130.00)	
LCS1	Aldrin	0.050	0.028	56.0	(56.00 - 116.00)	
MBLK	Aldrin	ND				
MS	Aldrin	0.050	0.051	102.0	(56.00 - 116.00)	
LCS1	Beta-BHC	0.050	0.040	80.0	(65.00 - 125.00)	

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

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a Division of Montgomery Watson Americas, Inc.
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Pasadena, California 91101
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Laboratory
QC Report
#48372

Kauai Water Department
(continued)

MBLK	Beta-BHC	ND			
MS	Beta-BHC	0.050	0.054	108.0	(65.00 - 125.00)
MBLK	Chlordane	ND			
LCS1	Chlorthalonil (Draconil,Bravo)	0.100	0.071	71.0	(61.00 - 121.00)
MBLK	Chlorthalonil (Draconil,Bravo)	ND			
MS	Chlorthalonil (Draconil,Bravo)	0.100	0.097	97.0	(61.00 - 121.00)
LCS1	Delta-BHC	0.050	0.042	84.0	(68.00 - 136.00)
MBLK	Delta-BHC	ND			
MS	Delta-BHC	0.050	0.052	104.0	(68.00 - 136.00)
LCS1	p,p' DDD	0.100	0.076	76.0	(77.00 - 137.00)
MBLK	p,p' DDD	ND			
MS	p,p' DDD	0.100	0.086	86.0	(63.00 - 135.00)
LCS1	p,p' DDE	0.100	0.080	80.0	(63.00 - 135.00)
MBLK	p,p' DDE	ND			
MS	p,p' DDE	0.100	0.107	107.0	(63.00 - 135.00)
LCS1	p,p' DDT	0.100	0.086	86.0	(62.00 - 162.00)
MBLK	p,p' DDT	ND			
MS	p,p' DDT	0.100	0.100	100.0	(62.00 - 162.00)
MBLK	p,p' DDT	ND			
MS	p,p' DDT	0.100	0.100	100.0	(62.00 - 162.00)
LCS1	Dieldrin	0.100	0.086	86.0	(57.00 - 117.00)
MBLK	Dieldrin	ND			
MS	Dieldrin	0.100	0.108	108.0	(57.00 - 117.00)
LCS1	Endrin Aldehyde	0.100	0.056	56.0	(58.00 - 118.00)
MBLK	Endrin Aldehyde	ND			
MS	Endrin Aldehyde	0.100	0.067	67.0	(58.00 - 118.00)
LCS1	Endrin	0.100	0.088	88.0	(58.00 - 118.00)
MBLK	Endrin	ND			
MS	Endrin	0.100	0.113	113.0	(58.00 - 118.00)
LCS1	Endosulfan I (alpha)	0.050	0.040	80.0	(57.00 - 117.00)
MBLK	Endosulfan I (alpha)	ND			
MS	Endosulfan I (alpha)	0.050	0.051	102.0	(62.00 - 122.00)
LCS1	Endosulfan II (beta)	0.100	0.081	81.0	(62.00 - 122.00)
MBLK	Endosulfan II (beta)	ND			
MS	Endosulfan II (beta)	0.100	0.096	96.0	(62.00 - 122.00)
LCS1	Endosulfan sulfate	0.100	0.076	76.0	(56.00 - 148.00)
MBLK	Endosulfan sulfate	ND			
MS	Endosulfan sulfate	0.100	0.098	98.0	(56.00 - 148.00)
LCS1	Gamma-BHC (Lindane)	0.050	0.044	88.0	(59.00 - 119.00)

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Kauai Water Department
(continued)

MBLK	Gamma-BHC (Lindane)	ND			
MS	Gamma-BHC (Lindane)	0.050	0.054	108.0	(59.00 - 119.00)
LCS1	Heptachlor	0.050	0.033	66.0	(63.00 - 133.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	0.050	0.059	118.0	(63.00 - 133.00)
LCS1	Heptachlor Epoxide	0.050	0.042	84.0	(57.00 - 117.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	0.050	0.055	110.0	(57.00 - 117.00)
LCS1	Methoxychlor	0.500	0.386	77.2	(64.00 - 146.00)
MBLK	Methoxychlor	ND			
MS	Methoxychlor	0.500	0.501	100.2	(64.00 - 146.00)
LCS1	Tetrachlorometaxylene (surr)	100	77	77.0	(70.00 - 130.00)
MBLK	Tetrachlorometaxylene (surr)	100	92	92.0	
MS	Tetrachlorometaxylene (surr)	100	102	102.0	(70.00 - 130.00)
LCS1	Dibutyl chlorendate (surr)	100	84	84.0	(70.00 - 130.00)
MBLK	Dibutyl chlorendate (surr)	100	104	104.0	
MS	Dibutyl chlorendate (surr)	100	96	96.0	(70.00 - 130.00)
MBLK	Toxaphene	ND			

QC Batch #86720 — 525 Semivolatiles by GC/MS

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	alpha-Chlordane	2	2.01	100.5	(70.00 - 130.00)	
MBLK	alpha-Chlordane	ND				
MS	alpha-Chlordane	2	2.05	102.5	(70.00 - 130.00)	
MBLK	Diazinon	ND				
MS	Spiked sample	Lab # 98	1020025		(0.00 - 0.00)	
LCS1	Acenaphthylene	2	2.15	107.5	(70.00 - 130.00)	
MBLK	Acenaphthylene	ND				
MS	Acenaphthylene	2	2.03	101.5	(70.00 - 130.00)	
LCS1	Alachlor	2	2.20	110.0	(70.00 - 130.00)	
MBLK	Alachlor	ND				
MS	Alachlor	2	2.15	107.5	(70.00 - 130.00)	
LCS1	Aldrin	2	2.21	110.5	(70.00 - 130.00)	
MBLK	Aldrin	ND				
MS	Aldrin	2	2.06	103.0	(70.00 - 130.00)	

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Kauai Water Department
(continued)

LCS1	Anthracene	2	2.12	106.0	(70.00 - 130.00)
MBLK	Anthracene	ND			
MS	Anthracene	2	1.98	99.0	(70.00 - 130.00)
LCS1	Atrazine	2	2.12	106.0	(70.00 - 130.00)
MBLK	Atrazine	ND			
MS	Atrazine	2	2.07	103.5	(70.00 - 130.00)
LCS1	Benz(a)Anthracene	2	2.07	103.5	(70.00 - 130.00)
MBLK	Benz(a)Anthracene	ND			
MS	Benz(a)Anthracene	2	1.99	99.5	(70.00 - 130.00)
LCS1	Benzo(a)pyrene	2	1.93	96.5	(70.00 - 130.00)
MBLK	Benzo(a)pyrene	ND			
MS	Benzo(a)pyrene	2	2.09	104.5	(70.00 - 130.00)
LCS1	Benzo(b)Fluoranthene	2	2.01	100.5	(70.00 - 130.00)
MBLK	Benzo(b)Fluoranthene	ND			
MS	Benzo(b)Fluoranthene	2	2.07	103.5	(70.00 - 130.00)
LCS1	Benzo(g,h,i)Perylene	2	2.13	106.5	(70.00 - 130.00)
MBLK	Benzo(g,h,i)Perylene	ND			
MS	Benzo(g,h,i)Perylene	2	2.25	112.5	(70.00 - 130.00)
LCS1	Benzo(k)Fluoranthene	2	1.97	98.5	(70.00 - 130.00)
MBLK	Benzo(k)Fluoranthene	ND			
MS	Benzo(k)Fluoranthene	2	2.03	101.5	(70.00 - 130.00)
LCS1	Di(2-Ethylhexyl)phthalate	2	2.14	107.0	(70.00 - 130.00)
MBLK	Di(2-Ethylhexyl)phthalate	ND			
MS	Di(2-Ethylhexyl)phthalate	2	2.16	108.0	(70.00 - 130.00)
LCS1	Butylbenzylphthalate	2	2.15	107.5	(70.00 - 130.00)
MBLK	Butylbenzylphthalate	ND			
MS	Butylbenzylphthalate	2	2.02	101.0	(70.00 - 130.00)
MBLK	Bromacil	ND			
MBLK	Butachlor	ND			
LCS1	Caffeine	2	2.11	105.5	(70.00 - 130.00)
MBLK	Caffeine	ND			
MS	Caffeine	2	2.05	102.5	(70.00 - 130.00)
LCS1	Chrysene	2	2.22	111.0	(70.00 - 130.00)
MBLK	Chrysene	ND			
MS	Chrysene	2	2.00	100.0	(70.00 - 130.00)
LCS1	Dibenz(a,h)Anthracene	2	1.95	97.5	(70.00 - 130.00)
MBLK	Dibenz(a,h)Anthracene	ND			

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Laboratory
QC Report
#48372

Kauai Water Department (continued)

MS	Dibenz(a,h)Anthracene	2	2.12	106.0	(70.00 - 130.00)
LCS1	Di-(2-Ethylhexyl)adipate	2	2.19	109.5	(70.00 - 130.00)
MBLK	Di-(2-Ethylhexyl)adipate	ND			
MS	Di-(2-Ethylhexyl)adipate	2	2.12	106.0	(70.00 - 130.00)
LCS1	Diethylphthalate	2	2.30	115.0	(70.00 - 130.00)
MBLK	Diethylphthalate	ND			
MS	Diethylphthalate	2	2.09	104.5	(70.00 - 130.00)
MBLK	Dieldrin	ND			
LCS1	Dimethylphthalate	2	2.15	107.5	(70.00 - 130.00)
MBLK	Dimethylphthalate	ND			
MS	Dimethylphthalate	2	2.03	101.5	(70.00 - 130.00)
MBLK	Dimethoate	ND			
LCS1	Di-n-Butylphthalate	2	2.15	107.5	(70.00 - 130.00)
MBLK	Di-n-Butylphthalate	ND			
MS	Di-n-Butylphthalate	2	1.82	91.0	(70.00 - 130.00)
LCS1	Endrin	2	2.35	117.5	(70.00 - 130.00)
MBLK	Endrin	ND			
MS	Endrin	2	2.05	102.5	(70.00 - 130.00)
LCS1	Fluorene	2	2.26	113.0	(70.00 - 130.00)
MBLK	Fluorene	ND			
MS	Fluorene	2	2.09	104.5	(70.00 - 130.00)
LCS1	gamma-Chlordane	2	2.08	104.0	(70.00 - 130.00)
MBLK	gamma-Chlordane	ND			
MS	gamma-Chlordane	2	1.98	99.0	(70.00 - 130.00)
LCS1	Hexachlorobenzene	2	2.09	104.5	(70.00 - 130.00)
MBLK	Hexachlorobenzene	ND			
MS	Hexachlorobenzene	2	2.08	104.0	(70.00 - 130.00)
LCS1	Hexachlorocyclopentadiene	2	2.21	110.5	(70.00 - 130.00)
MBLK	Hexachlorocyclopentadiene	ND			
MS	Hexachlorocyclopentadiene	2	1.47	73.5	(70.00 - 130.00)
LCS1	Heptachlor	2	2.11	105.5	(70.00 - 130.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	2	2.00	100.0	(70.00 - 130.00)
LCS1	Heptachlor Epoxide	2	2.14	107.0	(70.00 - 130.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	2	2.10	105.0	(70.00 - 130.00)
LCS1	Indeno(1,2,3,c,d)Pyrene	2	2.04	102.0	(70.00 - 130.00)

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Laboratory
QC Report
#48372

Kauai Water Department
(continued)

MBLK	Indeno(1,2,3,c,d) Pyrene	ND			
MS	Indeno(1,2,3,c,d) Pyrene	2	2.23	111.5	(70.00 - 130.00)
MBLK	Isophorone	ND			
LCS1	Lindane	2	2.02	101.0	(70.00 - 130.00)
MBLK	Lindane	ND			
MS	Lindane	2	1.97	98.5	(70.00 - 130.00)
LCS1	Methoxychlor	2	2.21	110.5	(70.00 - 130.00)
MBLK	Methoxychlor	ND			
MS	Methoxychlor	2	2.09	104.5	(70.00 - 130.00)
MBLK	Metribuzin	ND			
LCS1	Molinate	2	2.15	107.5	(70.00 - 130.00)
MBLK	Molinate	ND			
MS	Molinate	2	2.09	104.5	(70.00 - 130.00)
MBLK	Metolachlor	ND			
LCS1	trans-Nonachlor	2	2.06	103.0	(70.00 - 130.00)
MBLK	trans-Nonachlor	ND			
MS	trans-Nonachlor	2	1.82	91.0	(70.00 - 130.00)
LCS1	Pentachlorophenol	8	8.63	107.9	(70.00 - 130.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	8	8.07	100.9	(70.00 - 130.00)
LCS1	Phenanthrene	2	2.09	104.5	(70.00 - 130.00)
MBLK	Phenanthrene	ND			
MS	Phenanthrene	2	2.04	102.0	(70.00 - 130.00)
MBLK	Prometryn	ND			
MBLK	Propachlor	ND			
LCS1	Pyrene	2	2.18	109.0	(70.00 - 130.00)
MBLK	Pyrene	ND			
MS	Pyrene	2	2.17	108.5	(70.00 - 130.00)
LCS1	Simazine	2	2.35	117.5	(70.00 - 130.00)
MBLK	Simazine	ND			
MS	Simazine	2	2.36	118.0	(70.00 - 130.00)
LCS1	Thiobencarb	2	2.14	107.0	(70.00 - 130.00)
MBLK	Thiobencarb	ND			
MS	Thiobencarb	2	1.98	99.0	(70.00 - 130.00)
MBLK	Trifluralin	ND			

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Laboratory
QC Report
#48372

Kauai Water Department
(continued)

QC Batch #86756

Endothall

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 98	1023021		(0.00 - 0.00)	
LCS1	Endothall	.25	29.0	116.0	(83.83 - 141.37)	
MBLK	Endothall	ND				
MS	Endothall	25	27.3	109.2	(80.00 - 120.00)	

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Montgomery Watson Laboratories
555 East Walnut Street
Pasadena, CA 91101
Ph (626) 568-6400 Fax (626) 568-6324

Submittal Form

Date 10/26/98

48382

98-2550

MWL Project # 48382 SubPO# 98-2550

Please refer to the MWL Project Number on all reports and invoices

For prompt payment, send report & invoice to attention of: Martha Frost; Sub-Contract Administrator, ext 6437

Sub Lab Reference#

Ship To Nannie Estrada
Quanterra Environmental Services
880 Riverside Parkway
West Sacramento, CA 95605-1501

Bill Recipient: FEDEX ACCT: 2060-8019-1

(916) 374-4348

Report Due 11/10/98

Formal required: FAX with QC+HARDCOPY

(California State requires Hard Copy report for California Clients)

1. BATCH QC DATA: Duplicate expected values & recoveries; Lab Control Samples) expected values & recoveries; method blank recoveries; Matrix Spike expected values & recoveries.
2. Sample extraction Date and Sample analysis Date.
4. Sample dilution factor.
5. Sample surrogate recovery & Sample Internal Standard recovery or IS area count in cover letter.
6. A cover letter explaining any missed criteria or discrepancies.

If you have any questions about the samples, please call MWL proj mgr Hillary Strayer 626-568-6412
Please notify us if the report due date will not be met so we may inform our client.

Special Requirements

HDS

555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400
Fax: 626 568 6324

A Division of Montgomery Watson Americas, Inc.

4820 South McClintock Avenue
Suite 202
Tempe, Arizona 85282
Tel: 602 755 5001
Fax: 602 755 5201

MONTGOMERY WATSON LABORATORIES

	Test Code	Use MWL Lab # for ID	Client Sample ID for reference only	Analysis Requested	Sample Date	Matrix	Container
1	TCDD-DW	981020033	HANAMAULU WELL 3	Dioxin in drinking water 1613b	10/19/98	dw	2 1L amber glass / no preservative

Rec'd in good condition 10-27-98 AM

Relinquished by: Martin DeMesa Sample Control 10/26/98

Received by: [illegible] 10-27-98 0130

An Acknowledgement of Receipt is requested.

98-2550

Quanterra

NOV 16 RECD

KAUAI
48382

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605

916 373-5600 Telephone
916 372-1059 Fax

November 10, 1998
QUANTERRA INCORPORATED PROJECT NUMBER: 302340
PO/CONTRACT: **MWL Project # 48382/SubPO# 98-2550**

Martha Frost
Montgomery Watson Laboratories
555 East Walnut Street
Pasadena, CA 91101

Dear Ms. Frost:

This report contains the analytical results for the one aqueous sample which was received under chain of custody by Quanterra Incorporated on 27 October 1998.

The case narrative is an integral part of this report.

If you have any questions, please feel free to call.

Sincerely,

Nanny Estrada

Nanny Estrada
Project Manager
Advanced Technology

NE/rrl

Quanterra

TABLE OF CONTENTS

QUANTERRA INCORPORATED PROJECT NUMBER 302340

Quanterra

CASE NARRATIVE

QUANTERRA INCORPORATED PROJECT NUMBER 302340

Detection limits for dioxins and furans are reported on a sample specific basis and all results are recovery corrected per the isotope dilution technique.

There were no anomalies associated with this report.

Quanterra

QUANTERRA INCORPORATED QUALITY CONTROL PROGRAM

Quanterra has implemented an extensive Quality Control (QC) program to ensure the production of scientifically sound, legally defensible data of known documentable quality. This QC program is based upon requirements in "Test Methods for Evaluating Solid Waste", USEPA SW-846, Third Edition. It applies whenever SW-846 analytical methods are used. It also applies in whole or in part whenever project requirements fail to specify some aspect of QC practices described here. It does not apply when other well defined QC programs (e.g. CLP or CLP-like) are specified. This is Quanterra's base QC program for environmental analysis.

Definitions:

Quality Control Batch. The quality control (QC) batch is a set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.

Surrogate. A surrogate (or internal standard) is an organic compound similar in chemical behavior to the target analyte, but not normally found in environmental samples. Surrogates (or IS) are added to all samples in a batch to monitor the effects of both the matrix and the analytical process on accuracy.

Method Blank. A method blank (MB) is a control sample prepared using the same reagents used for the samples. As part of the QC batch, it accompanies the samples through all steps of the sample extraction and cleanup procedure. The method blank is used to monitor the level of contamination introduced to a batch of samples as a result of processing in the laboratory.

Laboratory Control Sample. A laboratory control sample (LCS) is prepared using a well characterized matrix (e.g., reagent water or Ottawa sand) that is spiked with known amounts of representative analytes. Alternate matrices (e.g., glass beads) may be used for soil analyses when Ottawa sand is not appropriate. As part of a QC batch, it accompanies the samples through all steps of the sample extraction and cleanup process. The LCS is used to monitor the accuracy of the analytical process independent of possible interference effects due to sample matrix.

Duplicate Control Sample. A duplicate laboratory control sample (DCS) consists of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects.

Quanterra

SAMPLE DESCRIPTION INFORMATION
for
Montgomery Watson Laboratories

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
302340-0001-MB	Method Blank	AQUEOUS			27 OCT 98
302340-0001-SA	981020033 HANAMAULU WELL 3	AQUEOUS	19 OCT 98		27 OCT 98

Quanterra

2,3,7,8-TCDD
Method 1613B
HIGH RESOLUTION

Client Name: Montgomery Watson Laboratories
Client ID: Method Blank
Lab ID: 302340-0001-MB
Matrix: AQUEOUS
Authorized: 27 OCT 98

Sampled: NA
Prepared: 03 NOV 98

Received: NA
Analyzed: 06 NOV 98

Sample Amount 1.00 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/L	2.8	
	% Recovery			
13C-2,3,7,8-TCDD	86			

ND = Not detected
NA = Not applicable

Reported By: Teri Stone

Approved By: Nanny Estrada

The cover letter is an integral part of this report.
Rev 230787

Quanterra

2,3,7,8-TCDD
Method 1613B
HIGH RESOLUTION

Client Name: Montgomery Watson Laboratories
Client ID: 981020033 HANAMAULU WELL 3
Lab ID: 302340-0001-SA
Matrix: AQUEOUS
Authorized: 27 OCT 98

Sampled: 19 OCT 98
Prepared: 03 NOV 98

Received: 27 OCT 98
Analyzed: 07 NOV 98

Sample Amount 1.04 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/L	2.8	
	% Recovery			
13C-2,3,7,8-TCDD	96			

ND = Not detected
NA = Not applicable

Reported By: Teri Stone

Approved By: Nanny Estrada

The cover letter is an integral part of this report.
Rev 230787

LABORATORY CONTROL SAMPLE REPORT
Advanced Technology Group - High Resolution
Project: 302340

Category: 1613B-DW 2,3,7,8-TCDD by Method 1613B (Drinking Water)
Test: TCDD-1613B-EPA-DW
Matrix: AQUEOUS
QC Lot: 03 NOV 98-A QC Run: 06 NOV 98-A
Concentration Units: pg/uL

Analyte	Concentration Spiked	Measured	Accuracy(%) LCS	Limits
2,3,7,8-TCDD	10.0	11.0	110	73-146
13C-2,3,7,8-TCDD	100	84.9	85	25-141

Calculations are performed before rounding to avoid round-off errors in calculated results.

Oct. 30, 1998

Hanamaulu III (Keith F)

1. 10-28-98 0300 am

Turbidity: 0.4 NTU

Cl-: 22 ppm

2. 10-29-98 0300am

Turbidity 0.625 NTU

Cl-: 22 ppm

3. 10-30-98 0300am

Turbidity 0.475 NTU

Cl- 22 ppm

4. 10-30-98 1320

Turbidity 0.4 NTU

Cl-: 22 ppm

5. 10-27-98 0300

Turbidity: 5.1 NTU

Cl-: 20 ppm

Keith F

Oct 26, 1998

Hanamaulu III (Keith F)

1. 10-26-98 0907
   Turbidity: 36 NTU
   Cl- : 23 ppm

2. 10-26-98 0937
   Turbidity: 11 NTU
   Cl- : 21 ppm

3. 10-26-98 1050
   Turbidity: 3.8 NTU
   Cl-: 23ppm

Keith F.

October 22, 1998

Hanamaulu III (Keith F.)

1. 10-20-98 7:44am

Turbidity: 5.1 NTU

*Cl⁻: 22ppm

2. 10-20-98 11:12 (am?)

Turbidity: 0.65NTU

*Cl⁻: 21ppm

3. 10-22-98 0803am

Turbidity: 7.2 NTU

*Cl⁻: 22ppm

*Cl⁻ analyzed on 10-23-98

Oct. 20, 1998

Hanamaulu III 10-19-98 0735 temp. 25.1°C (carl/cindee)

pH : 6.78
conductivity : 228 µV/cm
turbidity : 0.56 NTU
} Tested on 10-20-98

Total Hardness : 59.6 ppm
Ca Hardness : 24.0 ppm
} Tested on 10-21-98

Microbiology : TNTC

October 20, 1998

Aanamaulu: III (Keith F)

1. 1500 10-16-98

Turbidity: 0.65 NTU

Cl⁻ : 22ppm

2. 2100 10-16-98

Turbidity: 0.69 NTU

Cl⁻ : 22ppm

3. 0300 10-17-98 ~~10-16-98~~

Turbidity: 0.61 NTU

Cl⁻ : 22 ppm

4. 0900 10-17-98

Turbidity: 0.61 NTU

Cl⁻ : 20 ppm

5. 1500 10-17-98

Turbidity: 0.55 NTU.

Cl⁻ : 22ppm

Hanamaulu III cont'd

6. 2100 10-17-98

Turbidity: 0.55 NTU

Cl⁻ : 22ppm

7. 0300 10-18-98 (dirt settled at bottom of container?)

Turbidity: 0.6 NTU

Cl⁻ : 20ppm

8. 0900 10-18-98

Turbidity: 0.61 NTU

Cl⁻ : 21ppm

9. 1500 10-18-98

Turbidity: 0.66 NTU

Cl⁻ : 22ppm

10. 2100 10-18-98

Turbidity: 1.8 NTU

Cl⁻ : 22ppm

Hanamaulu III cont'd

11. 0800 10-19-98

Turbidity: 0.57 NTU

Cl⁻ : 21 ppm

12. 0900 10-19-98

Turbidity: 0.56 NTU

Cl⁻: 22 ppm

13. 1120 10-19-98

Turbidity: 0.6 NTU

Cl⁻ : 21ppm

14 0900 10-16-98 (Tested on 10-21-98)

Turbidity: 0.66 NTU

Cl⁻ : 24ppm

Keith F —

Oct. 16, 1998

Hanamaulu III (Keith F.)

9:00pm 10-15-98

Chlorides: 24ppm

0700 am 10-16-98

Chlorides: 24ppm

10-1-98

(Keith) collected 10-1-98

Hamamoto Well #3

1. 199' turbidity: 17 NTU

2. 170' turbidity: 34 NTU

3. 150' turbidity: 53 NTU

4. 262' Turbidity: 42 NTU

5. 241' Turbidity: 29 NTU

6. 220' Turbidity: 32 NTU

7. 290 23 NTU

8. 339 22 NTU

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Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

HDS Hillary Strayer

Report#: 52081
PHASEV

Report Summary of positive results, PR52081

			Result	MDL	UNITS
Analyzed	990223109	PUKAKI			
Analyzed	990223110	HANAMAULU 3			
Analyzed	990223111	TRAV BLANK-HOLD			

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Laboratory
Report
#52081

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
23-feb-1999 13:06:06

JKAKI (990223109) Sampled on 02/18/99

Regulated VOCs plus Lists 1&3

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromoform	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	ND	ug/l	0.50	1

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	ND	ug/l	0.50	1
	03/02/99	93004	(ML/ES24.2/624)	Methyl Tert-butyl ether (MTBE)	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	ND	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	105	% Rec		
			(Surrogate)	4-Bromofluorobenzene	90	% Rec		

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Kauai Water Department
(continued)

repared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
			(Surrogate)	Toluene-d8	98	% Rec		
NAMAULU 3 (990223110) Sampled on 02/19/99								
				Regulated VOCs plus Lists 1&3				
	03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromoform	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	ND	ug/l	0.50	1

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#52081

Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Chloroethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	ND	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	ND	ug/l	0.50	1
	03/02/99	93004	(ML/E524.2/624)	Methyl Tert-butyl ether (MTBE)	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	ND	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	ND	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	ND	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	110	% Rec		
			(Surrogate)	4-Bromofluorobenzene	87	% Rec		
			(Surrogate)	Toluene-d8	96	% Rec		

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
TRAV BLANK-HOLD (990223111) Sampled on 02/18/99								
				Regulated VOCs plus Lists 1&3				
	03/02/99	93004	(ML/EPA 524.2)	1,1,1,2-Tetrachloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,1-Trichloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2,2-Tetrachloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1,2-Trichloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloroethylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,1-Dichloropropene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichlorobenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,3-Trichloropropane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trichlorobenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2,4-Trimethylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloroethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,2-Dichloropropane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3,5-Trimethylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	1,3-Dichloropropane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Dichlorobenzene (1,4-DCB)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2,2-Dichloropropane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	2-Butanone (MEK)	NA	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	o-Chlorotoluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Chlorotoluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	4-Methyl-2-Pentanone (MIBK)	NA	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Benzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromobenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromomethane (Methyl Bromide)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,2-Dichloroethylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorobenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Carbon Tetrachloride	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	cis-1,3-Dichloropropene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromoform	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroform (Trichloromethane)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromochloromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chloroethane	NA	ug/l	0.50	1

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Laboratory
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#52081

Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	03/02/99	93004	(ML/EPA 524.2)	Chloromethane(Methyl Chloride)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Chlorodibromomethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dibromomethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Bromodichloromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichloromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Di-isopropyl ether	NA	ug/l	5.0	1
	03/02/99	93004	(ML/EPA 524.2)	Ethyl benzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Dichlorodifluoromethane	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Fluorotrichloromethane-Freon11	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Hexachlorobutadiene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Isopropylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m-Dichlorobenzene (1,3-DCB)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	m,p-Xylenes	NA	ug/l	0.50	1
	03/02/99	93004	(ML/ES24.2/624)	Methyl Tert-butyl ether (MTBE)	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	Naphthalene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	n-Propylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Xylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	o-Dichlorobenzene (1,2-DCB)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Tetrachloroethylene (PCE)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	p-Isopropyltoluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	sec-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Styrene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,2-Dichloroethylene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	tert-amyl Methyl Ether	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butyl Ethyl Ether	NA	ug/l	3.0	1
	03/02/99	93004	(ML/EPA 524.2)	tert-Butylbenzene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichloroethylene (TCE)	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	trans-1,3-Dichloropropene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Toluene	NA	ug/l	0.50	1
	03/02/99	93004	(ML/EPA 524.2)	Vinyl chloride (VC)	NA	ug/l	0.30	1
			(Surrogate)	1,2-Dichloroethane-d4	NA	% Rec		
			(Surrogate)	4-Bromofluorobenzene	NA	% Rec		
			(Surrogate)	Toluene-d8	NA	% Rec		

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Kauai Water Department

QC Batch #93004 Regulated VOCs plus Lists 1&3

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	1,1,1,2-Tetrachloroethane	ND				
LCS1	1,1,1-Trichloroethane	4	3.99	99.8	(70.00 - 130.00)	
MBLK	1,1,1-Trichloroethane	ND				
LCS1	1,1,2,2-Tetrachloroethane	4	3.71	92.8	(70.00 - 130.00)	
MBLK	1,1,2,2-Tetrachloroethane	ND				
LCS1	1,1,2-Trichloroethane	4	3.81	95.2	(70.00 - 130.00)	
MBLK	1,1,2-Trichloroethane	ND				
LCS1	1,1-Dichloroethane	4	3.76	94.0	(70.00 - 130.00)	
MBLK	1,1-Dichloroethane	ND				
LCS1	1,1-Dichloroethylene	4	4.42	110.5	(70.00 - 130.00)	
MBLK	1,1-Dichloroethylene	ND				
MBLK	1,1-Dichloropropene	ND				
MBLK	1,2,3-Trichlorobenzene	ND				
MBLK	1,2,3-Trichloropropane	ND				
LCS1	1,2,4-Trichlorobenzene	4	3.87	96.8	(70.00 - 130.00)	
MBLK	1,2,4-Trichlorobenzene	ND				
MBLK	1,2,4-Trimethylbenzene	ND				
LCS1	1,2-Dichloroethane	4	3.97	99.2	(70.00 - 130.00)	
MBLK	1,2-Dichloroethane	ND				
LCS1	1,2-Dichloropropane	4	4.38	109.5	(70.00 - 130.00)	
MBLK	1,2-Dichloropropane	ND				
MBLK	1,3,5-Trimethylbenzene	ND				
LCS1	1,3-Dichloropropane	8	7.43	93.0	(70.00 - 130.00)	
MBLK	1,3-Dichloropropane	ND				
LCS1	p-Dichlorobenzene (1,4-DCB)	4	3.74	93.5	(70.00 - 130.00)	
MBLK	p-Dichlorobenzene (1,4-DCB)	ND				
MBLK	2,2-Dichloropropane	ND				
MBLK	2-Butanone (MEK)	ND				
MBLK	2-Chloroethylvinylether	ND				
MBLK	o-Chlorotoluene	ND				
MBLK	p-Chlorotoluene	ND				
MBLK	4-Methyl-2-Pentanone (MIBK)	ND				
LCS1	Benzene	4	4.22	105.5	(70.00 - 130.00)	
MBLK	Benzene	ND				
MBLK	Bromobenzene	ND				
MBLK	Bromomethane (Methyl Bromide)	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

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Kauai Water Department
(continued)

LCS1	cis-1,2-Dichloroethylene	4	4.23	105.8	(70.00 - 130.00)
MBLK	cis-1,2-Dichloroethylene	ND			
LCS1	Chlorobenzene	4	3.91	97.8	(70.00 - 130.00)
MBLK	Chlorobenzene	ND			
LCS1	Carbon Tetrachloride	4	4.03	100.8	(70.00 - 130.00)
MBLK	Carbon Tetrachloride	ND			
MBLK	cis-1,3-Dichloropropene	ND			
LCS1	Bromoform	4	2.84	71.0	(70.00 - 130.00)
MBLK	Bromoform	ND			
LCS1	Chloroform (Trichloromethane)	4	3.96	99.0	(70.00 - 130.00)
MBLK	Chloroform (Trichloromethane)	ND			
MBLK	Bromochloromethane	ND			
MBLK	Chloroethane	ND			
MBLK	Chloromethane(Methyl Chloride)	ND			
LCS1	Chlorodibromomethane	4	3.61	90.2	(70.00 - 130.00)
MBLK	Chlorodibromomethane	ND			
MBLK	Dibromomethane	ND			
LCS1	Bromodichloromethane	4	3.71	92.8	(70.00 - 130.00)
MBLK	Bromodichloromethane	ND			
LCS1	Dichloromethane	4	4.10	102.5	(70.00 - 130.00)
MBLK	Dichloromethane	ND			
MBLK	Di-isopropyl ether	ND			
LCS1	Ethyl benzene	4	3.90	97.5	(70.00 - 130.00)
MBLK	Ethyl benzene	ND			
MBLK	Dichlorodifluoromethane	ND			
LCS1	Fluorotrichloromethane-Freon11	2	1.71	85.5	(70.00 - 130.00)
MBLK	Fluorotrichloromethane-Freon11	ND			
MBLK	Hexachlorobutadiene	ND			
MBLK	Isopropylbenzene	ND			
MBLK	m-Dichlorobenzene (1,3-DCB)	ND			
LCS1	m,p-Xylenes	8	8.03	100.4	(70.00 - 130.00)
MBLK	m,p-Xylenes	ND			
LCS1	Methyl Tert-butyl ether (MTBE)	8	8.84	110.5	(70.00 - 130.00)
MBLK	Methyl Tert-butyl ether (MTBE)	ND			
MBLK	Naphthalene	ND			
MBLK	n-Butylbenzene	ND			
MBLK	n-Propylbenzene	ND			

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Laboratory
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Kauai Water Department (continued)

LCS1	o-Xylene	4	3.93	98.2	(70.00 - 130.00)
MBLK	o-Xylene	ND			
LCS1	o-Dichlorobenzene (1,2-DCB)	4	3.82	95.5	(70.00 - 130.00)
MBLK	o-Dichlorobenzene (1,2-DCB)	ND			
LCS1	Tetrachloroethylene (PCE)	4	4.15	103.8	(70.00 - 130.00)
MBLK	Tetrachloroethylene (PCE)	ND			
MBLK	p-Isopropyltoluene	ND			
MBLK	sec-Butylbenzene	ND			
LCS1	Styrene	4	3.76	94.0	(70.00 - 130.00)
MBLK	Styrene	ND			
LCS1	trans-1,2-Dichloroethylene	4	4.44	111.0	(70.00 - 130.00)
MBLK	trans-1,2-Dichloroethylene	ND			
MBLK	tert-amyl Methyl Ether	ND			
MBLK	tert-Butyl Ethyl Ether	ND			
MBLK	tert-Butylbenzene	ND			
LCS1	Trichloroethylene (TCE)	4	4.04	101.0	(70.00 - 130.00)
MBLK	Trichloroethylene (TCE)	ND			
LCS1	Trichlorotrifluoroethane(Freon	2	1.79	89.5	(70.00 - 130.00)
MBLK	Trichlorotrifluoroethane(Freon	ND			
MBLK	trans-1,3-Dichloropropene	ND			
LCS1	Toluene	4	4.06	101.5	(70.00 - 130.00)
MBLK	Toluene	ND			
LCS1	Vinyl chloride (VC)	2	1.68	84.0	(70.00 - 130.00)
MBLK	Vinyl chloride (VC)	ND			

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WATER QUALITY ANALYSES

USGS Pukaki Well

MONTGOMERY WATSON LABORATORIES

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Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

Report#: 26390

eport Summary of positive results, PR26390

		Result	MDL	UNITS
nalyzed	960404046 PUKAKI			
4/10/96	Data Entry	04/17/96		--
4/15/96	Chromium, Total, ICAP/MS	7.0	5.000	UGL
4/15/96	Nickel, Total, ICAP/MS	8.5	5.000	UGL
4/10/96	Data Entry	04/12/96		--
4/04/96	Nitrate	0.88	.440	MGL
4/04/96	Nitrate-N by IC	0.2	.100	MGL
4/12/96	Data Entry	04/18/96		--
4/21/96	Data Entry	04/23/96		--
4/10/96	Calcium, Total, ICAP	16	5.000	MGL
nalyzed	960404047 PUKAKI			
4/10/96	Data Entry	04/17/96		--
4/15/96	Chromium, Total, ICAP/MS	11	5.000	UGL
4/15/96	Nickel, Total, ICAP/MS	24	5.000	UGL
4/10/96	Data Entry	04/12/96		--
4/04/96	Nitrate	0.88	.440	MGL
4/04/96	Nitrate-N by IC	0.2	.100	MGL
4/12/96	Data Entry	04/18/96		--
4/21/96	Data Entry	04/23/96		--
4/10/96	Calcium, Total, ICAP	15	5.000	MGL

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Comments
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Group Comments

(ML525) J indicates that the result is below reporting limit
Result for TCDD analysis submitted by Quanterra
Environmental Services.
(508) LCS recoveries fail low for heptachlor and aldrin -
use 525 data for these compounds. LCS recovery fails high
for endrin. Reference QIR-GC-96-070.

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Laboratory
Report
#26390

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
04-apr-1996 14:42:33

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
PUKAKI (960404046) Sampled on 04/02/96								
04/10/96	04/10/96	48285	(EPA/ML 200.7)	Calcium, Total, ICAP	16	mg/l	5.0	1
	04/13/96	48328	(ML/SM4500-CN F)	Cyanide	ND	mg/l	0.025	1
04/08/96	04/11/96	48296	(ML/EPA 548.1)	Endothall	ND	ug/l	5.0	1
	04/08/96	48094	(EPA/ML 340.2)	Fluoride	ND	mg/l	0.10	1
	04/11/96	48301	(ML/EPA 547)	Glyphosate	ND	ug/l	6.0	1
04/05/96	04/05/96	48032	(EPA/ML 245.1)	Mercury	ND	ug/l	0.50	1
	04/04/96	48117	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
04/11/96	04/13/96		(EPA 1613)	2,3,7,8 - TCDD	ND	PGL	1.6	1
			525 Semivolatiles by GC/MS					
04/10/96	04/17/96	48362	(ML/EPA 525.2)	2,4-Dinitrotoluene	ND	ug/l	0.10	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	alpha-Chlordane	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Diazinon	NA	ug/l	0.10	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Acenaphthylene	ND	ug/l	0.10	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Alachlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Aldrin	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Anthracene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Atrazine	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Benz(a)Anthracene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Benzo(a)pyrene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Benzo(b)Fluoranthene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Benzo(g,h,i)Perylene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Benzo(k)Fluoranthene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Di(2-Ethylhexyl)phthalate	ND	ug/l	0.60	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Butylbenzylphthalate	ND	ug/l	0.50	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Bromacil	ND	ug/l	2.0	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Butachlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Caffeine	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Chrysene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Dibenz(a,h)Anthracene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Di-(2-Ethylhexyl)adipate	ND	ug/l	0.60	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Diethylphthalate	ND	ug/l	0.50	1

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Dieldrin	ND	ug/l	0.20	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Dimethylphthalate	ND	ug/l	0.50	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Dimethoate	ND	ug/l	10	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Di-n-Butylphthalate	ND	ug/l	0.50	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Endrin	ND	ug/l	0.10	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Fluorene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	gamma-Chlordane	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Hexachlorobenzene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Hexachlorocyclopentadiene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Heptachlor	ND	ug/l	0.040	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Heptachlor Epoxide	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Indeno(1,2,3,c,d)Pyrene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Isophorone	ND	ug/l	0.50	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Lindane	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Methoxychlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Metribuzin	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Molinate	ND	ug/l	0.20	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Metolachlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	trans-Nonachlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Pentachlorophenol	ND	ug/l	1.0	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Phenanthrene	ND	ug/l	0.020	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Prometryn	ND	ug/l	0.50	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Propachlor	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Pyrene	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Simazine	ND	ug/l	0.050	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Thiobencarb	ND	ug/l	0.20	1
04/10/96	04/17/96	48362	(ML/EPA 525.2)	Trifluralin	ND	ug/l	0.10	1
			(Surrogate)	Perylene-d12	106	% Rec		

AB1803 - EDB and DBCP

04/09/96	04/10/96	48379	(ML/EPA 504)	Dibromochloropropane (DBCP)	ND	ug/l	0.010	1
04/09/96	04/10/96	48379	(ML/EPA 504)	Ethylene Dibromide (EDB)	ND	ug/l	0.010	1
			(Surrogate)	1,2-dibromopropane	107	% Rec		

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
				Aldicarbs				
04/09/96		48177	(ML/EPA 531.1)	3-Hydroxycarbofuran	ND	ug/l	2.0	1
04/09/96		48177	(ML/EPA 531.1)	Aldicarb (Temik)	ND	ug/l	0.50	1
04/09/96		48177	(ML/EPA 531.1)	Aldicarb sulfone	ND	ug/l	0.80	1
04/09/96		48177	(ML/EPA 531.1)	Aldicarb sulfoxide	ND	ug/l	0.50	1
04/09/96		48177	(ML/EPA 531.1)	Baygon	ND	ug/l	2.0	1
04/09/96		48177	(ML/EPA 531.1)	Carbofuran (Furadan)	ND	ug/l	0.90	1
04/09/96		48177	(ML/EPA 531.1)	Carbaryl	ND	ug/l	2.0	1
04/09/96		48177	(ML/EPA 531.1)	Methiocarb	ND	ug/l	2.0	1
04/09/96		48177	(ML/EPA 531.1)	Methomyl	ND	ug/l	1.0	1
04/09/96		48177	(ML/EPA 531.1)	Oxamyl (Vydate)	ND	ug/l	2.0	1
			(Surrogate)	BDHC	102	% Rec		
				Diquat and Paraquat				
04/08/96	04/11/96	48295	(ML/EPA 549)	Diquat	ND	ug/l	0.40	1
04/08/96	04/11/96	48295	(EPA 549)	Paraquat	ND	ug/l	2.0	1
				Herbicides by 515.1				
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4,5-T	ND	ug/l	0.22	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4,5-TP (Silvex)	ND	ug/l	0.22	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4-D	ND	ug/l	0.11	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4-DB	ND	ug/l	2.2	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dichlorprop	ND	ug/l	0.55	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Acifluorfen (qualitative)	ND	ug/l	0.22	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Bentazon	ND	ug/l	0.55	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dalapon (qualitative)	ND	ug/l	1.1	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	3,5-Dichlorobenzoic acid	ND	ug/l	0.66	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	DCPA	ND	ug/l	0.22	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dicamba	ND	ug/l	0.088	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dinoseb	ND	ug/l	0.22	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Pentachlorophenol	ND	ug/l	0.044	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Picloram	ND	ug/l	0.11	1.1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	4-Nitrophenol (qualitative)	ND	ug/l	5.5	1.1
			(Surrogate)	2,4-Dichlorophenylacetic acid	84	% Rec		

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
				ICPMS Metals				
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Arsenic, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Barium, Total, ICAP/MS	ND	ug/l	10	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Beryllium, Total, ICAP/MS	ND	ug/l	1.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Cadmium, Total, ICAP/MS	ND	ug/l	0.50	1
04/15/96	04/15/96	48333	(EPA/MS 200.8)	Chromium, Total, ICAP/MS	7.0	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Copper, Total, ICAP/MS	ND	ug/l	50	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Nickel, Total, ICAP/MS	8.5	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Lead, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Antimony, Total, ICAP/MS	ND	ug/l	2.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Selenium, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Thallium, Total, ICAP/MS	ND	ug/l	1.0	1
				Nitrate by IC as NO3 & N				
	04/04/96	48129	(EPA/ML 300.0)	Nitrate-N by IC	0.2	mg/l	0.10	1
	04/04/96	48129	(ML/EPA 300)	Nitrate	0.88	mg/l	0.44	1
				SDWA Pesticides				
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1016 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1221 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1232 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1242 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1248 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1254 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1260 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Alpha-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Alachlor (Alanex)	ND	ug/l	0.050	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Aldrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Beta-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Chlordane	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Chlorthalonil (Drconil, Bravo)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Delta-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDD	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDE	ND	ug/l	0.010	1

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04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDT	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Dieldrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endrin Aldehyde	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan I (alpha)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan II (beta)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan sulfate	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Heptachlor	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Heptachlor Epoxide	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Lindane (gamma-BHC)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Methoxychlor	ND	ug/l	0.050	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Toxaphene	ND	ug/l	0.50	1
			(Surrogate)	Dibutyl Chlorendate	112	% Rec		
			(Surrogate)	Tetrachloro-m-xylene	104	% Rec		

Volatile Organic Compounds

04/10/96	48288	(ML/EPA 502.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloroethene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2-Dichlorobenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,3-Dichlorobenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	1,4-Dichlorobenzene	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
04/10/96	48288	(ML/EPA 502.2)	2-Chlorotoluene	ND	ug/l	0.50	1

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	04/10/96	48288	(ML/EPA 502.2)	4-Chlorotoluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromodichloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Benzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromochloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromomethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	cis-1,2-Dichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Carbon tetrachloride	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromoform	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloroform	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Dibromochloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dibromo-3-chloropropane	ND	ug/l	1.0	1
	04/10/96	48288	(ML/EPA 502.2)	Dibromoethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dibromoethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Ethylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Isopropylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Methylene chloride	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	m+p-Xylenes	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Naphthalene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	n-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	n-Propylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	o-Xylene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Tetrachloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Styrene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	trans-1,2-Dichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Trichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1

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	04/10/96	48288	(ML/EPA 502.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Toluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Trichlorofluoromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Vinyl chloride	ND	ug/l	0.30	1
			(Surrogate)	Bromofluorobenzene-ELCD	84	% Rec		
			(Surrogate)	Bromofluorobenzene-PID	90	% Rec		
			(Surrogate)	Chlorofluorobenzene-ELCD	92	% Rec		
			(Surrogate)	Chlorofluorobenzene-PID	99	% Rec		

PUKAKI (960404047) Sampled on 04/03/96

04/10/96	04/10/96	48285	(EPA/ML 200.7)	Calcium, Total, ICAP	15	mg/l	5.0	1
	04/13/96	48328	(ML/SM4500-CN F)	Cyanide	ND	mg/l	0.025	1
04/08/96	04/11/96	48296	(ML/EPA 548.1)	Endothall	ND	ug/l	5.0	1
	04/08/96	48094	(EPA/ML 340.2)	Fluoride	ND	mg/l	0.10	1
	04/11/96	48303	(ML/EPA 547)	Glyphosate	ND	ug/l	6.0	1
04/05/96	04/05/96	48032	(EPA/ML 245.1)	Mercury	ND	ug/l	0.50	1
	04/04/96	48121	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
04/11/96	04/13/96		(EPA 1613)	2,3,7,8 - TCDD	ND	PGL	0.87	1

525 Semivolatiles by GC/MS

04/10/96	04/15/96	48362	(ML/EPA 525.2)	2,4-Dinitrotoluene	ND	ug/l	0.10	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	alpha-Chlordane	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Diazinon	NA	ug/l	0.10	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Acenaphthylene	ND	ug/l	0.10	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Alachlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Aldrin	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Anthracene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Atrazine	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Benz(a)Anthracene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Benzo(a)pyrene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Benzo(b)Fluoranthene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Benzo(g,h,i)Perylene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Benzo(k)Fluoranthene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Bis(2-Ethylhexyl)phthalate	ND	ug/l	0.60	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Butylbenzylphthalate	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Bromacil	ND	ug/l	2.0	1

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04/10/96	04/15/96	48362	(ML/EPA 525.2)	Butachlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Caffeine	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Chrysene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Dibenz(a,h)Anthracene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Di-(2-Ethylhexyl)adipate	ND	ug/l	0.60	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Diethylphthalate	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Dieldrin	ND	ug/l	0.20	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Dimethylphthalate	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Dimethoate	ND	ug/l	10	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Di-n-Butylphthalate	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Endrin	ND	ug/l	0.10	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Fluorene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	gamma-Chlordane	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Hexachlorobenzene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Hexachlorocyclopentadiene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Heptachlor	ND	ug/l	0.040	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Heptachlor Epoxide	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Indeno(1,2,3,c,d)Pyrene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Isophorone	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Lindane	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Methoxychlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Metribuzin	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Molinate	ND	ug/l	0.20	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Metolachlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	trans-Nonachlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Pentachlorophenol	ND	ug/l	1.0	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Phenanthrene	ND	ug/l	0.020	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Prometryn	ND	ug/l	0.50	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Propachlor	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Pyrene	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Simazine	ND	ug/l	0.050	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Thiobencarb	ND	ug/l	0.20	1
04/10/96	04/15/96	48362	(ML/EPA 525.2)	Trifluralin	ND	ug/l	0.20	1
			(Surrogate)	Perylene-d12	86	% Rec		

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
				AB1803 - EDB and DBCP				
04/09/96	04/10/96	48379	(ML/EPA 504)	Dibromochloropropane (DBCP)	ND	ug/l	0.010	1
04/09/96	04/10/96	48379	(ML/EPA 504)	Ethylene Dibromide (EDB)	ND	ug/l	0.010	1
			(Surrogate)	1,2-dibromopropane	118	% Rec		
				Aldicarbs				
	04/09/96	48177	(ML/EPA 531.1)	3-Hydroxycarbofuran	ND	ug/l	2.0	1
	04/09/96	48177	(ML/EPA 531.1)	Aldicarb (Temik)	ND	ug/l	0.50	1
	04/09/96	48177	(ML/EPA 531.1)	Aldicarb sulfone	ND	ug/l	0.80	1
	04/09/96	48177	(ML/EPA 531.1)	Aldicarb sulfoxide	ND	ug/l	0.50	1
	04/09/96	48177	(ML/EPA 531.1)	Baygon	ND	ug/l	2.0	1
	04/09/96	48177	(ML/EPA 531.1)	Carbofuran (Furadan)	ND	ug/l	0.90	1
	04/09/96	48177	(ML/EPA 531.1)	Carbaryl	ND	ug/l	2.0	1
	04/09/96	48177	(ML/EPA 531.1)	Methiocarb	ND	ug/l	2.0	1
	04/09/96	48177	(ML/EPA 531.1)	Methomyl	ND	ug/l	1.0	1
	04/09/96	48177	(ML/EPA 531.1)	Oxamyl (Vydate)	ND	ug/l	2.0	1
			(Surrogate)	BDMC	101	% Rec		
				Diquat and Paraquat				
04/08/96	04/11/96	48295	(ML/EPA 549)	Diquat	ND	ug/l	0.40	1
04/08/96	04/11/96	48295	(EPA 549)	Paraquat	ND	ug/l	2.0	1
				Herbicides by 515.1				
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4,5-T	ND	ug/l	0.20	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4,5-TP (Silvex)	ND	ug/l	0.20	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4-D	ND	ug/l	0.10	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	2,4-DB	ND	ug/l	2.0	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dichlorprop	ND	ug/l	0.50	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Acifluorfen (qualitative)	ND	ug/l	0.20	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Bentazon	ND	ug/l	0.50	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dalapon (qualitative)	ND	ug/l	1.0	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	3,5-Dichlorobenzoic acid	ND	ug/l	0.60	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	DCPA	ND	ug/l	0.20	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dicamba	ND	ug/l	0.080	1

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04/09/96	04/12/96	48449	(ML/EPA 515.1)	Dinoseb	ND	ug/l	0.20	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Pentachlorophenol	ND	ug/l	0.040	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	Picloram	ND	ug/l	0.10	1
04/09/96	04/12/96	48449	(ML/EPA 515.1)	4-Nitrophenol (qualitative)	ND	ug/l	5.0	1
			(Surrogate)	2,4-Dichlorophenylacetic acid	74	% Rec		
			ICPMS Metals					
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Arsenic, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Barium, Total, ICAP/MS	ND	ug/l	10	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Beryllium, Total, ICAP/MS	ND	ug/l	1.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Cadmium, Total, ICAP/MS	ND	ug/l	0.50	1
04/15/96	04/15/96	48333	(EPA/MS 200.8)	Chromium, Total, ICAP/MS	11	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Copper, Total, ICAP/MS	ND	ug/l	50	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Nickel, Total, ICAP/MS	24	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Lead, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Antimony, Total, ICAP/MS	ND	ug/l	2.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Selenium, Total, ICAP/MS	ND	ug/l	5.0	1
04/15/96	04/15/96	48333	(EPA/ML 200.8)	Thallium, Total, ICAP/MS	ND	ug/l	1.0	1
			Nitrate by IC as NO3 & N					
	04/04/96	48131	(EPA/ML 300.0)	Nitrate-N by IC	0.2	mg/l	0.10	1
	04/04/96	48131	(ML/EPA 300)	Nitrate	0.88	mg/l	0.44	1
			SDWA Pesticides					
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1016 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1221 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1232 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1242 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1248 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1254 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	PCB 1260 Aroclor	ND	ug/l	0.10	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Alpha-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Alachlor (Alanex)	ND	ug/l	0.050	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Aldrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Beta-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Chlordane	ND	ug/l	0.10	1

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04/08/96	04/21/96	48584	(ML/EPA 508)	Chlorthalonil (Drconil, Bravo)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Delta-BHC	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDD	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDE	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	p,p' DDT	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Dieldrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endrin Aldehyde	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endrin	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan I (alpha)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan II (beta)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Endosulfan sulfate	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Heptachlor	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Heptachlor Epoxide	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Lindane (gamma-BHC)	ND	ug/l	0.010	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Methoxychlor	ND	ug/l	0.050	1
04/08/96	04/21/96	48584	(ML/EPA 508)	Toxaphene	ND	ug/l	0.50	1
			(Surrogate)	Dibutyl Chlorendate	128	% Rec		
			(Surrogate)	Tetrachlorometaxylene	116	% Rec		

Volatile Organic Compounds

	04/10/96	48288	(ML/EPA 502.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dichlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,3-Dichlorobenzene	ND	ug/l	0.50	1

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	04/10/96	48288	(ML/EPA 502.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,4-Dichlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	2-Chlorotoluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	4-Chlorotoluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromodichloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Benzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromochloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromomethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	cis-1,2-Dichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chlorobenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Carbon tetrachloride	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Bromoform	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloroform	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloroethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Chloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Dibromochloromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dibromo-3-chloropropane	ND	ug/l	1.0	1
	04/10/96	48288	(ML/EPA 502.2)	Dibromomethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	1,2-Dibromoethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Ethylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Isopropylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Methylene chloride	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	m+p-Xylenes	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Naphthalene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	n-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	n-Propylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	o-Xylene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Tetrachloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Styrene	ND	ug/l	0.50	1

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	04/10/96	48288	(ML/EPA 502.2)	trans-1,2-Dichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Trichloroethene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 524.2)	Trichlorotrifluoroethane(Freon	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Toluene	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Trichlorofluoromethane	ND	ug/l	0.50	1
	04/10/96	48288	(ML/EPA 502.2)	Vinyl chloride	ND	ug/l	0.30	1
			(Surrogate)	Bromofluorobenzene-ELCD	86	% Rec		
			(Surrogate)	Bromofluorobenzene-PID	96	% Rec		
			(Surrogate)	Chlorofluorobenzene-ELCD	92	% Rec		
			(Surrogate)	Chlorofluorobenzene-PID	99	% Rec		

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QC Batch #48032 Mercury

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Mercury	1.50	1.55	103.333	(85.00 - 115.00)	
LCS2	Mercury	1.50	1.51	100.667	(85.00 - 115.00)	2.6
MBLK	Mercury	ND				
MS	Mercury	1.50	1.62	108.000	(80.00 - 120.00)	
MSD	Mercury	1.50	1.63	108.667	(80.00 - 120.00)	0.62

QC Batch #48094 Fluoride

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Fluoride	0.87	0.85	97.701	(90.00 - 110.00)	
LCS2	Fluoride	0.87	0.89	102.299	(90.00 - 110.00)	4.6
MBLK	Fluoride	ND				
MS	Fluoride	0.909	1.00	110.011	(80.00 - 120.00)	
MSD	Fluoride	0.909	1.01	111.111	(80.00 - 120.00)	1.00

QC Batch #48117 Nitrite, Nitrogen by IC

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Nitrite, Nitrogen by IC	1.0	0.92	92.000	(90.00 - 110.00)	
LCS2	Nitrite, Nitrogen by IC	1.0	0.91	91.000	(90.00 - 110.00)	1.1
MBLK	Nitrite, Nitrogen by IC	ND				
MS	Nitrite, Nitrogen by IC	1.0	0.95	95.000	(80.00 - 120.00)	
MSD	Nitrite, Nitrogen by IC	1.0	0.95	95.000	(80.00 - 120.00)	0.00

QC Batch #48121 Nitrite, Nitrogen by IC

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Nitrite, Nitrogen by IC	1.0	0.91	91.000	(90.00 - 110.00)	
LCS2	Nitrite, Nitrogen by IC	1.0	0.93	93.000	(90.00 - 110.00)	2.2
MBLK	Nitrite, Nitrogen by IC	ND				
MS	Nitrite, Nitrogen by IC	1.0	0.81	81.000	(80.00 - 120.00)	
MSD	Nitrite, Nitrogen by IC	1.0	0.81	81.000	(80.00 - 120.00)	0.00

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QC Batch #48129 Nitrate by IC as NO3 & N

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	Nitrate	ND				
LCS1	Nitrate-N	2.5	2.46	98.400	(90.00 - 110.00)	
LCS2	Nitrate-N	2.5	2.46	98.400	(90.00 - 110.00)	0.00
MS	Nitrate-N	2.5	2.47	98.800	(75.00 - 125.00)	
MSD	Nitrate-N	2.5	2.49	99.600	(75.00 - 125.00)	0.81

QC Batch #48131 Nitrate by IC as NO3 & N

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	Nitrate	ND				
LCS1	Nitrate-N	2.5	2.46	98.400	(90.00 - 110.00)	
LCS2	Nitrate-N	2.5	2.47	98.800	(90.00 - 110.00)	0.41
MS	Nitrate-N	2.5	2.68	107.200	(75.00 - 125.00)	
MSD	Nitrate-N	2.5	2.66	106.400	(75.00 - 125.00)	0.75

QC Batch #48177 Aldicarbs

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	3-Hydroxycarbofuran	20.0	18.4	92.000	(85.00 - 120.00)	
MBLK	3-Hydroxycarbofuran	ND				
MS	3-Hydroxycarbofuran	20.0	19.3	96.500	(70.00 - 130.00)	
LCS1	Aldicarb (Temik)	20.0	20.7	103.500	(83.00 - 115.00)	
MBLK	Aldicarb (Temik)	ND				
MS	Aldicarb (Temik)	20.0	19.8	99.000	(70.00 - 130.00)	
LCS1	Aldicarb sulfone	20.0	19.4	97.000	(84.00 - 128.00)	
MBLK	Aldicarb sulfone	ND				
MS	Aldicarb sulfone	20.0	18.8	94.000	(60.00 - 130.00)	
LCS1	Aldicarb sulfoxide	20.0	18.9	94.500	(85.00 - 138.00)	
MBLK	Aldicarb sulfoxide	ND				
MS	Aldicarb sulfoxide	20.0	18.8	94.000	(70.00 - 130.00)	
LCS1	Baygon	20.0	20.6	103.000	(85.00 - 115.00)	

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MBLK	Baygon	ND				
MS	Baygon	20.0	19.0	95.000	(70.00 - 130.00)	
LCS1	Carbaryl	20.0	17.2	86.000	(85.00 - 119.00)	
MBLK	Carbaryl	ND				
MS	Carbaryl	20.0	21.1	105.500	(70.00 - 130.00)	
LCS1	Carbofuran (Furadan)	20.0	20.4	102.000	(85.00 - 115.00)	
MBLK	Carbofuran (Furadan)	ND				
MS	Carbofuran (Furadan)	20.0	18.7	93.500	(70.00 - 130.00)	
LCS1	Methiocarb	20.0	16.9	84.500	(70.00 - 136.00)	
MBLK	Methiocarb	ND				
MS	Methiocarb	20.0	19.1	95.500	(70.00 - 130.00)	
LCS1	Methomyl	20.0	20.1	100.500	(85.00 - 115.00)	
MBLK	Methomyl	ND				
MS	Methomyl	20.0	18.7	93.500	(70.00 - 130.00)	
LCS1	Oxamyl (Vydate)	20.0	17.8	89.000	(85.00 - 115.00)	
MBLK	Oxamyl (Vydate)	ND				
MS	Oxamyl (Vydate)	20.0	18.2	91.000	(70.00 - 130.00)	

QC Batch #48285 — Calcium, Total, ICAP

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Calcium, Total, ICAP	50	47.7	95.400	(90.00 - 110.00)	
LCS2	Calcium, Total, ICAP	50	49.7	99.400	(90.00 - 110.00)	4.1
MBLK	Calcium, Total, ICAP	ND				
MS	Calcium, Total, ICAP	50	47.8	95.600	(80.00 - 120.00)	
MSD	Calcium, Total, ICAP	50	48.9	97.800	(80.00 - 120.00)	2.3

QC Batch #48288 — Volatile Organic Compounds

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	1,1,1,2-Tetrachloroethane	ND				
LCS1	1,1,1-Trichloroethane	4.0	4.0	100.000	(100.00 - 120.00)	
LCS2	1,1,1-Trichloroethane	4.0	3.9	97.500	(100.00 - 120.00)	2.5
MBLK	1,1,1-Trichloroethane	ND				
MBLK	1,1,2,2-Tetrachloroethane	ND				
MBLK	1,1,2-Trichloroethane	ND				

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MBLK	1,1-Dichloroethane	ND				
MBLK	1,1-Dichloroethene	ND				
MBLK	1,1-Dichloropropene	ND				
LCS1	1,2,3-Trichlorobenzene	4.0	3.7	92.500	(80.00 - 120.00)	
LCS2	1,2,3-Trichlorobenzene	4.0	3.9	97.500	(80.00 - 120.00)	5.3
MBLK	1,2,3-Trichlorobenzene	ND				
MBLK	1,2,3-Trichloropropane	ND				
MBLK	1,2,4-Trichlorobenzene	ND				
MBLK	1,2,4-Trimethylbenzene	ND				
MBLK	1,2-Dichlorobenzene	ND				
MBLK	1,2-Dichloroethane	ND				
MBLK	1,2-Dichloropropane	ND				
MBLK	1,3,5-Trimethylbenzene	ND				
MBLK	1,3-Dichlorobenzene	ND				
MBLK	1,3-Dichloropropane	ND				
MBLK	1,4-Dichlorobenzene	ND				
MBLK	2,2-Dichloropropane	ND				
MBLK	2-Chlorotoluene	ND				
MBLK	4-Chlorotoluene	ND				
LCS1	Benzene	4.0	3.8	95.000	(80.00 - 120.00)	
LCS2	Benzene	4.0	3.9	97.500	(80.00 - 120.00)	2.6
MBLK	Benzene	ND				
MBLK	Bromobenzene	ND				
MBLK	Bromochloromethane	ND				
LCS1	Bromodichloromethane	4.0	3.6	90.000	(80.00 - 120.00)	
LCS2	Bromodichloromethane	4.0	3.5	87.500	(80.00 - 120.00)	2.8
MBLK	Bromodichloromethane	ND				
LCS1	Bromoform	4.0	3.6	90.000	(80.00 - 120.00)	
LCS2	Bromoform	4.0	4.1	102.500	(80.00 - 120.00)	13
MBLK	Bromoform	ND				
MBLK	Bromomethane	ND				
LCS1	Carbon tetrachloride	4.0	3.8	95.000	(80.00 - 120.00)	
LCS2	Carbon tetrachloride	4.0	3.9	97.500	(80.00 - 120.00)	2.6
MBLK	Carbon tetrachloride	ND				
MBLK	Chlorobenzene	ND				
MBLK	Chloroethane	ND				
LCS1	Chloroform	4.0	3.8	95.000	(80.00 - 120.00)	
LCS2	Chloroform	4.0	3.8	95.000	(80.00 - 120.00)	0.00

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MBLK	Chloroform	ND				
MBLK	Chloromethane	ND				
LCS1	Dibromochloroethane	4.0	3.6	90.000	(80.00 - 120.00)	
LCS2	Dibromochloroethane	4.0	4.0	100.000	(80.00 - 120.00)	11
MBLK	Dibromochloromethane	ND				
MBLK	Dibromomethane	ND				
MBLK	Dichlorodifluoromethane	ND				
MBLK	Ethylbenzene	ND				
MBLK	Hexachlorobutadiene	ND				
LCS1	Isopropylbenzene	4.0	3.7	92.500	(80.00 - 120.00)	
LCS2	Isopropylbenzene	4.0	3.8	95.000	(80.00 - 120.00)	2.7
MBLK	Isopropylbenzene	ND				
MBLK	Methylene chloride	ND				
MBLK	Naphthalene	ND				
MBLK	Styrene	ND				
LCS1	Tetrachloroethene	4.0	3.8	95.000	(80.00 - 120.00)	
LCS2	Tetrachloroethene	4.0	3.9	97.500	(80.00 - 120.00)	2.6
MBLK	Tetrachloroethene	ND				
MBLK	Toluene	ND				
LCS1	Trichloroethene	4.0	3.6	90.000	(80.00 - 120.00)	
LCS2	Trichloroethene	4.0	3.7	92.500	(80.00 - 120.00)	2.7
MBLK	Trichloroethene	ND				
MBLK	Trichlorofluoromethane	ND				
MBLK	Trichlorotrifluoroethane(Freon	ND				
MBLK	Vinyl chloride	ND				
MBLK	cis-1,2-Dichloroethene	ND				
MBLK	cis-1,3-Dichloropropene	ND				
MBLK	m-p-Xylenes	ND				
MBLK	n-Butylbenzene	ND				
MBLK	n-Propylbenzene	ND				
MBLK	o-Xylene	ND				
MBLK	p-Isopropyltoluene	ND				
LCS1	sec-Butylbenzene	4.0	3.6	90.000	(80.00 - 120.00)	
LCS2	sec-Butylbenzene	4.0	3.7	92.500	(80.00 - 120.00)	2.7
MBLK	sec-Butylbenzene	ND				
MBLK	tert-Butylbenzene	ND				
LCS1	trans-1,2-Dichloroethene	4.0	3.8	95.000	(80.00 - 120.00)	
LCS2	trans-1,2-Dichloroethene	4.0	3.9	97.500	(80.00 - 120.00)	2.6

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MBLK	trans-1,2-Dichloroethene	ND
MBLK	trans-1,3-Dichloropropene	ND

QC Batch #48295 — Diquat and Paraquat

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Diquat	10.0	9.85	98.500	(70.00 - 130.00)	
MBLK	Diquat	ND				
MS	Diquat	10.0	10.8	108.000	(70.00 - 130.00)	
LCS1	Paraquat	10.0	9.82	98.200	(70.00 - 130.00)	
MBLK	Paraquat	ND				
MS	Paraquat	10.0	10.3	103.000	(70.00 - 130.00)	

QC Batch #48296 — Endothall

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Endothall	25	22.5	90.000	(58.00 - 137.00)	
MBLK	Endothall	ND				
MS	Endothall	25	21.0	84.000	(63.00 - 126.00)	

QC Batch #48301 — Glyphosate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Glyphosate	50	49.5	99.000	(70.00 - 130.00)	
MBLK	Glyphosate	ND				
MS	Glyphosate	50	46.0	92.000	(70.00 - 130.00)	

QC Batch #48303 — Glyphosate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Glyphosate	50	49.5	99.000	(70.00 - 130.00)	
MBLK	Glyphosate	ND				
MS	Glyphosate	50	46.4	92.800	(70.00 - 130.00)	

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QC Batch #48328 Cyanide

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Cyanide	0.10	0.0968	96.800	(90.00 - 110.00)	
MBLK	Cyanide	ND				
MS	Cyanide	0.10	0.0912	91.200	(80.00 - 120.00)	
MSD	Cyanide	0.10	0.0915	91.500	(80.00 - 120.00)	0.33

QC Batch #48333 ICPMS Metals

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Antimony, Total, ICAP/MS	50	45.9	91.800	(85.00 - 115.00)	
MBLK	Antimony, Total, ICAP/MS	ND		0.000		
LCS1	Arsenic, Total, ICAP/MS	20	19.7	98.500	(85.00 - 115.00)	
MBLK	Arsenic, Total, ICAP/MS	ND		0.000		
LCS1	Barium, Total, ICAP/MS	100	100.	100.000	(85.00 - 115.00)	
MBLK	Barium, Total, ICAP/MS	ND		0.000		
LCS1	Beryllium, Total, ICAP/MS	5	4.95	99.000	(85.00 - 115.00)	
MBLK	Beryllium, Total, ICAP/MS	ND		0.000		
LCS1	Cadmium, Total, ICAP/MS	20	20.0	100.000	(85.00 - 115.00)	
MBLK	Cadmium, Total, ICAP/MS	ND		0.000		
LCS1	Chromium, Total, ICAP/MS	100	98.7	98.700	(85.00 - 115.00)	
MBLK	Chromium, Total, ICAP/MS	ND		0.000		
LCS1	Copper, Total, ICAP/MS	100	98.4	98.400	(85.00 - 115.00)	
MBLK	Copper, Total, ICAP/MS	ND		0.000		
LCS1	Lead, Total, ICAP/MS	20	20.5	102.500	(85.00 - 115.00)	
MBLK	Lead, Total, ICAP/MS	ND		0.000		
LCS1	Nickel, Total, ICAP/MS	50	48.7	97.400	(85.00 - 115.00)	
MBLK	Nickel, Total, ICAP/MS	ND		0.000		
LCS1	Selenium, Total, ICAP/MS	20	18.1	90.500	(85.00 - 115.00)	
MBLK	Selenium, Total, ICAP/MS	ND		0.000		
LCS1	Thallium, Total, ICAP/MS	20	19.7	98.500	(85.00 - 115.00)	
MBLK	Thallium, Total, ICAP/MS	ND		0.000		

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QC Batch #48362 525 Semivolatiles by GC/MS

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Acenaphthylene	2	2.05	102.500	(70.00 - 130.00)	
MBLK	Acenaphthylene	ND				
MS	Acenaphthylene	2	1.99	99.500	(70.00 - 130.00)	
LCS1	Alachlor	2	2.21	110.500	(70.00 - 130.00)	
MBLK	Alachlor	ND				
MS	Alachlor	2	2.18	109.000	(70.00 - 130.00)	
LCS1	Aldrin	2	1.93	96.500	(70.00 - 130.00)	
MBLK	Aldrin	ND				
MS	Aldrin	2	1.85	92.500	(70.00 - 130.00)	
LCS1	Anthracene	2	2.00	100.000	(70.00 - 130.00)	
MBLK	Anthracene	ND				
MS	Anthracene	2	1.93	96.500	(70.00 - 130.00)	
LCS1	Atrazine	2	2.11	105.500	(70.00 - 130.00)	
MBLK	Atrazine	ND				
MS	Atrazine	2	2.17	108.500	(70.00 - 130.00)	
LCS1	Benz(a)Anthracene	2	2.06	103.000	(70.00 - 130.00)	
MBLK	Benz(a)Anthracene	ND				
MS	Benz(a)Anthracene	2	1.92	96.000	(70.00 - 130.00)	
LCS1	Benzo(a)pyrene	2	1.97	98.500	(70.00 - 130.00)	
MBLK	Benzo(a)pyrene	ND				
MS	Benzo(a)pyrene	2	1.72	86.000	(70.00 - 130.00)	
LCS1	Benzo(b)Fluoranthene	2	2.06	103.000	(70.00 - 130.00)	
MBLK	Benzo(b)Fluoranthene	ND				
MS	Benzo(b)Fluoranthene	2	1.83	91.500	(70.00 - 130.00)	
LCS1	Benzo(g,h,i)Perylene	2	1.46	73.000	(70.00 - 130.00)	
MBLK	Benzo(g,h,i)Perylene	ND				
MS	Benzo(g,h,i)Perylene	2	1.38	69.000	(70.00 - 130.00)	
LCS1	Benzo(k)Fluoranthene	2	2.16	108.000	(70.00 - 130.00)	
MBLK	Benzo(k)Fluoranthene	ND				
MS	Benzo(k)Fluoranthene	2	1.90	95.000	(70.00 - 130.00)	
MBLK	Bromacil	ND				
MBLK	Butachlor	ND				
LCS1	Butylbenzylphthalate	2	2.41	120.500	(70.00 - 130.00)	

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MBLK	Butylbenzylphthalate	ND			
MS	Butylbenzylphthalate	2	2.19	109.500	(70.00 - 130.00)
LCS1	Caffeine	2	2.11	105.500	(70.00 - 130.00)
MBLK	Caffeine	ND			
MS	Caffeine	2	2.11	105.500	(70.00 - 130.00)
LCS1	Chrysene	2	1.89	94.500	(70.00 - 130.00)
MBLK	Chrysene	ND			
MS	Chrysene	2	1.69	84.500	(70.00 - 130.00)
LCS1	Di(2-Ethylhexyl)phthalate	2	2.25	112.500	(70.00 - 130.00)
MBLK	Di(2-Ethylhexyl)phthalate	ND			
MS	Di(2-Ethylhexyl)phthalate	2	2.38	119.000	(70.00 - 130.00)
LCS1	Di-(2-Ethylhexyl)adipate	2	1.89	94.500	(70.00 - 130.00)
MBLK	Di-(2-Ethylhexyl)adipate	ND			
MS.	Di-(2-Ethylhexyl)adipate	2	1.71	85.500	(70.00 - 130.00)
LCS1	Di-n-Butylphthalate	2	2.12	106.000	(70.00 - 130.00)
MBLK	Di-n-Butylphthalate	ND	0.31 J		
MS	Di-n-Butylphthalate	2	2.07	103.500	(70.00 - 130.00)
MBLK	Diazinon	ND			
LCS1	Dibenz(a,h)Anthracene	2	1.72	86.000	(70.00 - 130.00)
MBLK	Dibenz(a,h)Anthracene	ND			
MS	Dibenz(a,h)Anthracene	2	1.39	69.500	(70.00 - 130.00)
MBLK	Dieldrin	ND			
LCS1	Diethylphthalate	2	2.25	112.500	(70.00 - 130.00)
MBLK	Diethylphthalate	ND			
MS	Diethylphthalate	2	2.11	105.500	(70.00 - 130.00)
MBLK	Dimethoate	ND			
LCS1	Dimethylphthalate	2	2.25	112.500	(70.00 - 130.00)
MBLK	Dimethylphthalate	ND			
MS	Dimethylphthalate	2	2.03	101.500	(70.00 - 130.00)
LCS1	Endrin	2	2.40	120.000	(70.00 - 130.00)
MBLK	Endrin	ND			
MS	Endrin	2	2.12	106.000	(70.00 - 130.00)
LCS1	Fluorene	2	2.18	109.000	(70.00 - 130.00)
MBLK	Fluorene	ND			
MS	Fluorene	2	2.07	103.500	(70.00 - 130.00)
LCS1	Heptachlor	2	1.87	93.500	(70.00 - 130.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	2	2.02	101.000	(70.00 - 130.00)

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LCS1	Heptachlor Epoxide	2	1.98	99.000	(70.00 - 130.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	2	2.01	100.500	(70.00 - 130.00)
LCS1	Hexachlorobenzene	2	1.81	90.500	(70.00 - 130.00)
MBLK	Hexachlorobenzene	ND			
MS	Hexachlorobenzene	2	1.84	92.000	(70.00 - 130.00)
LCS1	Hexachlorocyclopentadiene	2	1.89	94.500	(40.00 - 130.00)
MBLK	Hexachlorocyclopentadiene	ND			
MS	Hexachlorocyclopentadiene	2	1.90	95.000	(40.00 - 130.00)
LCS1	Indeno(1,2,3,c,d)Pyrene	2	1.63	81.500	(70.00 - 130.00)
MBLK	Indeno(1,2,3,c,d)Pyrene	ND			
MS	Indeno(1,2,3,c,d)Pyrene	2	1.39	69.500	(70.00 - 130.00)
MBLK	Isophorone	ND			
LCS1	Lindane	2	2.04	102.000	(70.00 - 130.00)
MBLK	Lindane	ND			
MS	Lindane	2	1.91	95.500	(70.00 - 130.00)
LCS1	Methoxychlor	2	2.37	118.500	(70.00 - 130.00)
MBLK	Methoxychlor	ND			
MS	Methoxychlor	2	2.12	106.000	(70.00 - 130.00)
MBLK	Metolachlor	ND			
MBLK	Metribuzin	ND			
LCS1	Molinate	2	2.20	110.000	(70.00 - 130.00)
MBLK	Molinate	ND			
MS	Molinate	2	2.10	105.000	(70.00 - 130.00)
LCS1	Pentachlorophenol	8	9.84	123.000	(70.00 - 130.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	8	9.36	117.000	(70.00 - 130.00)
LCS1	Phenanthrene	2	2.08	104.000	(70.00 - 130.00)
MBLK	Phenanthrene	ND			
MS	Phenanthrene	2	2.08	104.000	(70.00 - 130.00)
MBLK	Prometryn	ND			
MBLK	Propachlor	ND			
LCS1	Pyrene	2	2.29	114.500	(70.00 - 130.00)
MBLK	Pyrene	ND			
MS	Pyrene	2	2.32	116.000	(70.00 - 130.00)
LCS1	Simazine	2	2.27	113.500	(70.00 - 130.00)
MBLK	Simazine	ND			
MS	Simazine	2	2.29	114.500	(70.00 - 130.00)

. Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

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LCS1	Thiobencarb	2	2.19	109.500	(70.00 - 130.00)
MBLK	Thiobencarb	ND			
MS	Thiobencarb	2	2.10	105.000	(70.00 - 130.00)
MBLK	Trifluralin	ND			
LCS1	alpha-Chlordane	2	2.03	101.500	(70.00 - 130.00)
MBLK	alpha-Chlordane	ND			
MS	alpha-Chlordane	2	1.91	95.500	(70.00 - 130.00)
LCS1	gamma-Chlordane	2	1.97	98.500	(70.00 - 130.00)
MBLK	gamma-Chlordane	ND			
MS	gamma-Chlordane	2	1.80	90.000	(70.00 - 130.00)
LCS1	trans-Nonachlor	2	1.87	93.500	(70.00 - 130.00)
MBLK	trans-Nonachlor	ND			
MS	trans-Nonachlor	2	1.84	92.000	(70.00 - 130.00)

QC Batch #48379 AB1803 - EDB and DBCP

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Dibromochloropropane (DBCP)	ND	ND		(0.00 - 20.00)	
LCS1	Dibromochloropropane (DBCP)	0.10	0.09	90.000	(60.00 - 140.00)	
LCS2	Dibromochloropropane (DBCP)	0.10	0.09	90.000	(60.00 - 140.00)	0.00
MBLK	Dibromochloropropane (DBCP)	ND				
MS	Dibromochloropropane (DBCP)	0.10	0.09	90.000	(60.00 - 140.00)	
DUP	Ethylene Dibromide (EDB)	ND	ND		(0.00 - 20.00)	
LCS1	Ethylene Dibromide (EDB)	0.10	0.10	100.000	(60.00 - 140.00)	
LCS2	Ethylene Dibromide (EDB)	0.10	0.09	90.000	(60.00 - 140.00)	11
MBLK	Ethylene Dibromide (EDB)	ND				
MS	Ethylene Dibromide (EDB)	0.10	0.10	100.000	(60.00 - 140.00)	

QC Batch #48449 Herbicides by 515.1

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	2,4,5-T	ND				
LCS1	2,4,5-TP (Silvex)	0.50	0.50	100.000	(67.00 - 120.00)	
LCS2	2,4,5-TP (Silvex)	0.50	NA		(67.00 - 120.00)	
MBLK	2,4,5-TP (Silvex)	ND				
MS	2,4,5-TP (Silvex)	0.50	0.49	98.000	(42.00 - 226.00)	

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LCS1	2,4-D	1.00	0.83	83.000	(72.00 - 127.00)
LCS2	2,4-D	1.00	NA		(72.00 - 127.00)
MBLK	2,4-D	ND			
MS	2,4-D	1.00	0.77	77.000	(49.00 - 214.00)
MBLK	2,4-DB	ND			
MBLK	3,5-Dichlorobenzoic acid	ND			
MBLK	4-Nitrophenol (qualitative)	ND			
MBLK	Acifluorfen (qualitative)	ND			
LCS1	Bentazon	1.00	0.68	68.000	(75.00 - 134.00)
LCS2	Bentazon	1.00	NA		(75.00 - 134.00)
MBLK	Bentazon	ND			
MS	Bentazon	1.00	0.90	90.000	(70.00 - 170.00)
MBLK	DCPA	ND			
LCS1	Dalapon (qualitative)	6.50	7.85	120.769	(40.00 - 160.00)
LCS2	Dalapon (qualitative)	6.50	NA		(40.00 - 160.00)
MBLK	Dalapon (qualitative)	ND			
MS	Dalapon (qualitative)	6.50	7.67	118.000	(40.00 - 160.00)
LCS1	Dicamba	0.50	0.41	82.000	(38.00 - 232.00)
LCS2	Dicamba	0.50	NA		(38.00 - 232.00)
MBLK	Dicamba	ND			
MS	Dicamba	0.50	0.48	96.000	(38.00 - 232.00)
MBLK	Dichlorprop	ND			
LCS1	Dinoseb	1.00	0.50	50.000	(0.00 - 85.00)
LCS2	Dinoseb	1.00	NA		(0.00 - 85.00)
MBLK	Dinoseb	ND			
MS	Dinoseb	1.00	0.49	49.000	(0.00 - 85.00)
LCS1	Pentachlorophenol	0.50	0.29	58.000	(36.00 - 224.00)
LCS2	Pentachlorophenol	0.50	NA		(36.00 - 224.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	0.50	0.40	80.000	(36.00 - 224.00)
LCS1	Picloram	0.50	0.37	74.000	(45.00 - 138.00)
LCS2	Picloram	0.50	NA		(45.00 - 138.00)
MBLK	Picloram	ND			
MS	Picloram	0.50	0.35	70.000	(45.00 - 138.00)

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Kauai Water Department
(continued)

QC Batch #48584 SDWA Pesticides

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	Alachlor (Alanex)	ND				
LCS1	Aldrin	0.050	0.015	30.000	(59.64 - 145.56)	
LCS2	Aldrin	0.050	NA		(59.64 - 145.56)	
MBLK	Aldrin	ND				
MS	Aldrin	0.050	0.032	64.000	(75.56 - 142.71)	
MBLK	Alpha-BHC	ND				
MBLK	Chlordane	ND				
MBLK	Chlorthalonil (Drconil, Bravo)	ND				
MBLK	Delta-BHC	ND				
LCS1	Dieldrin	0.100	0.105	105.000	(65.75 - 149.79)	
LCS2	Dieldrin	0.100	NA		(65.75 - 149.79)	
MBLK	Dieldrin	ND				
MS	Dieldrin	0.100	0.112	112.000	(77.36 - 141.97)	
MBLK	Endosulfan I (alpha)	ND				
MBLK	Endosulfan II (beta)	ND				
MBLK	Endosulfan sulfate	ND				
LCS1	Endrin	0.100	0.123	123.000	(70.07 - 149.66)	
LCS2	Endrin	0.100	NA		(70.07 - 149.66)	
MBLK	Endrin	ND				
MS	Endrin	0.100	0.127	127.000	(86.46 - 138.80)	
MBLK	Endrin Aldehyde	ND				
LCS1	Gamma-BHC (Lindane)	0.050	0.057	114.000	(81.57 - 148.43)	
LCS2	Gamma-BHC (Lindane)	0.050	NA		(81.57 - 148.43)	
MBLK	Gamma-BHC (Lindane)	ND				
MS	Gamma-BHC (Lindane)	0.050	0.058	116.000	(88.58 - 141.42)	
LCS1	Heptachlor	0.050	0.021	42.000	(60.95 - 145.71)	
LCS2	Heptachlor	0.050	NA		(60.95 - 145.71)	
MBLK	Heptachlor	ND				
MS	Heptachlor	0.050	0.036	72.000	(78.23 - 146.04)	
MBLK	Heptachlor Epoxide	ND				
MBLK	Methoxychlor	ND				
MBLK	PCB 1016 Aroclor	ND				
MBLK	PCB 1221 Aroclor	ND				

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MBLK	PCB 1232 Aroclor	ND			
MBLK	PCB 1242 Aroclor	ND			
MBLK	PCB 1248 Aroclor	ND			
MBLK	PCB 1254 Aroclor	ND			
MBLK	PCB 1260 Aroclor	ND			
MBLK	Toxaphene	ND			
MBLK	p,p' DDD	ND			
MBLK	p,p' DDE	ND			
LCS1	p,p' DDT	0.100	0.109	109.000	(37.03 - 169.44)
LCS2	p,p' DDT	0.100	NA		(37.03 - 169.44)
MBLK	p,p' DDT	ND			
MS	p,p' DDT	0.100	0.117	117.000	(57.41 - 158.86)

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

WATER QUALITY ANALYSES

USGS Northwest
Kilohana Well

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99 MAR 11 AM : 21

Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766

Attention: Wayne Hinazumi
Fax: (808) 245-5813

New Version

HDS Hillary Strayer

Report#: 25316

MONTGOMERY WATSON LABORATORIES

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Report
Comments
#25316

Group Comments

Result for TCDD analysis submitted by Quanterra Environmenta
l Services.
(508) Sample analyzed following a continuing calibration std
which failed high for endosulfan sulfate, methoxychlor and
dibutyl chlorendate surrogate. Reference QIR-GC-96-037.

Report Summary of positive results, PR25316

Analyzed	960131010 NORTHWEST KILOHANA	Result	MDL	UNITS
02/27/96	Data Entry	02/28/96		--
02/15/96	Chromium, Total, ICAP/MS	14	5.000	UGL
01/31/96	Data Entry	02/01/96		--
02/07/96	Di-n-Butylphthalate	0.6	.500	UGL
01/31/96	Nitrate	0.44	.440	MGL
01/31/96	Nitrate-N by IC	0.1	.100	MGL
02/10/96	Data Entry	02/12/96		--
02/07/96	Data Entry	02/28/96		--
02/05/96	Calcium, Flame AA	19	1.000	MGL

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Laboratory
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#25316

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Samples Received
31-jan-1996 12:31:29

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
ORTENEST KILOHANA (960131010) Sampled on 01/30/96								
	02/05/96	45639	(ML/EPA 215.1)	Calcium, Flame AA	19	mg/l	1.0	1
	02/13/96	46059	(ML/SM4500-CN F)	Cyanide	ND	mg/l	0.025	1
02/06/96	02/12/96	46026	(ML/EPA 548.1)	Endothall	ND	ug/l	5.0	1
	02/06/96	45770	(EPA/ML 340.2)	Fluoride	ND	mg/l	0.10	1
	02/05/96	45742	(ML/EPA 547)	Glyphosate	ND	ug/l	6.0	1
02/12/96	02/12/96	45984	(EPA/ML 245.1)	Mercury	ND	ug/l	0.50	1
	01/31/96	45601	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
02/02/96	02/09/96		(EPA 1613)	2,3,7,8 - TCDD	ND	PGL	0.62	1
				525 Semivolatiles by GC/MS				
02/05/96	02/07/96	45867	(ML/EPA 525.2)	2,4-Dinitrotoluene	ND	ug/l	0.10	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	alpha-Chlordane	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Acenaphthylene	ND	ug/l	0.10	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Alachlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Aldrin	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Anthracene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Atrazine	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Benz(a)Anthracene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Benzo(a)pyrene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Benzo(b)Fluoranthene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Benzo(g,h,i)Perylene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Benzo(k)Fluoranthene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Di(2-Ethylhexyl)phthalate	ND	ug/l	0.60	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Butylbenzylphthalate	ND	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Bromacil	ND	ug/l	2.0	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Butachlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Caffeine	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Chrysene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Dibenz(a,h)Anthracene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Di-(2-Ethylhexyl)adipate	ND	ug/l	0.60	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Diethylphthalate	ND	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Dieldrin	ND	ug/l	0.20	1

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Kauai Water Department
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Dimethylphthalate	ND	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Dimethoate	ND	ug/l	10	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Di-n-Butylphthalate	0.6	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Endrin	ND	ug/l	0.10	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Fluorene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	gamma-Chlordane	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Hexachlorobenzene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Hexachlorocyclopentadiene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Heptachlor	ND	ug/l	0.040	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Heptachlor Epoxide	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Indeno(1,2,3,c,d)Pyrene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Isophorone	ND	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Lindane	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Methoxychlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Metribuzin	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Molinate	ND	ug/l	0.20	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Metolachlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	trans-Nonachlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Pentachlorophenol	ND	ug/l	1.0	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Phenanthrene	ND	ug/l	0.020	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Prometryn	ND	ug/l	0.50	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Propachlor	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Pyrene	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Simazine	ND	ug/l	0.050	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Thiobencarb	ND	ug/l	0.20	1
02/05/96	02/07/96	45867	(ML/EPA 525.2)	Trifluralin	ND	ug/l	0.10	1
			(Surrogate)	Perylene-d12	102	% Rec		
			AB1803 - EDB and DBCP					
02/23/96	02/27/96	46560	(ML/EPA 504)	Dibromochloropropane (DBCP)	ND	ug/l	0.010	1
02/23/96	02/27/96	46560	(ML/EPA 504)	Ethylene Dibromide (EDB)	ND	ug/l	0.010	1
			Aldicarbs					
	02/01/96	45562	(ML/EPA 531.1)	3-Hydroxycarbofuran	ND	ug/l	2.0	1
	02/01/96	45562	(ML/EPA 531.1)	Aldicarb (Temik)	ND	ug/l	0.50	1
	02/01/96	45562	(ML/EPA 531.1)	Aldicarb sulfone	ND	ug/l	0.80	1

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Kauai Water Department
(continued)

epared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	02/01/96	45562	(ML/EPA 531.1)	Aldicarb sulfoxide	ND	ug/l	0.50	1
	02/01/96	45562	(ML/EPA 531.1)	Baygon	ND	ug/l	2.0	1
	02/01/96	45562	(ML/EPA 531.1)	Carbofuran (Furadan)	ND	ug/l	0.90	1
	02/01/96	45562	(ML/EPA 531.1)	Carbaryl	ND	ug/l	2.0	1
	02/01/96	45562	(ML/EPA 531.1)	Methiocarb	ND	ug/l	2.0	1
	02/01/96	45562	(ML/EPA 531.1)	Methomyl	ND	ug/l	1.0	1
	02/01/96	45562	(ML/EPA 531.1)	Oxamyl (Vydate)	ND	ug/l	2.0	1
			(Surrogate)	BDMC	100	% Rec		
			Diquat and Paraquat					
:/06/96	02/08/96	45863	(ML/EPA 549)	Diquat	ND	ug/l	0.40	1
:/06/96	02/08/96	45863	(EPA 549)	Paraquat	ND	ug/l	2.0	1
			Herbicides by 515.1					
2/08/96	02/10/96	46008	(ML/EPA 515.1)	2,4,5-T	ND	ug/l	0.20	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	2,4,5-TP (Silvex)	ND	ug/l	0.20	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	2,4-D	ND	ug/l	0.10	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	2,4-DB	ND	ug/l	2.0	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Dichlorprop	ND	ug/l	0.50	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Acifluorfen (qualitative)	ND	ug/l	0.20	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Bentazon	ND	ug/l	0.50	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Dalapon (qualitative)	ND	ug/l	1.0	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	3,5-Dichlorobenzoic acid	ND	ug/l	0.60	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	DCPA	ND	ug/l	0.20	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Dicamba	ND	ug/l	0.080	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Dinoseb	ND	ug/l	0.20	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Pentachlorophenol	ND	ug/l	0.040	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	Picloram	ND	ug/l	0.10	1
2/08/96	02/10/96	46008	(ML/EPA 515.1)	4-Nitrophenol (qualitative)	ND	ug/l	5.0	1
			(Surrogate)	2,4-Dichlorophenylacetic acid	105	% Rec		
			ICPMS Metals					
	02/15/96	46622	(EPA/ML 200.8)	Arsenic, Total, ICAP/MS	ND	ug/l	5.0	1
	02/15/96	46622	(EPA/ML 200.8)	Barium, Total, ICAP/MS	ND	ug/l	10	1
	02/15/96	46622	(EPA/ML 200.8)	Beryllium, Total, ICAP/MS	ND	ug/l	1.0	1
	02/15/96	46622	(EPA/ML 200.8)	Cadmium, Total, ICAP/MS	ND	ug/l	0.50	1

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repared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	02/15/96	46622	(EPA/MS 200.8)	Chromium, Total, ICAP/MS	14	ug/l	5.0	1
	02/15/96	46622	(EPA/ML 200.8)	Copper, Total, ICAP/MS	ND	ug/l	50	1
	02/15/96	46622	(EPA/ML 200.8)	Nickel, Total, ICAP/MS	ND	ug/l	5.0	1
	02/15/96	46622	(EPA/ML 200.8)	Lead, Total, ICAP/MS	ND	ug/l	5.0	1
	02/15/96	46622	(EPA/ML 200.8)	Antimony, Total, ICAP/MS	ND	ug/l	2.0	1
	02/15/96	46622	(EPA/ML 200.8)	Selenium, Total, ICAP/MS	ND	ug/l	5.0	1
	02/15/96	46622	(EPA/ML 200.8)	Thallium, Total, ICAP/MS	ND	ug/l	1.0	1
				Nitrate by IC as NO3 & N				
	01/31/96	45604	(EPA/ML 300.0)	Nitrate-N by IC	0.1	mg/l	0.10	1
	01/31/96	45604	(ML/EPA 300)	Nitrate	0.44	mg/l	0.44	1
				SDWA Pesticides				
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1016 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1221 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1232 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1242 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1248 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1254 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	PCB 1260 Aroclor	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Alpha-BHC	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Alachlor (Alanex)	ND	ug/l	0.050	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Aldrin	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Beta-BHC	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Chlordane	ND	ug/l	0.10	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Chlorthalonil (Orconil, Bravo)	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Delta-BHC	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	p,p' DDD	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	p,p' DDE	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	p,p' DDT	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Dieldrin	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Endrin Aldehyde	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Endrin	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Endosulfan I (alpha)	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Endosulfan II (beta)	ND	ug/l	0.010	1
2/02/96	02/07/96	46568	(ML/EPA 508)	Endosulfan sulfate	ND	ug/l	0.010	1

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
02/02/96	02/07/96	46568	(ML/EPA 508)	Heptachlor	ND	ug/l	0.010	1
02/02/96	02/07/96	46568	(ML/EPA 508)	Heptachlor Epoxide	ND	ug/l	0.010	1
02/02/96	02/07/96	46568	(ML/EPA 508)	Lindane (gamma-BHC)	ND	ug/l	0.010	1
02/02/96	02/07/96	46568	(ML/EPA 508)	Methoxychlor	ND	ug/l	0.050	1
02/02/96	02/07/96	46568	(ML/EPA 508)	Toxaphene	ND	ug/l	0.50	1
			(Surrogate)	Dibutyl Chlorendate	116	% Rec		
			(Surrogate)	Tetrachlorometaxylene	98	% Rec		
				Volatile Organic Compounds				
	01/31/96	45547	(ML/EPA 502.2)	1,1,1,2-Tetrachloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1,1-Trichloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1,2,2-Tetrachloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1,2-Trichloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1-Dichloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1-Dichloroethene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,1-Dichloropropene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2,3-Trichloropropane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2,3-Trichlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2,4-Trichlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2,4-Trimethylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2-Dichloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2-Dichlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2-Dichloropropane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,3,5-Trimethylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,3-Dichlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,3-Dichloropropane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,4-Dichlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	2,2-Dichloropropane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	2-Chlorotoluene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	4-Chlorotoluene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Bromodichloromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Benzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Bromobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Bromochloromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Bromomethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	cis-1,2-Dichloroethene	ND	ug/l	0.50	1

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Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	01/31/96	45547	(ML/EPA 502.2)	Chlorobenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Carbon tetrachloride	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	cis-1,3-Dichloropropene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Bromoform	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Chloroform	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Chloroethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Chloromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Dibromochloromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2-Dibromo-3-chloropropane	ND	ug/l	1.0	1
	01/31/96	45547	(ML/EPA 502.2)	Dibromomethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Dichlorodifluoromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	1,2-Dibromoethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Ethylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Hexachlorobutadiene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Isopropylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Methylene chloride	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	m+p-Xylenes	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Naphthalene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	n-Butylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	n-Propylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	o-Xylene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Tetrachloroethene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	p-Isopropyltoluene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	sec-Butylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Styrene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	trans-1,2-Dichloroethene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	tert-Butylbenzene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Trichloroethene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	trans-1,3-Dichloropropene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Toluene	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Trichlorofluoromethane	ND	ug/l	0.50	1
	01/31/96	45547	(ML/EPA 502.2)	Vinyl chloride	ND	ug/l	0.40	1
			(Surrogate)	Bromofluorobenzene-ELCD	87	% Rec		
			(Surrogate)	Bromofluorobenzene-PID	93	% Rec		
			(Surrogate)	Chlorofluorobenzene-ELCD	92	% Rec		
			(Surrogate)	Chlorofluorobenzene-PID	97	% Rec		

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pared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution

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QC Batch #45547 Volatile Organic Compounds

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	1,1,1,2-Tetrachloroethane	ND				
MBLK	1,1,1-Trichloroethane	ND				
MBLK	1,1,2,2-Tetrachloroethane	ND				
MBLK	1,1,2-Trichloroethane	ND				
MBLK	1,1-Dichloroethane	ND				
MBLK	1,1-Dichloroethene	ND				
MBLK	1,1-Dichloropropene	ND				
LCS1	1,2,3-Trichlorobenzene	10.0	10.2	102.000	(80.00 - 120.00)	
LCS2	1,2,3-Trichlorobenzene	10.0	10.5	105.000	(80.00 - 120.00)	2.9
MBLK	1,2,3-Trichlorobenzene	ND				
MBLK	1,2,3-Trichloropropane	ND				
MBLK	1,2,4-Trichlorobenzene	ND				
MBLK	1,2,4-Trimethylbenzene	ND				
MBLK	1,2-Dichlorobenzene	ND				
MBLK	1,2-Dichloroethane	ND				
MBLK	1,2-Dichloropropane	ND				
MBLK	1,3,5-Trimethylbenzene	ND				
MBLK	1,3-Dichlorobenzene	ND				
MBLK	1,3-Dichloropropane	ND				
MBLK	1,4-Dichlorobenzene	ND				
MBLK	2,2-Dichloropropane	ND				
MBLK	2-Chlorotoluene	ND				
MBLK	4-Chlorotoluene	ND				
LCS1	Benzene	10.0	9.7	97.000	(80.00 - 120.00)	
LCS2	Benzene	10.0	9.8	98.000	(80.00 - 120.00)	1.0
MBLK	Benzene	ND				
MBLK	Bromobenzene	ND				
MBLK	Bromochloromethane	ND				
MBLK	Bromodichloromethane	ND				
MBLK	Bromoform	ND				
MBLK	Bromomethane	ND				
MBLK	Carbon tetrachloride	ND				
MBLK	Chlorobenzene	ND				
MBLK	Chloroethane	ND				
MBLK	Chloroform	ND				
MBLK	Chloromethane	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

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MBLK	Dibromochloromethane	ND				
MBLK	Dibromomethane	ND				
MBLK	Dichlorodifluoromethane	ND				
MBLK	Ethylbenzene	ND				
MBLK	Hexachlorobutadiene	ND				
LCS1	Isopropylbenzene	10.0	9.6	96.000	(80.00 - 120.00)	
LCS2	Isopropylbenzene	10.0	9.8	98.000	(80.00 - 120.00)	2.1
MBLK	Isopropylbenzene	ND				
MBLK	Methylene chloride	ND				
MBLK	Naphthalene	ND				
MBLK	Styrene	ND				
LCS1	Tetrachloroethene	10.0	9.2	92.000	(80.00 - 120.00)	
LCS2	Tetrachloroethene	10.0	8.9	89.000	(80.00 - 120.00)	3.3
MBLK	Tetrachloroethene	ND				
MBLK	Toluene	ND				
MBLK	Trichloroethene	ND				
MBLK	Trichlorofluoromethane	ND				
MBLK	Vinyl chloride	ND				
MBLK	cis-1,2-Dichloroethene	ND				
MBLK	cis-1,3-Dichloropropene	ND				
MBLK	m+p-Xylenes	ND				
MBLK	n-Butylbenzene	ND				
MBLK	n-Propylbenzene	ND				
MBLK	o-Xylene	ND				
MBLK	p-Isopropyltoluene	ND				
LCS1	sec-Butylbenzene	10.0	9.5	95.000	(80.00 - 120.00)	
LCS2	sec-Butylbenzene	10.0	9.8	98.000	(80.00 - 120.00)	3.1
MBLK	sec-Butylbenzene	ND				
MBLK	tert-Butylbenzene	ND				
LCS1	trans-1,2-Dichloroethene	10.0	10.0	100.000	(80.00 - 120.00)	
LCS2	trans-1,2-Dichloroethene	10.0	10.2	102.000	(80.00 - 120.00)	2.0
MBLK	trans-1,2-Dichloroethene	ND				
MBLK	trans-1,3-Dichloropropene	ND				

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(continued)

QC Batch #45562

Aldicarbs

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	3-Hydroxycarbofuran	20.0	20.9	104.500	(85.00 - 120.00)	
MBLK	3-Hydroxycarbofuran	ND				
MS	3-Hydroxycarbofuran	20.0	21.8	109.000	(70.00 - 130.00)	
LCS1	Aldicarb (Temik)	20.0	18.5	92.500	(83.00 - 115.00)	
MBLK	Aldicarb (Temik)	ND				
MS	Aldicarb (Temik)	20.0	21.0	105.000	(70.00 - 130.00)	
LCS1	Aldicarb sulfone	20.0	22.3	111.500	(84.00 - 128.00)	
MBLK	Aldicarb sulfone	ND				
MS	Aldicarb sulfone	20.0	21.3	106.500	(60.00 - 130.00)	
LCS1	Aldicarb sulfoxide	20.0	20.8	104.000	(85.00 - 138.00)	
MBLK	Aldicarb sulfoxide	ND				
MS	Aldicarb sulfoxide	20.0	21.4	107.000	(70.00 - 130.00)	
LCS1	Baygon	20.0	23.0	115.000	(85.00 - 115.00)	
MBLK	Baygon	ND				
MS	Baygon	20.0	21.5	107.500	(70.00 - 130.00)	
LCS1	Carbaryl	20.0	17.6	88.000	(85.00 - 119.00)	
MBLK	Carbaryl	ND				
MS	Carbaryl	20.0	20.9	104.500	(70.00 - 130.00)	
LCS1	Carbofuran (Furadan)	20.0	22.9	114.500	(85.00 - 115.00)	
MBLK	Carbofuran (Furadan)	ND				
MS	Carbofuran (Furadan)	20.0	21.6	108.000	(70.00 - 130.00)	
LCS1	Methiocarb	20.0	16.2	81.000	(70.00 - 136.00)	
MBLK	Methiocarb	ND				
MS	Methiocarb	20.0	20.4	102.000	(70.00 - 130.00)	
LCS1	Methomyl	20.0	22.5	112.500	(85.00 - 115.00)	
MBLK	Methomyl	ND				
MS	Methomyl	20.0	20.9	104.500	(70.00 - 130.00)	
LCS1	Oxamyl (Vydate)	20.0	21.3	106.500	(85.00 - 115.00)	
MBLK	Oxamyl (Vydate)	ND				
MS	Oxamyl (Vydate)	20.0	21.4	107.000	(70.00 - 130.00)	

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QC Batch #45601 — Nitrite, Nitrogen by IC

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Nitrite, Nitrogen by IC	1.0	0.91	91.000	(90.00 - 110.00)	
LCS2	Nitrite, Nitrogen by IC	1.0	0.93	93.000	(90.00 - 110.00)	2.2
MBLK	Nitrite, Nitrogen by IC	ND				
MS	Nitrite, Nitrogen by IC	1.0	0.84	84.000	(80.00 - 120.00)	
MSD	Nitrite, Nitrogen by IC	1.0	0.84	84.000	(80.00 - 120.00)	0.00

QC Batch #45604 — Nitrate by IC as NO3 & N

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	Nitrate	ND				
LCS1	Nitrate-N	2.5	2.52	100.800	(90.00 - 110.00)	
LCS2	Nitrate-N	2.5	2.53	101.200	(90.00 - 110.00)	0.40
MS	Nitrate-N	2.5	2.64	105.600	(75.00 - 125.00)	
MSD	Nitrate-N	2.5	2.64	105.600	(75.00 - 125.00)	0.00

QC Batch #45639 — Calcium, Flame AA

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Calcium, Flame AA	50	48.3	96.600	(90.00 - 110.00)	
LCS2	Calcium, Flame AA	50	48.3	96.600	(90.00 - 110.00)	0.00
MBLK	Calcium, Flame AA	ND				
MS	Calcium, Flame AA	50	49.6	99.200	(80.00 - 120.00)	
MSD	Calcium, Flame AA	50	45.8	91.600	(80.00 - 120.00)	8.0

QC Batch #45742 — Glyphosate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Glyphosate	50	53	106.000	(70.00 - 130.00)	
MBLK	Glyphosate	ND				
MS	Glyphosate	50	54	108.000	(70.00 - 130.00)	

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QC Batch #45770 Fluoride

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Fluoride	0.87	0.88	101.149	(90.00 - 110.00)	
LCS2	Fluoride	0.87	0.88	101.149	(90.00 - 110.00)	0.00
MBLK	Fluoride	ND				
MS	Fluoride	0.909	0.995	109.461	(80.00 - 120.00)	
MSD	Fluoride	0.909	0.982	108.031	(80.00 - 120.00)	1.3

QC Batch #45863 Diquat and Paraquat

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Diquat	10.0	12.9	129.000	(70.00 - 130.00)	
MBLK	Diquat	ND				
MS	Diquat	10.0	10.8	108.000	(70.00 - 130.00)	
LCS1	Paraquat	10.0	12.6	126.000	(70.00 - 130.00)	
MBLK	Paraquat	ND				
MS	Paraquat	10.0	10.4	104.000	(70.00 - 130.00)	

QC Batch #45867 525 Semivolatiles by GC/MS

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Acenaphthylene	2	2.03	101.500	(70.00 - 130.00)	
MBLK	Acenaphthylene	ND				
MS	Acenaphthylene	2	1.93	96.500	(70.00 - 130.00)	
LCS1	Alachlor	2	2.03	101.500	(70.00 - 130.00)	
MBLK	Alachlor	ND				
MS	Alachlor	2	1.99	99.500	(70.00 - 130.00)	
LCS1	Aldrin	2	1.74	87.000	(70.00 - 130.00)	
MBLK	Aldrin	ND				
MS	Aldrin	2	1.74	87.000	(70.00 - 130.00)	
LCS1	Anthracene	2	2.00	100.000	(70.00 - 130.00)	
MBLK	Anthracene	ND				
MS	Anthracene	2	1.93	96.500	(70.00 - 130.00)	

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LCS1	Atrazine	Z	1.98	99.000	(70.00 - 130.00)
MBLK	Atrazine	ND			
MS	Atrazine	Z	2.00	100.000	(70.00 - 130.00)
LCS1	Benz(a)Anthracene	Z	1.92	96.000	(70.00 - 130.00)
MBLK	Benz(a)Anthracene	ND			
MS	Benz(a)Anthracene	Z	1.69	84.500	(70.00 - 130.00)
LCS1	Benzo(a)pyrene	Z	1.95	97.500	(70.00 - 130.00)
MBLK	Benzo(a)pyrene	ND			
MS	Benzo(a)pyrene	Z	1.74	87.000	(70.00 - 130.00)
LCS1	Benzo(b)Fluoranthene	Z	1.95	97.500	(70.00 - 130.00)
MBLK	Benzo(b)Fluoranthene	ND			
MS	Benzo(b)Fluoranthene	Z	1.73	86.500	(70.00 - 130.00)
LCS1	Benzo(g,h,i)Perylene	Z	2.19	109.500	(70.00 - 130.00)
MBLK	Benzo(g,h,i)Perylene	ND			
MS	Benzo(g,h,i)Perylene	Z	2.03	101.500	(70.00 - 130.00)
LCS1	Benzo(k)Fluoranthene	Z	2.09	104.500	(70.00 - 130.00)
MBLK	Benzo(k)Fluoranthene	ND			
MS	Benzo(k)Fluoranthene	Z	1.89	94.500	(70.00 - 130.00)
MBLK	Bromacil	ND			
MBLK	Butachlor	ND			
LCS1	Butylbenzylphthalate	Z	1.87	93.500	(70.00 - 130.00)
MBLK	Butylbenzylphthalate	ND			
MS	Butylbenzylphthalate	Z	1.72	86.000	(70.00 - 130.00)
LCS1	Caffeine	Z	1.78	89.000	(70.00 - 130.00)
MBLK	Caffeine	ND			
MS	Caffeine	Z	2.05	102.500	(70.00 - 130.00)
LCS1	Chrysene	Z	1.81	90.500	(70.00 - 130.00)
MBLK	Chrysene	ND			
MS	Chrysene	Z	1.62	81.000	(70.00 - 130.00)
LCS1	Di(2-Ethylhexyl)phthalate	Z	1.92	96.000	(70.00 - 130.00)
MBLK	Di(2-Ethylhexyl)phthalate	ND			
MS	Di(2-Ethylhexyl)phthalate	Z	1.80	90.000	(70.00 - 130.00)
LCS1	Di-(2-Ethylhexyl)adipate	Z	1.84	92.000	(70.00 - 130.00)
MBLK	Di-(2-Ethylhexyl)adipate	ND			
MS	Di-(2-Ethylhexyl)adipate	Z	1.71	85.500	(70.00 - 130.00)
LCS1	Di-n-Butylphthalate	Z	2.46	123.000	(70.00 - 130.00)
MBLK	Di-n-Butylphthalate	ND			
MS	Di-n-Butylphthalate	Z	2.00	100.000	(70.00 - 130.00)

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MBLK	Diazinon	ND			
LCS1	Dibenz(a,h)Anthracene	2	2.08	104.000	(70.00 - 130.00)
MBLK	Dibenz(a,h)Anthracene	ND			
MS	Dibenz(a,h)Anthracene	2	1.90	95.000	(70.00 - 130.00)
MBLK	Dieldrin	ND			
LCS1	Diethylphthalate	2	2.25	112.500	(70.00 - 130.00)
MBLK	Diethylphthalate	ND			
MS	Diethylphthalate	2	2.25	112.500	(70.00 - 130.00)
MBLK	Dimethoate	ND			
LCS1	Dimethylphthalate	2	1.99	99.500	(70.00 - 130.00)
MBLK	Dimethylphthalate	ND			
MS	Dimethylphthalate	2	1.93	96.500	(70.00 - 130.00)
LCS1	Endrin	2	1.91	95.500	(70.00 - 130.00)
MBLK	Endrin	ND			
MS	Endrin	2	1.69	84.500	(70.00 - 130.00)
LCS1	Fluorene	2	2.05	102.500	(70.00 - 130.00)
MBLK	Fluorene	ND			
MS	Fluorene	2	1.98	99.000	(70.00 - 130.00)
LCS1	Heptachlor	2	1.98	99.000	(70.00 - 130.00)
MBLK	Heptachlor	ND			
MS	Heptachlor	2	2.02	101.000	(70.00 - 130.00)
LCS1	Heptachlor Epoxide	2	1.85	92.500	(70.00 - 130.00)
MBLK	Heptachlor Epoxide	ND			
MS	Heptachlor Epoxide	2	1.88	94.000	(70.00 - 130.00)
LCS1	Hexachlorobenzene	2	1.78	89.000	(70.00 - 130.00)
MBLK	Hexachlorobenzene	ND			
MS	Hexachlorobenzene	2	1.67	83.500	(70.00 - 130.00)
LCS1	Hexachlorocyclopentadiene	2	1.88	94.000	(40.00 - 130.00)
MBLK	Hexachlorocyclopentadiene	ND			
MS	Hexachlorocyclopentadiene	2	1.92	96.000	(40.00 - 130.00)
LCS1	Indeno(1,2,3,c,d)Pyrene	2	2.04	102.000	(70.00 - 130.00)
MBLK	Indeno(1,2,3,c,d)Pyrene	ND			
MS	Indeno(1,2,3,c,d)Pyrene	2	1.87	93.500	(70.00 - 130.00)
MBLK	Isophorone	ND			
LCS1	Lindane	2	2.06	103.000	(70.00 - 130.00)
MBLK	Lindane	ND			
MS	Lindane	2	1.99	99.500	(70.00 - 130.00)
LCS1	Methoxychlor	2	2.11	105.500	(70.00 - 130.00)

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MBLK	Methoxychlor	ND			
MS	Methoxychlor	2	1.92	96.000	(70.00 - 130.00)
MBLK	Metolachlor	ND			
MBLK	Metribuzin	ND			
LCS1	Molinate	2	2.23	111.500	(70.00 - 130.00)
MBLK	Molinate	ND			
MS	Molinate	2	2.06	103.000	(70.00 - 130.00)
LCS1	Pentachlorophenol	8	7.90	98.750	(70.00 - 130.00)
MBLK	Pentachlorophenol	ND			
MS	Pentachlorophenol	8	8.09	101.125	(70.00 - 130.00)
LCS1	Phenanthrene	2	1.99	99.500	(70.00 - 130.00)
MBLK	Phenanthrene	ND			
MS	Phenanthrene	2	1.92	96.000	(70.00 - 130.00)
MBLK	Prometryn	ND			
MBLK	Propachlor	ND			
LCS1	Pyrene	2	1.88	94.000	(70.00 - 130.00)
MBLK	Pyrene	ND			
MS	Pyrene	2	1.88	94.000	(70.00 - 130.00)
LCS1	Simazine	2	1.92	96.000	(70.00 - 130.00)
MBLK	Simazine	ND			
MS	Simazine	2	1.95	97.500	(70.00 - 130.00)
LCS1	Thiobencarb	2	2.06	103.000	(70.00 - 130.00)
MBLK	Thiobencarb	ND			
MS	Thiobencarb	2	1.92	96.000	(70.00 - 130.00)
MBLK	Trifluralin	ND			
LCS1	alpha-Chlordane	2	1.89	94.500	(70.00 - 130.00)
MBLK	alpha-Chlordane	ND			
MS	alpha-Chlordane	2	1.78	89.000	(70.00 - 130.00)
LCS1	gamma-Chlordane	2	1.78	89.000	(70.00 - 130.00)
MBLK	gamma-Chlordane	ND			
MS	gamma-Chlordane	2	1.72	86.000	(70.00 - 130.00)
LCS1	trans-Nonachlor	2	1.81	90.500	(70.00 - 130.00)
MBLK	trans-Nonachlor	ND			
MS	trans-Nonachlor	2	1.86	93.000	(70.00 - 130.00)

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QC Batch #45984

Mercury

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Mercury	1.50	1.37	91.333	(85.00 - 115.00)	
LCS2	Mercury	1.50	1.37	91.333	(85.00 - 115.00)	0.00
MBLK	Mercury	ND				
MS	Mercury	1.50	1.45	96.667	(85.00 - 115.00)	
MSD	Mercury	1.50	1.36	90.667	(85.00 - 115.00)	6.4

QC Batch #46008

Herbicides by 515.1

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	2,4,5-T	ND				
LCS1	2,4,5-TP (Silvex)	0.500	0.53	106.000	(67.00 - 120.00)	
LCS2	2,4,5-TP (Silvex)	0.500	NA		(67.00 - 120.00)	
MBLK	2,4,5-TP (Silvex)	ND				
MS	2,4,5-TP (Silvex)	0.500	0.52	104.000	(42.00 - 226.00)	
LCS1	2,4-D	1.00	0.94	94.000	(72.00 - 127.00)	
LCS2	2,4-D	1.00	NA		(72.00 - 127.00)	
MBLK	2,4-D	ND				
MS	2,4-D	1.00	0.91	91.000	(49.00 - 214.00)	
MBLK	2,4-DB	ND				
MBLK	3,5-Dichlorobenzoic acid	ND				
MBLK	4-Nitrophenol (qualitative)	ND				
MBLK	5-Hydroxydicamba	ND				
MBLK	Acifluorfen (qualitative)	ND				
LCS1	Bentazon	1.00	0.94	94.000	(75.00 - 134.00)	
LCS2	Bentazon	1.00	NA		(75.00 - 134.00)	
MBLK	Bentazon	ND				
MS	Bentazon	1.00	0.95	95.000	(70.00 - 170.00)	
MBLK	Chloramben (qualitative)	ND				
MBLK	DCPA	ND				
MBLK	Dalapon (qualitative)	ND				
MBLK	Dicamba	ND				
MBLK	Dichlorprop	ND				

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MBLK	Dinoseb	ND
MBLK	Pentachlorophenol	ND
MBLK	Picloram	ND

QC Batch #46026 — Endothall

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Endothall	25	29.9	119.600	(58.00 - 137.00)	
MBLK	Endothall	ND				
MS	Endothall	25	26.0	104.000	(63.00 - 126.00)	

QC Batch #46059 — Cyanide

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Cyanide	0.10	0.0936	93.600	(90.00 - 110.00)	
MBLK	Cyanide	ND				
MS	Cyanide	0.10	0.0946	94.600	(80.00 - 120.00)	
MSD	Cyanide	0.10	0.0919	91.900	(80.00 - 120.00)	2.9

QC Batch #46560 — AB1803 - EDB and DBCP

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
DUP	Dibromochloropropane (DBCP)	ND	NA		(60.00 - 140.00)	
LCS1	Dibromochloropropane (DBCP)	0.10	0.11	110.000	(60.00 - 140.00)	
LCS2	Dibromochloropropane (DBCP)	0.10	0.11	110.000	(60.00 - 140.00)	0.00
MBLK	Dibromochloropropane (DBCP)	ND				
MS	Dibromochloropropane (DBCP)	0.10	NA		(60.00 - 140.00)	
DUP	Ethylene Dibromide (EDB)	ND	NA		(60.00 - 140.00)	
LCS1	Ethylene Dibromide (EDB)	0.10	0.10	100.000	(60.00 - 140.00)	
LCS2	Ethylene Dibromide (EDB)	0.10	0.10	100.000	(60.00 - 140.00)	0.00
MBLK	Ethylene Dibromide (EDB)	ND				
MS	Ethylene Dibromide (EDB)	0.10	NA		(60.00 - 140.00)	

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QC Batch #46568

SDWA Pesticides

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MBLK	Alachlor (Alanex)	ND				
LCS1	Aldrin	0.050	0.047	94.000	(56.00 - 116.00)	
LCS2	Aldrin	0.050	NA		(56.00 - 116.00)	
MBLK	Aldrin	ND				
MS	Aldrin	0.050	0.051	102.000	(56.00 - 116.00)	
MBLK	Alpha-BHC	ND				
MBLK	Chlordane	ND				
MBLK	Chlorthalonil (Dreonil, Bravo)	ND				
MBLK	Delta-BHC	ND				
LCS1	Dieldrin	0.100	0.111	111.000	(57.00 - 117.00)	
LCS2	Dieldrin	0.100	NA		(57.00 - 117.00)	
MBLK	Dieldrin	ND				
MS	Dieldrin	0.100	0.111	111.000	(57.00 - 117.00)	
MBLK	Endosulfan I (alpha)	ND				
MBLK	Endosulfan II (beta)	ND				
MBLK	Endosulfan sulfate	ND				
LCS1	Endrin	0.100	0.115	115.000	(58.00 - 118.00)	
LCS2	Endrin	0.100	NA		(58.00 - 118.00)	
MBLK	Endrin	ND				
MS	Endrin	0.100	0.116	116.000	(58.00 - 118.00)	
MBLK	Endrin Aldehyde	ND				
LCS1	Gamma-BHC (Lindane)	0.050	0.053	106.000	(59.00 - 119.00)	
LCS2	Gamma-BHC (Lindane)	0.050	NA		(59.00 - 119.00)	
MBLK	Gamma-BHC (Lindane)	ND				
MS	Gamma-BHC (Lindane)	0.050	0.054	108.000	(59.00 - 119.00)	
LCS1	Heptachlor	0.050	0.049	98.000	(63.00 - 133.00)	
LCS2	Heptachlor	0.050	NA		(63.00 - 133.00)	
MBLK	Heptachlor	ND				
MS	Heptachlor	0.050	0.052	104.000	(63.00 - 133.00)	
MBLK	Heptachlor Epoxide	ND				
MBLK	Methoxychlor	ND				
MBLK	PCB 1016 Aroclor	ND				
MBLK	PCB 1221 Aroclor	ND				

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MBLK	PCB 1232 Aroclor	ND			
MBLK	PCB 1242 Aroclor	ND			
MBLK	PCB 1248 Aroclor	ND			
MBLK	PCB 1254 Aroclor	ND			
MBLK	PCB 1260 Aroclor	ND			
MBLK	Toxaphene	ND			
MBLK	p,p' DDD	ND			
MBLK	p,p' DDE	ND			
LCS1	p,p' DDT	0.100	0.123	123.000	(62.00 - 162.00)
LCS2	p,p' DDT	0.100	NA		(62.00 - 162.00)
MBLK	p,p' DDT	ND			
MS	p,p' DDT	0.100	0.122	122.000	(62.00 - 162.00)

QC Batch #46622 ICPMS Metals

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Antimony, Total, ICAP/MS	50	49.8	99.600	(85.00 - 115.00)	
MBLK	Antimony, Total, ICAP/MS	ND		0.000		
LCS1	Arsenic, Total, ICAP/MS	20	21.6	108.000	(85.00 - 115.00)	
MBLK	Arsenic, Total, ICAP/MS	ND		0.000		
LCS1	Barium, Total, ICAP/MS	100	99.6	99.600	(85.00 - 115.00)	
MBLK	Barium, Total, ICAP/MS	ND		0.000		
LCS1	Beryllium, Total, ICAP/MS	5	4.87	97.400	(85.00 - 115.00)	
MBLK	Beryllium, Total, ICAP/MS	ND		0.000		
LCS1	Cadmium, Total, ICAP/MS	20	19.4	97.000	(85.00 - 115.00)	
MBLK	Cadmium, Total, ICAP/MS	ND		0.000		
LCS1	Chromium, Total, ICAP/MS	100	102	102.000	(85.00 - 115.00)	
MBLK	Chromium, Total, ICAP/MS	ND		0.000		
LCS1	Copper, Total, ICAP/MS	100	98.8	99.000	(85.00 - 115.00)	
MBLK	Copper, Total, ICAP/MS	ND		0.000		
LCS1	Lead, Total, ICAP/MS	20	19.6	98.000	(85.00 - 115.00)	
MBLK	Lead, Total, ICAP/MS	ND		0.000		
LCS1	Nickel, Total, ICAP/MS	50	50.8	101.600	(85.00 - 115.00)	
MBLK	Nickel, Total, ICAP/MS	ND		0.000		
LCS1	Selenium, Total, ICAP/MS	20	20.3	101.500	(85.00 - 115.00)	
MBLK	Selenium, Total, ICAP/MS	ND		0.000		
LCS1	Thallium, Total, ICAP/MS	20	20.3	102.000	(85.00 - 115.00)	

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MBLK	Thallium, Total, ICAP/MS	ND	0.000	

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APPENDIX C:

COMMENTS AND RESPONSES

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

May 24, 1999

Ms. Mathilda Yoshioka
Housing Administrator
County of Kauai Housing Agency
4193 Hardy Street
Lihue, Hawaii 96766

Dear Ms. Yoshioka:

Subject: Draft Environmental Assessment for the Lihue and Hanamaulu Water Development Projects, Phase III

Thank you for the opportunity to review and comment on the subject document. We have the following comments and questions.

1. The proximity of the Pukaki Well site to the drainage ditch and Pukaki Reservoir, and the proximity of the Hanamaulu Well Nos. 3 and 4 sites to the irrigation ditch and Kapaia Reservoir indicate the possibility of surface water contamination and streamflow reduction. Please describe how the wells will be designed to minimize impact on the affected ditches and reservoirs. Also describe any plans to monitor the water quality and levels of the affected ditches and reservoirs.

2. Biological tests indicate that the wells do not meet DOH requirements. Please describe what steps will be taken to ensure the drinking water meets DOH standards.

3. In some instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. The EA should include a full discussion of any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users.

   These arrangements may include the formation of public utility companies and subsequent rate-setting, the establishment of county water commitments, the co-funding of state or county water system development, an executive order *or other set-aside of state lands, and purchase of land or* easements by public entities.

   Any or all of these arrangements and all permits or governmental approvals required to fulfill these commitments should be listed.

4. Please discuss how waters from the well will be used, and an analysis of how the proposed well development may affect land and water uses on the island and in the region. The analysis should include a discussion of the following (published materials may be referenced):

   * Hawaii State Water Plan and its component parts
   * County General, Development, and/or Community Plans
   * Plans for future water development within the aquifer
   * Any secondary or cumulative impacts caused by promoting land uses that alter the hydrology of the source and/or end-use area
   * An assessment of the well's impact on the land owners, water users including farmers and kuleana residents in the region.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185. Thank you.

Sincerely,

Genevieve Salmonson
Director

c: Fukunaga and Associates

1388 KAPIOLANI BOULEVARD / 2ND FLOOR / HONOLULU, HAWAII 96814 / PH. (808) 944-1821 / FAX (808) 946-9339

July 8, 1999

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

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment
Lihue and Hanamaulu Water Development Projects, Phase III and Hanamaulu Well No. 4 Water Development Project - Pukaki Well, Hanamaulu Well Nos. 3 & 4, Control Tank and Appurtenances

Thank you for your review and comments on the Draft EA. This letter is written on behalf of the Kauai County Housing Agency and the County of Kauai Department of Water in response to the comments in your letter dated May 24, 1999.

1. Comment: The proximity of the Pukaki Well site to the drainage ditch and Pukaki Reservoir, and the proximity of the Hanamaulu Well Nos. 3 and 4 sites to the irrigation ditch and Kapaia Reservoir indicate the possibility of surface water contamination and streamflow reduction. Please describe how the wells will be designed to minimize impact on the affected ditches and reservoirs. Also describe any plans to monitor the water quality and levels of the affected ditches and reservoirs.

Response: Pukaki Well and Hanamaulu Well Nos. 3 and 4 were designed and constructed to prevent surface water contamination and streamflow reduction from runoff, unlined reservoirs, and ditches. Design of each well includes solid well casing and sealing the annular space between the casing and borehole with cement grout from the ground surface to the following depths:

WELL	DEPTH OF GROUT SEAL
Pukaki Well	162 feet
Hanamaulu Well No. 3	130 feet
Hanamaulu Well No. 4	135 feet

The depths of solid casing and grouting in each well were based upon completely restoring the integrity of the impermeable geologic formations overlying the groundwater aquifer.

Like the existing Pukaki Well and Hanamaulu Well No. 3, Hanamaulu Well No. 4 will be monitored for water quality and hydrologic effects during planned pumping tests. When utilized as new potable water sources, the wells will be monitored for water quality and drawdown as required.

2. Comment: Biological tests indicate that the wells do not meet DOH requirements. Please describe what steps will be taken to ensure the drinking water meets DOH standards.

Response: During the drilling and testing phase, water quality that does not meet the biological requirements is common because of the disturbance caused by drilling and inadequate disinfection of drilling equipment. Therefore, upon installation of the well pumps, additional microbiological water quality testing will be performed. Test results that confirm the well waters meet the drinking water standards are anticipated. However, if the results prove that the well water does not meet the maximum microbiological contaminant level, the well water quality will be monitored and waters disinfected (chlorinated) in accordance with the Hawaii Administrative Rules, Title 11, Chapter 20.

3. Comment: In some instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. The EA should include a full discussion of any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users.

These arrangements may include the formation of public utility companies and subsequent rate-setting, the establishment of county water commitments, the co-funding of state or county water system development, an executive order or other set-aside of state lands, and purchase of land or easements by public entities.

Any or all of these arrangements and all permits or governmental approvals required to fulfill these commitments should be listed.

Response: As stated in the EA, the Department of Water plans to purchase the well and tank sites from Lihue Plantation Company, Ltd., the current land owner. Lihue Plantation Company, Ltd. has agreed to the sale conceptually; however, delineation of the parcels will not be finalized until construction is completed. Access and utility easements will also be obtained. At the present time, the land owner has not made any requests for water allocation from these water sources.

The Lihue Water Development Project is funded by a Special Purpose Grant from the United States Department of Housing and Urban Development. There are no restrictions on the water allocation for the project.

The Hanamaulu Water Development Project is funded by a Community Development Block Grant from the United States Department of Housing and Urban Development. The water produced by Hanamaulu Well No. 3 will be allocated to the Hanamaulu Community.

4. Comment: Please discuss how waters from the well will be used, and an analysis of how the proposed well development may affect land and water uses on the island and in the region. The analysis should include a discussion of the following (published materials may be referenced):

- Hawaii State Water Plan and its component parts
- County General, Development, and/or Community Plans
- Plans for future water development within the aquifer
- Any secondary or cumulative impacts caused by promoting land uses that alter the hydrology of the source and/or end-use area
- An assessment of the well's impact on the land owners, water users including farmers and kuleana residents in the region.

Response: As discussed in the EA, growth and expansion of the Lihue service area have generated potable water demands that have surpassed the capacities of the existing well sources. Additionally, existing pumpage has been reduced by more than 20 percent because of the large demands and dropping well water levels. Consequently, the Department of Water is currently restricting water requests for developments and subdivisions in the Hanamaulu area until additional source and storage facilities are developed. The additional source water provided by this project addresses deficiencies in the current system, and does not promote changes in land use. Cumulative or secondary impacts related to this project are not anticipated. Due to the agricultural land use of the area which relies primarily on surface water resources, it is not anticipated that the project will negatively impact land owners, farmers, kuleana residents, or other water users. The development of additional potable water sources to address source inadequacies of the Lihue Water System has been given the highest priority by the Department of Water.

The Department of Water will develop the subject water sources in accordance with the Hawaii State Water Plan which includes the water resource protection plan, Kauai Water Use and Development Plan, state water project plan, and

water quality plan. Permits and approvals required by the regulatory agencies will be obtained.

The Department of Water anticipates drilling at least one additional water well in the area; however the project is still in the planning stages and there is no budget for the development of the future well at this time.

We hope the responses address your comments to your satisfaction.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Lynn T. Katahara

cc: Kauai County Housing Agency
County of Kauai Department of Water

4463 Pahee Street
Lihue, Kauai, Hawaii 96766-2032
Tel. 808 246 4300
Fax: 808 246 8357

KAUAI ELECTRIC
Citizens Energy Services

June 4, 1999

In reply, refer to:
File #98-05-302FP

Ms. Lynn T. Katahara
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, HI 98814
Fax: (808) 946-9339

SUBJECT: Draft Environmental Assessment for Hanamaulu and Lihue Water Development Projects, Phase III

Dear Ms. Katahara:

In response to your letter dated May 10, 1999 requesting our review and comments on the Draft Environmental Assessment (DEA), Kauai Electric (KE) has reviewed this project and site location maps and have these concerns:

- According to The State of Hawaii, Public Utilities Commission General Order No. 6, Section III, 31.4; KE must be notified of any work being performed in the close vicinity of our facilities.
- Equipment or vehicle use under or near electrical power circuits must meet a 10 foot minimum clearance, noted in The State of Hawaii, OSHA Standards, Part 3, Section 12-141-3 d 6(c); or lines must be guarded from accidental contact. Scheduling needs to be made with Kauai Electric prior to construction if guarding is required.

As previously stated in our May 19, 1998 letter to ParEn, Inc., dba Park Engineering (attached), KE will serve the Pukeki and Hanamaulu Wells off an extension of the existing overhead electrical line on Maalo Road. In addition, the existing 7.2 KV single-phase line will need to be upgraded to three-phase 12.47 KV in order to service the wells.

Please have the consultants submit the plans to KE for our approval prior to construction. Topography maps may also be required to assist us in our review.

Kauai Electric looks forward to working with you on this project. If there are any questions regarding this project, please call Mr. Fred Pascual at (808) 822-9404 or myself at (808) 246-8273.

Sincerely,

Debra L. Santiago

Debra L. Santiago
Distribution Engineer

DLS:do

1388 KAPIOLANI BOULEVARD / 2ND FLOOR/HONOLULU, HAWAII 96814 / PH. (808) 944-1821 / FAX (808) 946-0339

July 8, 1999

Ms. Debra Santiago, Distribution Engineer
Kauai Electric
4463 Pahee Street
Lihue, Kauai, Hawaii 96766-2032

Dear Ms. Santiago:

Subject: Draft Environmental Assessment
Lihue and Hanamaulu Water Development Projects, Phase III and Hanamaulu Well No. 4 Water Development Project - Pukaki Well, Hanamaulu Well Nos. 3 & 4, Control Tank and Appurtenances

Thank you for your review and comments on the Draft EA. This letter is written on behalf of the Kauai County Housing Agency and the County of Kauai Department of Water in response to the comments in your letter dated June 4, 1999.

1. Comment: According to the State of Hawaii, Public Utilities Commission General Order No. 6, Section III, 31.4; KE must be notified of any work being performed in the close vicinity of our facilities.

   Response: Mr. Fred Pascual of KE staff has been informed of the projects and has been to the sites for a preliminary briefing of the projects. KE will be kept abreast of the design as it proceeds.

2. Comment: Equipment or vehicle use under or near electrical power circuits must meet a 10 foot minimum clearance, noted in the State of Hawaii, OSHA Standards, Part 3, Section 12-141-3 d 6(c); or lines must be guarded from accidental contact. Scheduling needs to be made with Kauai Electric prior to construction if guarding is required.

   Response: The Contractor will be informed of these requirements and will be responsible for scheduling with KE as required.

3. Comment: Please have the consultants submit the plans to KE for our approval prior to construction. Topography maps may also be required to assist us in our review.

   Response: Plans will be submitted to KE for approval and will be provided with information as required.

We hope the responses address your comments to your satisfaction.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Lynn T. Katahara

cc: Kauai County Housing Agency
County of Kauai Department of Water