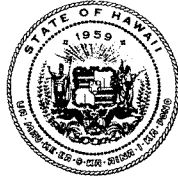


LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

**STATE OF HAWAII
DEPARTMENT OF HEALTH**

P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD/SDWB

December 2, 2004

11002GRC.04

To All Interested Parties:

SUBJECT: 2003 Groundwater Contamination Maps
for the State of Hawai'i

The Department of Health has been periodically updating the Groundwater Contamination Maps for the State of Hawai'i since August 1989. These maps identify locations where certain groundwater contaminants have been detected and confirmed.

Accompanying the 2003 Groundwater Contamination Maps is information about the basic health effects related to the contaminants. We emphasize that the detected levels reported in the maps are below existing Federal and State drinking water standards established for the protection of public health. Before contaminant levels reach these standards, appropriate public health protection measures are implemented.

The data presented in the maps and tables were collected between January and December 2003, except as indicated for earlier dates. Positive results are considered confirmed when verified by a follow-up test or by comparison with historical data.

If you have any questions or would like to obtain additional information related to groundwater contamination, please contact the Groundwater Protection Program, Safe Drinking Water Branch, at (808) 586-4258.

Sincerely,

A handwritten signature in black ink, appearing to read "Chiyome Leinaala Fukino".

Chiyome Leinaala Fukino, M.D.
Director of Health

Enclosures

**State of Hawai`i
Department of Health
Groundwater Contamination Maps
2003**

The 2003 Groundwater Contamination Maps for the State of Hawai`i are the eighth edition of the Maps since they were first published in August of 1989. The Maps were not published between 1999 and 2001 due to resource limitations. However, this publication includes historical monitoring data generated since the first publication unless subsequent monitoring data shows no detection at which time the contaminant was removed from the report.

Where do these Maps come from?

The 2003 Groundwater Contamination Maps for the State of Hawai`i were prepared by the Groundwater Protection Program, Safe Drinking Water Branch of the Hawai`i Department of Health (DOH). The Maps represent the most current information available to the DOH between January 1, 2003, through December 31, 2003, and are based on monitoring data for public drinking water wells and other testing data available to the DOH.

What do these Maps represent?

The 2003 Maps identify **organic chemical contaminants that have been detected and confirmed in drinking water wells and select non-potable wells** throughout the state. Groundwater can become contaminated through natural processes, but anthropogenic, or human-induced, contamination poses more serious problems. Contaminants may come from herbicides, pesticides, industrial solvents, and other sources which are applied, spilled, or leaked into the ground. Groundwater contamination is a significant concern because nearly all of Hawai`i's drinking water comes from groundwater sources.

The intent of the Maps is to identify only those wells with detectable levels of groundwater contamination. Some contaminated wells may not be reported because of lack of confirmed data, or the wells have not been tested. The contamination levels in this document refer to reported levels of contamination on a specific sampling date. Levels of groundwater contamination may fluctuate for a number of reasons, including actual diminishing or increasing levels of contamination, chemical breakdown of contaminants, variability in sampling and analytical methods, the effects of pumping rates, and other factors.

What do these Maps tell us?

The 2003 Maps show that groundwater contamination continues to occur in Hawai`i. In

most cases, once a groundwater source becomes contaminated, it remains contaminated for many years. The Maps show that a few wells that were previously not contaminated by a particular chemical have now shown positive detections of chemicals known to be present in nearby wells. The chemical benzene, a solvent and pesticide formerly used as a fumigant, was detected on O'ahu in 2003. The site is currently undergoing remediation (cleanup) by the U.S. Environmental Protection Agency (U.S. EPA).

No chemical contaminants have been detected in the drinking water wells on Moloka'i and Lana'i since the Maps were first prepared in 1989.

Is the water safe?

The 2003 Maps indicate that the contaminant concentrations detected in Hawai'i's groundwater are generally below state and federal drinking water standards*. This means that as long as concentrations are below these standards and advisory levels, the water is considered safe and does not pose a serious health risk. If contamination levels approach state and federal drinking water standards, the well's owner is required to take steps to reduce the contaminant concentration to a safe level. This could involve the installation of a treatment system, blending of the water with higher quality water, or removing the well from service.

How are the Maps organized?

This report contains maps and tables for the islands of O'ahu, Hawai'i, Maui and Kaua'i. The Maps identify the locations of current and historic contaminated wells and well fields (an area where many wells in proximity share the same groundwater source). The Maps also show **aquifer sectors** for each island in different colors. An aquifer sector is a large region with similar hydrogeological characteristics. The different aquifer sector colors are only for presentational purposes.

The tables include information about the contaminated well, such as the use of the well (e.g. drinking water, irrigation, industrial or inactive), the contaminant(s) detected, the concentration of the contaminant (e.g. detected level), the sampling date when the water sample was collected, and the drinking water standards and health risks associated with each contaminant.

A contaminant which has been identified in prior editions will be removed from the report if subsequent monitoring no longer shows detection. A well will be removed from the map if it does not show any detectable concentrations of contamination. But a well and associated contaminant(s) will remain on the map until new information confirms that concentrations have decreased to non-detectable levels. This is the case with several non-drinking water wells in this report that have not been monitored regularly.

* Refer to last page for explanations.

Where can I get more information about groundwater contamination and protection?

More information about the Maps and groundwater protection is available from the Department of Health's Groundwater Protection Program. Call the Groundwater Protection Program using the following telephone numbers:

O`ahu	586-4258
Hawai`i (toll free)	974-4000, ext. 64258
Kaua`i (toll free)	274-3141, ext. 64258
Maui (toll free)	984-2400, ext. 64258
Moloka`i and Lana`i (toll free)	1-800-468-4644, ext. 64258

The Groundwater Protection Program's address is:

Safe Drinking Water Branch
919 Ala Moana Blvd., Room 308
Honolulu, Hawai`i 96814

The website is:

<http://hawaii.gov/health/environmental/water/sdwb/conmaps/conmaps.html>

Definitions

The following are general definitions of the terms and abbreviations used in this report.

Before: water samples taken “before treatment”. Drinking water that contains a chemical contaminant above drinking water standards is treated to reduce the contaminant concentration to a safe level. All “after treatment” readings meet Federal and State drinking water standards.

Contaminant: organic chemical contaminants that have been detected and confirmed in wells used for drinking water, irrigation and industrial purposes.

The State Department of Health defines a contaminant as “...any physical, chemical, biological, or radiological substance or matter in water. An additive contaminant under this definition may have beneficial or detrimental effect on the potability of the water,” per Hawaii Administrative Rules, Title 11, Department of Health, Chapter 20, Rules Relating to Potable Water Systems.

DOA: Department of Agriculture.

DW: drinking water well.

Date: the date when the water sample was taken.

Detected level: the amount of a contaminant found in a sample. The numerical values are presented in “parts per billion” (ppb).

Detection Limit: the lowest concentration of a contaminant that can be detected by a laboratory through its testing equipment, analytical methods and personnel.

Historic: a well or well field where chemical contaminants have previously been detected.

IND: industrial well.

IRR: irrigation well.

Inactive: a well that is no longer in service.

Montgomery composite: water samples usually taken from two wells that are combined and tested for chemical contaminants by Montgomery Watson Laboratories in California.

ND: “non-detectable,” no presence of a contaminant at, or below the detection limit used by the laboratory. Indications below the detection limit are considered to be negative findings and are reported as: ND<0.05. “ND” identifies this as a “not detectable” result. The “<” is a “less than” sign, and “0.05” is the detection limit for the contaminant. Detection limits vary for different chemicals and analytical methods.

NQ: “non-quantifiable,” the lowest concentration of a contaminant to which a numerical value can be assigned. The level is also determined by the analytical method.

Indications below the quantification limit are reported as: NQ<0.10, where the “<” is a “less than” sign, and “0.10” is the quantification limit for the contaminant. As with detection limits, quantification limits differ for different chemicals and analytical methods. An “NQ” result means that the chemical concentration is between the quantification limit and the detection limit. Chemical concentrations above the quantification limit are given numerical values.

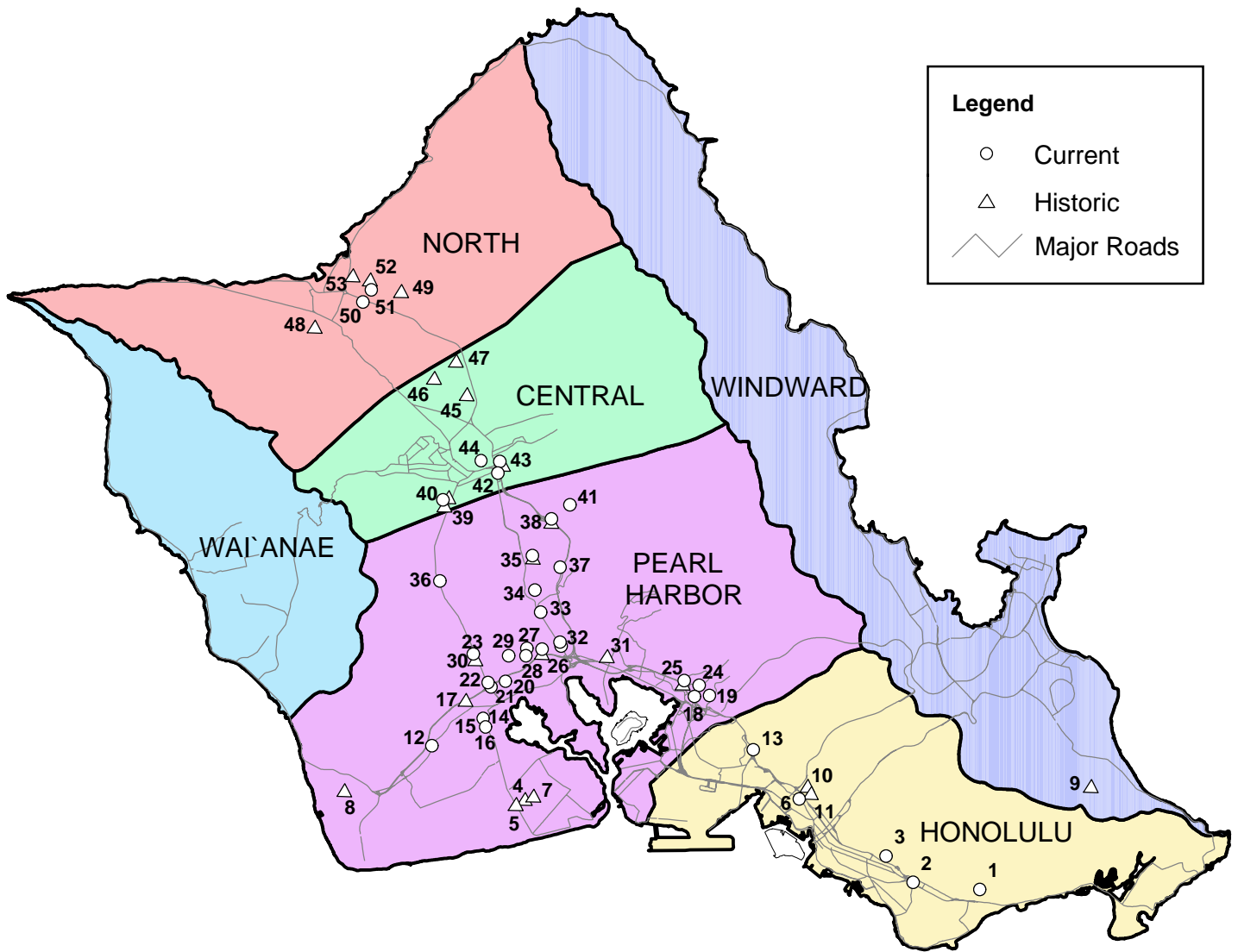
Old Hawaiian Datum: a geographic coordinate system used by the State Department of Land and Natural Resources (DLNR), Division of Water and Land Management of Hawai`i. The DLNR has assigned a six-digit number for each well, based on the latitude and longitude position of the well.

Parts per billion (ppb): a unit commonly used as an equivalent to “microgram per liter” (ug/L). One ug/L is approximately equivalent to a drop of contaminant in the volume of liquid contained in three Olympic-size swimming pools.

Quantification limit: the concentration level of a contaminant that can be confidently quantified by a laboratory’s testing equipment, analytical methods and personnel.

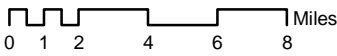
ISLAND OF O`AHU

2003 GROUNDWATER CONTAMINATION & AQUIFER SECTORS



Legend

- Current
- △ Historic
- Major Roads



Hawai'i State Department of Health
November 2004

O`AHU 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	1746-01	Ainakoia Well	DW	Dieldrin	0.027	7/28/03
2	1748-HS	Kaimuki Station Wells	DW	Dieldrin	0.017	10/29/03
2	1748-LS	Kaimuki Station Wells	DW	Dieldrin	0.016	10/29/03
2	1748-03 to 10	Kaimuki Station Wells	DW	PCE	0.030	4/23/85*
*ND after this date. PCE detection levels raised from 0.01 ppb to 0.2 ppb.						
3	1849-14	Wilder Well 1	DW	Dieldrin	0.013	11/5/03
4	1900-01	OSCO Ewa Pump 20	Inactive	Ametryn	NQ <0.05	11/10/92
4	1900-01	OSCO Ewa Pump 20	Inactive	Atrazine	0.71	11/16/93
4	1900-01	OSCO Ewa Pump 20	Inactive	Diamino Atrazine	0.22	11/10/93
4	1900-01	OSCO Ewa Pump 20	Inactive	Desethyl Atrazine	1.20	11/16/93
4	1900-01	OSCO Ewa Pump 20	Inactive	Deisopropyl Atrazine	0.13	11/16/93
5	1901-01	OSCO Ewa Pump 24	Inactive	Ametryn	0.11	11/10/92
5	1901-01	OSCO Ewa Pump 24	Inactive	Atrazine	1.10	11/10/92
5	1901-01	OSCO Ewa Pump 24	Inactive	Diamino Atrazine	0.50	11/10/92
5	1901-01	OSCO Ewa Pump 24	Inactive	Desethyl Atrazine	1.59	11/10/92
5	1901-01	OSCO Ewa Pump 24	Inactive	Deisopropyl Atrazine	0.21	11/10/92
6	1952-HS	Kalihi Station Wells	DW	Dieldrin	0.017	10/31/03
6	1952-LS	Kalihi Station Wells	DW	Dieldrin	0.01	10/31/03
7	2000-01	OSCO Ewa Pump 21	Inactive	Atrazine	0.77	11/16/93
7	2000-01	OSCO Ewa Pump 21	Inactive	Diamino Atrazine	0.25	11/16/93
7	2000-01	OSCO Ewa Pump 21	Inactive	Desethyl Atrazine	1.00	11/16/93
7	2000-01	OSCO Ewa Pump 21	Inactive	Deisopropyl Atrazine	0.13	11/16/93
8	2006-01 to 11	OSCO Ewa Pump 10	Inactive	Atrazine	NQ <0.1	11/17/92
8	2006-01 to 11	OSCO Ewa Pump 10	Inactive	Desethyl Atrazine	0.15	11/17/92
9	2043-02	Waimanalo Well 1	Inactive	Alachlor	0.530	1/27/98
10	2052-07	Kamehameha School Well 1	Inactive	Chlordane	NQ <0.3	4/1/98
10	2052-07	Kamehameha School Well 1	Inactive	Dieldrin	0.046	11/16/98
10	2052-11	Kamehameha School Well 2	Inactive	Chlordane	0.40	1/30/97
10	2052-11	Kamehameha School Well 2	Inactive	Dieldrin	0.018	10/23/96
11	2052-12	Jonathan Springs Well	Inactive	Chlordane	0.30	11/8/95
11	2052-12	Jonathan Springs Well	Inactive	Dieldrin	0.06	11/8/95
12	2103-03	Barbers Point Shaft	DW	Atrazine	0.074	10/30/03
12	2103-03	Barbers Point Shaft	DW	Desethyl Atrazine	0.119	11/10/03

O`AHU 2003 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
13	2153-10	Moanalua Wells P1	DW	Dieldrin	0.02	9/26/03
13	2153-11	Moanalua Wells P2	DW	Dieldrin	0.017	9/26/03
14	2202-03	OSCO Ewa Pump 3	IRR	Atrazine	NQ <0.051	11/10/03
14	2202-03	OSCO Ewa Pump 3	IRR	Desethyl Atrazine	0.115	11/10/03
15	2202-05	OSCO Pump 5	IRR	Atrazine	0.065	11/10/03
15	2202-05	OSCO Pump 5	IRR	Desethyl Atrazine	0.075	11/10/03
16	2202-15	OSCO Pump 7A	Inactive	Atrazine	NQ <0.05	11/12/03
16	2202-15	OSCO Pump 7A	Inactive	Desethyl Atrazine	0.011	11/12/03
17	2202-21	OSCO Ewa Pump 15	Inactive	Atrazine	0.15	11/17/92
17	2202-21	OSCO Ewa Pump 15	Inactive	Desethyl Atrazine	0.12	11/17/92
18	2255-32	Halawa Plant (Navy)	DW	Dieldrin	0.012	10/30/03
19	2255-37	BWS Halawa Well 2	DW	Chlordane	NQ<0.3	10/31/03
19	2255-37	BWS Halawa Well 2	DW	Dieldrin	0.047	10/31/03
19	2255-39	BWS Halawa Well 1	DW	Dieldrin	0.015	10/29/03
20	2301-34	Hoaeae, P1	DW	TCP	0.54	8/6/03
20	2301-35	Hoaeae, P2	DW	TCP	0.42	10/8/03
20	2301-36	Hoaeae, P4	DW	Atrazine	NQ 0.05	11/3/03
20	2301-36	Hoaeae, P4	DW	Desethyl	NQ 0.05	11/3/03
20	2301-36	Hoaeae, P4	DW	Dieldrin	0.015	3/18/03
20	2301-36	Hoaeae, P4	DW	TCP	0.47	10/8/03
20	2301-37	Hoaeae, P3	DW	TCP	0.39	10/8/03
20	2301-38	Hoaeae, P5	DW	TCP	0.39	10/8/03
20	2301-39	Hoaeae, P6	DW	TCP	0.34	10/8/03
21	2301-40	Kunia III P1	DW	TCP	0.18	11/4/03
21	2301-41	Kunia III P2	DW	TCP	0.2	10/16/03
21	2301-42	Kunia III P3	DW	TCP	0.18	10/16/03
22	2302-01	Kunia Wells I, P1 (before)	DW	TCE	NQ<0.5	10/6/03
22	2302-01	Kunia Wells I, P1 (before)	DW	TCP	0.69	10/6/03
22	2302-02	Kunia Wells I, P2 (before)	DW	Atrazine	0.057	11/10/03
22	2302-02	Kunia Wells I, P2 (before)	DW	Desethyl Atrazine	0.093	11/10/03
22	2302-02	Kunia Wells I, P2 (before)	DW	TCE	NQ<0.5	1/10/03
22	2302-02	Kunia Wells I, P2 (before)	DW	TCP	0.64	10/6/03
22	2302-03	Kunia Wells I, P3 (before)	DW	TCP	0.61	10/6/03
22	2302-04	Kunia Wells I, P4 (before)	DW	TCE	NQ<0.5	10/6/03
22	2302-04	Kunia Wells I, P4 (before)	DW	TCP	0.64	10/6/03

O`AHU 2003 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
23	2302-01 to 04	Kunia Wells I	DW	Desethyl Atrazine	<0.1	9/28/93
23	2302-01 to 04	Kunia Wells I	DW	TCP	0.70	5/21/97
24	2355-06	Aiea Well Pump 1	DW	Dieldrin	0.014	10/31/03
24	2355-07	Aiea Well Pump 2	DW	Dieldrin	0.013	10/29/03
25	2356-58	Kaamilo Wells	DW	Dieldrin	0.01	8/7/03
25	2356-59	Kaamilo Wells	DW	Dieldrin	0.014	4/1/98
25	2356-58 & 59	Kaamilo Wells	DW	PCE	0.03	4/20/85
26	2400-01	Waipahu I, P2 (before)	DW	EDB	NQ<0.04	11/10/03
26	2400-01	Waipahu I, P2 (before)	DW	TCE	NQ<0.5	11/21/03
26	2400-01	Waipahu I, P2 (before)	DW	TCP	0.32	11/10/03
26	2400-02	Waipahu I, P1 (before)	DW	EDB	NQ<0.04	11/10/03
26	2400-02	Waipahu I, P1 (before)	DW	TCE	NQ<0.5	11/21/03
26	2400-02	Waipahu I, P1 (before)	DW	TCP	0.37	11/10/03
26	2400-03	Waipahu I, P4 (before)	DW	EDB	NQ<0.04	4/14/99
26	2400-03	Waipahu I, P4 (before)	DW	TCP	NQ<0.5	4/14/99
26	2400-04	Waipahu I, P3 (before)	DW	EDB	NQ<0.04	11/10/03
26	2400-04	Waipahu I, P3 (before)	DW	TCE	NQ<0.5	11/21/03
26	2400-04	Waipahu I, P3 (before)	DW	TCP	0.042	11/10/03
27	2400-05	Waipahu II P1 (before)	DW	TCP	0.56	10/8/03
27	2400-06	Waipahu II P2 (before)	DW	TCP	0.49	10/8/03
28	2400-08	Waipahu II P3 (before)	DW	TCP	0.51	11/5/03
29	2401-04	Kunia III, P1 (before)	DW	TCP	0.18	11/4/03
29	2401-05	Kunia III, P2 (before)	DW	TCP	0.20	10/16/03
29	2401-06	Kunia III, P3 (before)	DW	TCP	0.18	10/16/03
30	2402-01	Kunia Wells II, P1(before)	DW	DBCP	NQ<0.04	7/20/01
30	2402-01	Kunia Wells II, P1(before)	DW	TCE	NQ<0.05	7/20/01
30	2402-01	Kunia Wells II, P1(before)	DW	TCP	1.20	11/9/98
30	2402-02	Kunia Wells II, P2 (before)	DW	DBCP	NQ<0.04	5/16/03
30	2402-02	Kunia Wells II, P2 (before)	DW	TCE	NQ<0.5	10/6/03
30	2402-02	Kunia Wells II, P2 (before)	DW	TCP	0.91	10/6/03
30	2402-03	Kunia Wells II, P3 (before)	DW	DBCP	NQ<0.04	7/18/02
30	2402-03	Kunia Wells II, P3 (before)	DW	TCE	NQ<0.5	5/16/03
30	2402-03	Kunia Wells II, P3 (before)	DW	TCP	1.22	5/16/03
31	2458-01	Manana Shaft	DW	PCE	0.03	4/18/85*
				*ND after this date. PCE detection levels raised from 0.01 ppb to 0.2 ppb.		

O'AHU 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
32	2459-19	Waipio Hts P2	DW	TCP	0.2	10/21/03
32	2459-20	Waipio Hts P1	DW	TCP	0.39	10/8/03
32	2459-23	Waipio Hts I, P1	DW	TCP	0.12	10/8/03
32	2459-24	Waipio Hts I, P2	DW	TCP	0.19	1/16/03
33	2500-01	Waipio Hts. II, P1	DW	TCE	0.6	12/3/03
33	2500-01	Waipio Hts. II, P1	DW	TCP	0.51	10/21/03
33	2500-02	Waipio Hts. II, P2	DW	TCE	0.6	12/3/03
33	2500-02	Waipio Hts. II, P2	DW	TCP	NQ<0.5	10/30/96
34	2600-02	Dairy Co.	DW	TCE	NQ<0.5	11/20/03
34	2600-02	Dairy Co.	DW	TCP	0.69	10/21/03
35	2600-03	Mililani III, P7 (before)	DW	DBCP	0.06	11/21/03
35	2600-03	Mililani III, P7 (before)	DW	DCP	NQ<1	8/18/03
35	2600-03	Mililani III, P7 (before)	DW	TCP	1.21	11/21/03
35	2600-04	Mililani III, P8 (before)	DW	DBCP	0.09	7/18/02
35	2600-04	Mililani III, P8 (before)	DW	DCP	NQ<1	12/13/02
35	2600-04	Mililani III, P8 (before)	DW	TCP	2.29	7/18/02
36	2603-01	Hawaii Country Club (before)	DW	DBCP	0.06	10/7/03
36	2603-01	Hawaii Country Club (before)	DW	EDB	NQ<0.04	1/27/03
36	2603-01	Hawaii Country Club (before)	DW	TCP	0.25	10/7/03
37	2659-02	Waipio Hts III, P2	DW	EDB	ND<0.01	2/28/00
37	2659-02	Waipio Hts III, P2	DW	TCP	NQ<0.5	2/28/00
37	2659-03	Waipio Hts III, P1	DW	DBCP	NQ<0.04	10/21/03
37	2659-03	Waipio Hts III, P1	DW	TCP	0.45	10/21/03
38	2800-01	Mililani I, P1 (before)	DW	DBCP	0.16	11/20/03
38	2800-01	Mililani I, P1 (before)	DW	DCP	NQ<1	11/20/03
38	2800-01	Mililani I, P1 (before)	DW	TCP	2.05	11/17/03
38	2800-02	Mililani I, P2 (before)	DW	DBCP	0.13	11/17/03
38	2800-02	Mililani I, P2 (before)	DW	DCP	NQ<1	11/17/03
38	2800-02	Mililani I, P2 (before)	DW	TCP	2.04	11/17/03
38	2800-03	Mililani I, P3 (before)	DW	DBCP	0.14	11/17/03
38	2800-03	Mililani I, P3 (before)	DW	DCP	NQ<1	11/17/03
38	2800-03	Mililani I, P3 (before)	DW	TCP	3.61	11/17/03
38	2800-04	Mililani I, P4 (before)	DW	DBCP	0.18	5/12/00
38	2800-04	Mililani I, P4 (before)	DW	DCP	NQ<1.0	6/15/00
38	2800-04	Mililani I, P4 (before)	DW	TCP	2.5	5/12/00
39	2803-03 & 04	Kunia Battery	IND	Atrazine	NQ<0.05	9/28/93
39	2803-03 & 04	Kunia Battery	IND	Desethyl Atrazine	NQ<0.05	9/30/92
39	2803-03 & 04	Kunia Battery	IND	PCE	1.65	4/23/85
39	2803-03 & 04	Kunia Battery	IND	TCE	3.70	7/24/85

O`AHU 2003 Contamination Map

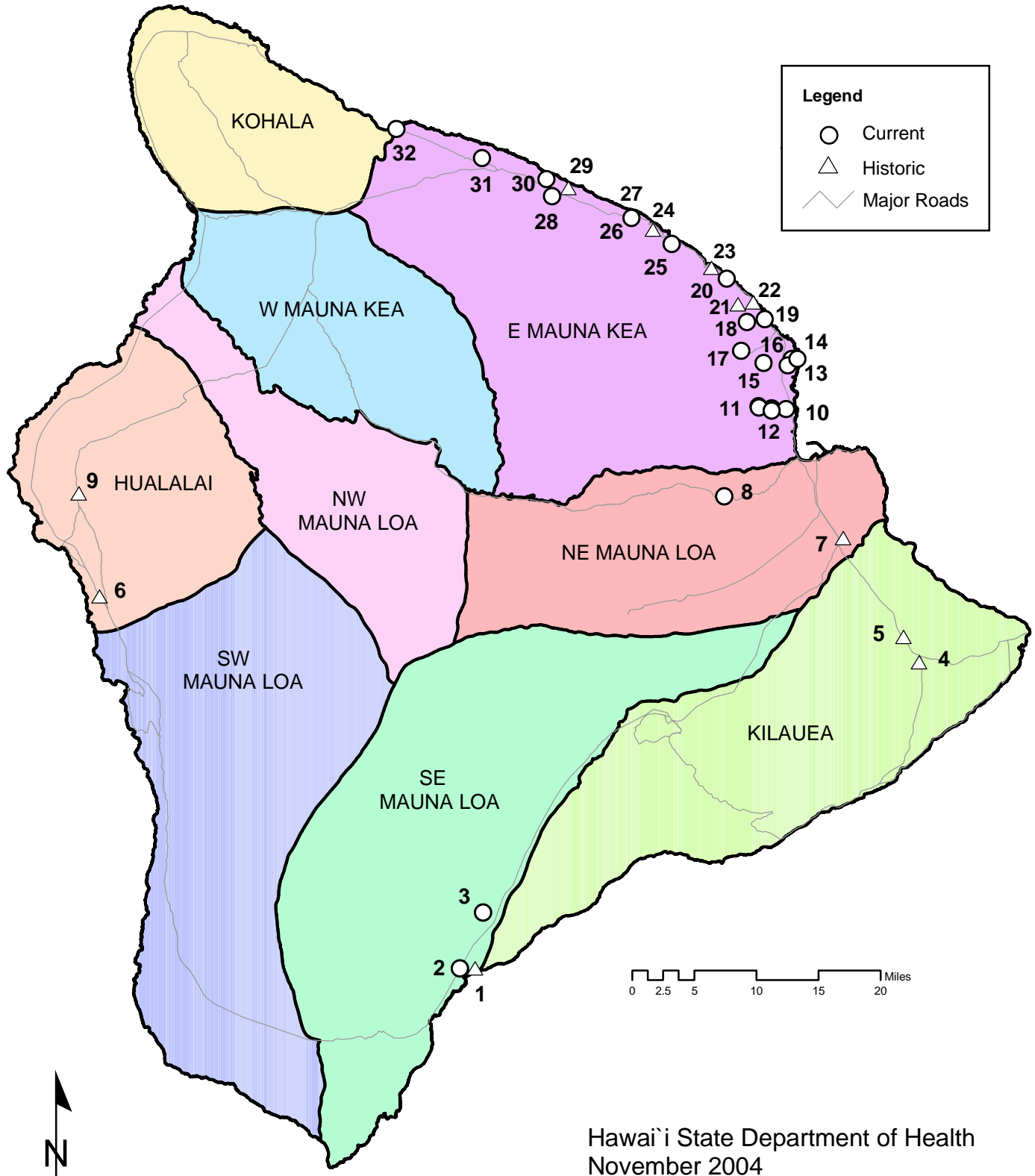
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
40	2803-05	Del Monte Kunia 3 (before)	DW	Bezene	NQ<0.5	10/7/03
40	2803-05	Del Monte Kunia 3 (before)	DW	CTC	0.6	12/4/03
40	2803-05	Del Monte Kunia 3 (before)	DW	DCP	NQ<1	12/4/03
40	2803-05	Del Monte Kunia 3 (before)	DW	TCE	4.1	12/4/03
40	2803-05	Del Monte Kunia 3 (before)	DW	TCP	0.13	10/7/03
40	2803-07	Del Monte Kunia 4 (before)	DW	TCE	0.9	10/7/03
40	2803-07	Del Monte Kunia 4 (before)	DW	TCP	0.12	10/7/03
41	2859-01	Mililani II, P5 (before)	DW	DBCP	0.12	2/3/03
41	2859-01	Mililani II, P5 (before)	DW	TCP	2.14	8/19/03
41	2859-02	Mililani II, P6 (before)	DW	DBCP	0.16	11/17/03
41	2859-02	Mililani II, P6 (before)	DW	TCP	2.27	11/17/03
42	2901	Schofield Battery (before)	DW	PCE	NQ<0.5	11/20/03
42	2901	Schofield Battery (before)	DW	TCE	16.8	11/20/03
43	2901-08	Wahiawa Wells 1, P3	DW	CTC	NQ<0.5	11/18/03
43	2901-08	Wahiawa Wells 1, P3	DW	PCE	1.4	11/18/03
43	2901-11	Wahiawa Wells 1, P1	DW	CTC	NQ<0.5	11/18/03
43	2901-11	Wahiawa Wells 1, P1	DW	PCE	NQ<0.5	11/18/03
43	2901-11	Wahiawa Wells 1, P1	DW	TCE	NQ<0.5	11/18/03
43	2901-12	Wahiawa Wells 1, P2	DW	CTC	0.6	4/17/97
43	2901-12	Wahiawa Wells 1, P2	DW	PCE	0.6	4/17/97
44	2902-01	Wahiawa Wells II, P1	DW	CTC	NQ<0.5	11/20/03
44	2902-01	Wahiawa Wells II, P1	DW	PCE	0.6	11/20/03
44	2902-01	Wahiawa Wells II, P1	DW	TCP	0.1	11/20/03
45	3102-02	Waiialua Sugar P24	IRR	DBCP	0.02	8/20/84
45	3102-02	Waiialua Sugar P24	IRR	TCP	0.50	6/3/85
46	3203-01	Waiialua Sugar P25	IRR	DBCP	0.12	6/7/83
47	3203-02	Waiialua Sugar P26	IRR	DBCP	0.01	6/3/85
47	3203-02	Waiialua Sugar P26	IRR	TCP	0.80	6/3/85
48	3307-01	Waiialua Battery P2	DW	Atrazine	0.12	11/4/92
48	3307-01	Waiialua Battery P2	DW	Desethyl Atrazine	0.15	11/14/92
49	3404-02	Waiialua Sugar P17	IRR	DBCP	0.06	11/9/93
49	3404-02	Waiialua Sugar P17	IRR	TCP	1.10	11/9/93
50	3405-01	Waiialua Wells P1	DW	TCE	0.5	11/18/03
50	3405-01	Waiialua Wells P1	DW	TCP	0.56	11/18/03
50	3405-02	Waiialua Wells P2	DW	DBCP	NQ<0.04	11/17/03
50	3405-02	Waiialua Wells P2	DW	TCE	0.5	11/18/03
50	3405-02	Waiialua Wells P2	DW	TCP	0.5	11/18/03

O`AHU 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
51	3405-03	Haleiwa Well P1	DW	DBCP	NQ<0.04	5/20/03
51	3405-03	Haleiwa Well P1	DW	TCE	NQ<0.5	11/18/03
51	3405-03	Haleiwa Well P1	DW	TCP	0.51	11/18/03
51	3405-04	Haleiwa Well P2	DW	DBCP	NQ<0.04	8/8/03
51	3405-04	Haleiwa Well P2	DW	TCE	NQ<0.5	11/18/03
51	3405-04	Haleiwa Well P2	DW	TCP	0.53	11/18/03
52	3505-01 to 20	Waialua Sugar P3	Inactive	DBCP	NQ < 0.04	7/24/97
52	3505-01 to 20	Waialua Sugar P3	Inactive	TCP	NQ <0.5	7/24/97
53	3506-03	Haleiwa Battery	IRR	Atrazine	0.13	11/4/92
53	3506-03	Haleiwa Battery	IRR	Lindane	0.002	11/12/87

ISLAND OF HAWAII

GROUNDWATER CONTAMINATION & AQUIFER SECTORS



HAWAII 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	0830-02	Punaluu Th-2	IRR	Atrazine	0.12	12/21/93
1	0830-02	Punaluu Th-2	IRR	Desethyl Atrazine	0.16	12/21/93
2	0831-02	Ninole A	DW	Atrazine	0.053	1/12/04
2	0831-02	Ninole A	DW	Desethyl Atrazine	0.125	1/12/04
2	0831-03	Ninole B	DW	Atrazine	NQ<0.05	1/12/04
2	0831-03	Ninole B	DW	Desethyl Atrazine	0.112	1/12/04
2	0831-00	Ninole Field	DW	Atrazine	0.09	12/8/03
3	1229-01	Pahala Well	DW	Atrazine	0.098	1/12/03
3	1229-01	Pahala Well	DW	Desethyl Atrazine	0.137	1/12/04
4	2986-01	Pahoa Well 1	DW	Diuron	0.8	8/5/91
4	2986-02	Pahoa Well 2	DW	Diuron	0.8	8/5/91
5	3188-02	Keonepoko Nui 2	DW	Isophorone	0.5	4/24/01
6	3557-02	Kahaluu Well B	Inactive	Isophorone	0.8	8/4/98
7	3802-03 & 04	Keaau	IND	Ametryne	0.88	2/27/84
7	3802-03 & 04	Keaau	IND	Atrazine	0.26	2/27/84
8	4110-01	Saddle Road Well A	DW	Isophorone	0.58	11/4/03
9	4258-03	Hualalai Well	DW	Isophorone	0.6	8/7/00
10	4706-01	Papaikou Deep Well	DW	Atrazine	0.2	9/5/03"
10	4706-01	Papaikou Deep Well	DW	Simazine	0.05	9/5/03"
11	4708	Papaikou Spring	DW	Atrazine	0.2	9/5/03"
11	4708	Papaikou Spring	DW	Simazine	0.05	9/5/03"
12	4708-00	Kaieie Spring	DW	Atrazine	0.300	12/9/03
12	4708-00	Kaieie Spring	DW	Desethyl Atrazine	0.515	12/9/03
12	4708-00	Kaieie Spring	DW	Simazine	0.05	9/5/03"
13	5005-01	Pepeekeo Sugar Makai	Inactive	Atrazine	NQ <0.500	1/22/96
13	5005-01	Pepeekeo Sugar Makai	Inactive	Desethyl Atrazine	0.8	12/14/93
13	5005-01	Pepeekeo Sugar Makai	Inactive	Diuron	0.5	8/5/91
13	5005-01	Pepeekeo Sugar Makai	Inactive	Hexazinone	0.3	8/5/91
13	5005-02	Pepeekeo Sugar	Inactive	Atrazine	0.263	12/8/03
13	5005-02	Pepeekeo Sugar	Inactive	Desethyl Atrazine	0.261	12/8/03
13	5005-02	Pepeekeo Sugar	Inactive	Diuron	0.8	8/5/91
						"Composite

HAWAII 2003 Contamination Map

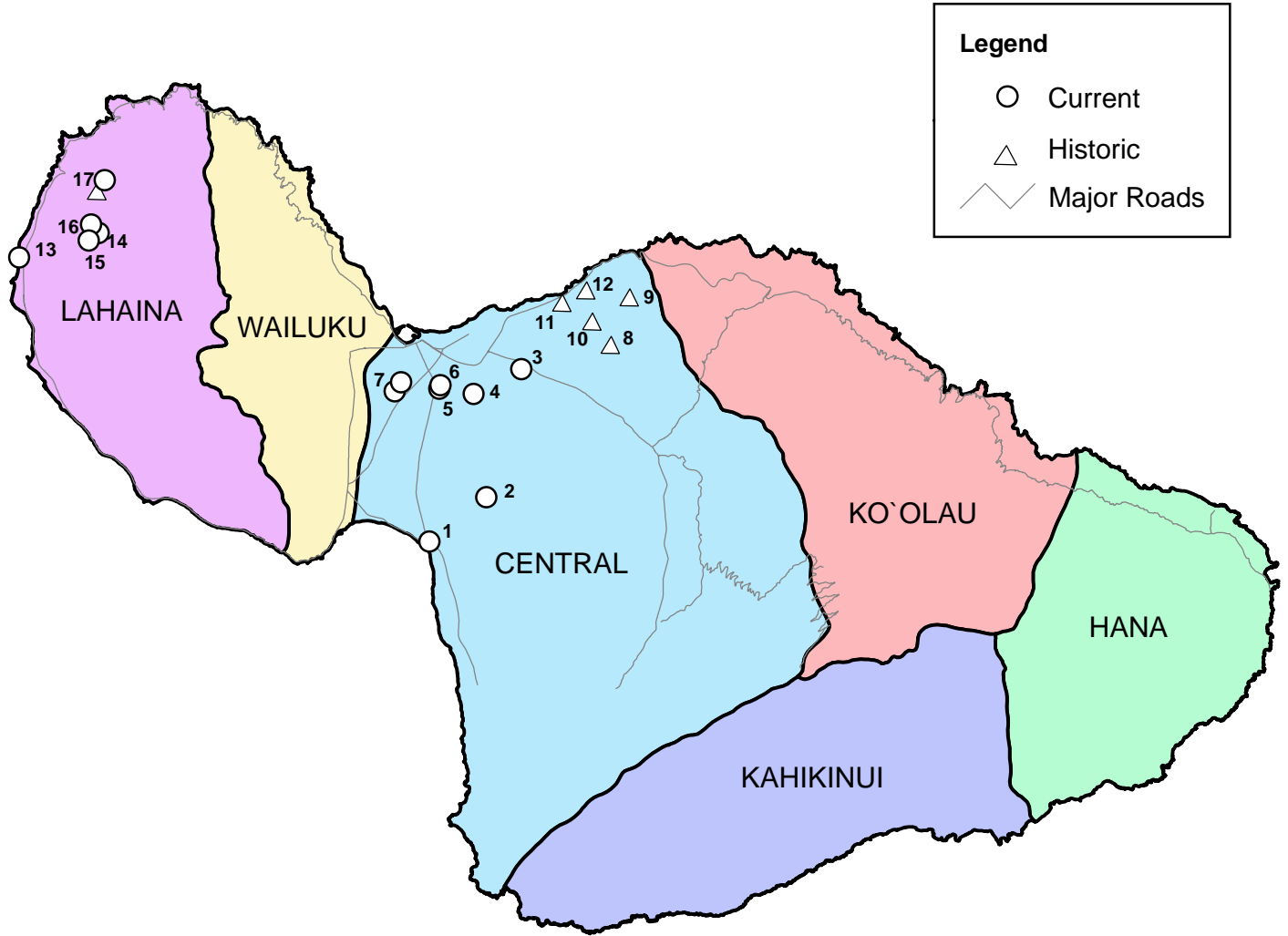
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14	5005-03	HCPC Makai Well 2	Inactive	Atrazine	0.299	12/8/03
14	5005-03	HCPC Makai Well 2	Inactive	Desethyl Atrazine	0.289	12/8/03
14	5005-04	HCPC Makai Well	Inactive	Atrazine	0.300	12/8/03
14	5005-04	HCPC Makai Well	Inactive	Desethyl Atrazine	0.293	12/8/03
15	5006-00	Maukaloa Spring	DW	Atrazine	0.099	12/9/03
15	5006-00	Maukaloa Spring	DW	Desethyl Atrazine	0.091	12/9/03
15	5006-00	Maukaloa Spring	DW	Deisopropyl Atrazine	0.076	12/9/03
15	5006-00	Maukaloa Spring	DW	Simazine	0.053	12/9/03
16	5006-01	Kulaimano Deep Well	DW	Atrazine	0.272	12/8/03
16	5006-01	Kulaimano Deep Well	DW	Desethyl Atrazine	0.131	112/8/03
16	5006-01	Kulaimano Deep Well	DW	Diuron	0.6	8/5/91
16	5006-01	Kulaimano Deep Well	DW	Simazine	0.05	9/5/03"
17	5109	Akaka Falls Spring	DW	Atrazine	0.1	9/5/03"
18	5210	Hakalau Iki Spring	DW	Atrazine	0.1	9/5/03"
19	5307-01	Hakalau Well	DW	Atrazine	0.180	12/15/03
19	5307-01	Hakalau Well	DW	Desethyl Atrazine	0.457	12/15/03
19	5307-01	Hakalau Well	DW	PCE	0.13	5/6/1985*
				*Detection level changed from 0.01 ppb to 0.2 ppb.		
20	5610-00	Chaves Spring	DW	Atrazine	0.193	12/9/03
20	5610-00	Chaves Spring	DW	Desethyl Atrazine	0.141	12/9/03
21	5611-00	Kaiaakea Spring	Inactive	Atrazine	0.143	12/9/03
21	5611-00	Kaiaakea Spring	Inactive	Desethyl Atrazine	0.102	12/9/03
22	5613-00	Kihalani Spring	Inactive	Hexazinone	0.57	9/9/86
23	5713-00	Papaaloa Spring	Inactive	Atrazine	0.56	2/28/95
24	5814-00	Manowaiopae Spring	Inactive	Atrazine	0.13	6/6/2002**
				** Composite with Laupahoehoe		
25	5814-01	Laupahoehoe Well 1	DW	Atrazine	0.079	12/16/03
25	5814-01	Laupahoehoe Well 1	DW	Desethyl Atrazine	0.134	12/16/03
25	5814-02	Laupahoehoe Well 2	DW	Atrazine	0.092	12/16/03
25	5814-02	Laupahoehoe Well 2	DW	Desethyl Atrazine	0.167	12/16/03
25	5814-01 & 02	Laupahoehoe Well 1 & 2	DW	Desethyl Atrazine	0.82	1/12/93
25	5814-01 & 02	Laupahoehoe Well 1 & 2	DW	Deisopropyl Atrazine	0.23	1/12/93
25	5814-01 & 02	Laupahoehoe Well 1 & 2	DW	Diamino Atrazine	0.17	1/12/93
25	5814-01 & 02	Laupahoehoe Well 1 & 2	DW	Hexazinone	1.3	9/25/90
25	5814-LM	Laupahoehoe Well	DW	Atrazine	0.096	11/20/03
						"Composite

HAWAI'I 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
26	6017-05	Ookala Well	DW	Atrazine	0.623	12/16/03
26	6017-05	Ookala Well	DW	Desethyl Atrazine	0.932	12/16/03
26	6017-05	Ookala Well	DW	Hexazinone	0.236	12/16/03
26	6017-05	Ookala Well	DW	Isophorone	0.7	7/26/00***
					***Composite with Paauilo	
27	6117-01	Ookala Shaft	Inactive	Atrazine	0.6	9/11/96
27	6117-01	Ookala Shaft	Inactive	Desethyl Atrazine	1	1/12/93
27	6117-01	Ookala Shaft	Inactive	Deisopropyl Atrazine	0.16	1/12/93
27	6117-01	Ookala Shaft	Inactive	Diamino Atrazine	0.15	1/12/93
28	6223-01	Paauilo Well	DW	Atrazine	0.728	12/16/03
28	6223-01	Paauilo Well	DW	Desethyl Atrazine	1.136	12/16/03
28	6223-01	Paauilo Well	DW	Deisopropyl Atrazine	0.053	12/16/03
28	6223-01	Paauilo Well	DW	Diamino Atrazine	0.053	12/16/03
28	6223-01	Paauilo Well	DW	Hexazinone	0.243	12/16/03
28	6223-01	Paauilo Well	DW	Isophorone	0.7	7/26/02***
					***Composite with Ookala	
29	6321-02	Paauilo Shaft	Inactive	Atrazine	0.59	2/28/95
29	6321-02	Paauilo Shaft	Inactive	Hexazinone	1.1	9/9/86
30	6323-01	Big Island Meat	Inactive	Atrazine	0.266	12/15/03
30	6323-01	Big Island Meat	Inactive	Desethyl Atrazine	0.393	12/15/03
30	6323-01	Big Island Meat	Inactive	Hexazinone	0.309	12/15/03
31	6528-01	Haina Well	DW	Atrazine	0.331	12/8/03
31	6528-01	Haina Well	DW	Desethyl Atrazine	0.602	12/8/03
31	6528-01	Haina Well	DW	Hexazinone	0.149	12/8/03
32	6734-01	Waiuliuli Spring	DW	Atrazine	0.126	12/15/03
32	6734-01	Waiuliuli Spring	DW	Desethyl Atrazine	0.167	12/15/03

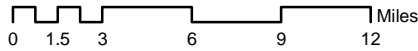
ISLAND OF MAUI

2003 GROUNDWATER CONTAMINATION & AQUIFER SECTORS



Legend

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- Major Roads



Hawai'i State Department of Health
November 2004

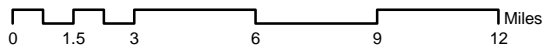
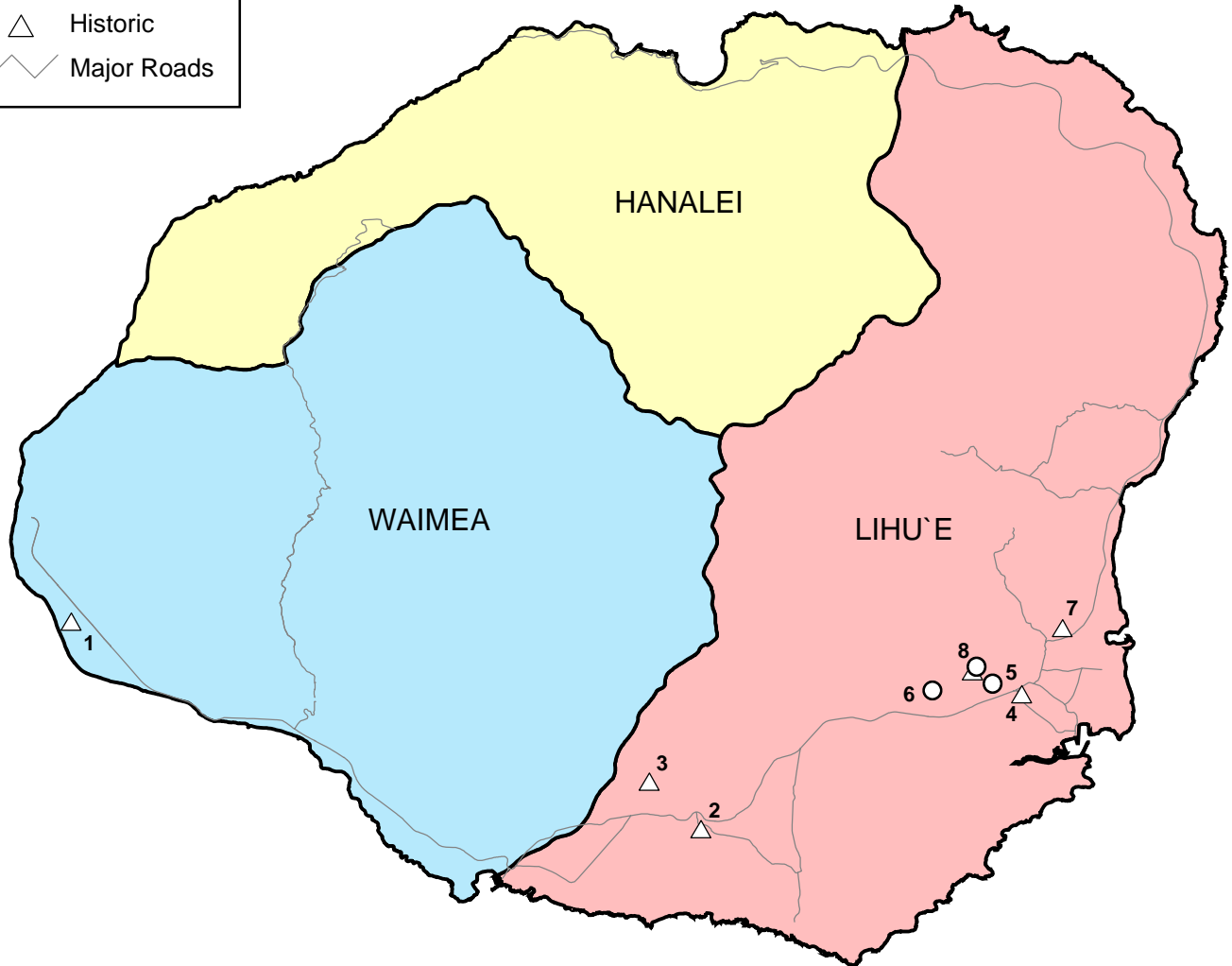
MAUI 2003 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	4727-01	Kihei Well 1	IRR	Atrazine	0.120	11/24/03
1	4727-01	Kihei Well 1	IRR	Desethyl Atrazine	0.244	11/24/03
1	4727-01	Kihei Well 1	IRR	Diamino Atrazine	0.069	11/24/03
2	4825-01	Kihei Well 3	IRR	Atrazine	0.054	11/24/03
2	4825-01	Kihei Well 3	IRR	Desethyl Atrazine	0.138	11/24/03
3	5224-02	Puunene Pump 9	IRR	Desethyl Atrazine	0.055	11/24/03
4	5226-02	Puunene Pump 6	IRR	Atrazine	0.080	11/24/03
4	5226-02	Puunene Pump 6	IRR	Desethyl Atrazine	0.096	11/24/03
5	5227-04	Puunene Pump 7A	IND	Desethyl Atrazine	0.094	11/25/03
5	5227-04	Puunene Pump 7A	IND	EDB	0.040	3/12/85
6	5227-05	Puunene Mill Pump 19	IRR	Atrazine	0.079	11/24/03
6	5227-05	Puunene Mill Pump 19	IRR	Desethyl Atrazine	0.128	11/24/03
7	5228-06	Reynolds Food Well #1	Inactive	DBCP	N.Q. <0.04	2/16/93
8	5321-01	Kaheka #18	IRR	DBCP	0.018	8/16/89
8	5321-01	Kaheka #18	IRR	EDB	0.050	8/16/89
8	5321-01	Kaheka #18	IRR	TCP	0.130	8/16/89
9	5420-01	Maui High School	IRR	DBCP	0.091	3/4/85
9	5420-01	Maui High School	IRR	EDB	0.067	3/4/85
9	5420-01	Maui High School	IRR	TCP	0.430	3/4/85
10	5422-02	Paia #7	IRR	Atrazine	0.23*	3/11/97
10	5422-02	Paia #7	IRR	EDB	0.028	3/4/85
11	5423-02	Paia #16	IRR	Atrazine	0.10*	3/17/98
11	5423-02	Paia #16	IRR	Atrazine	NQ<0.05	11/25/03
11	5423-02	Paia #16	IRR	Bromacil	0.415	11/25/03
11	5423-02	Paia #16	IRR	Desethyl Atrazine	0.090	11/25/03
12	5522-01	Kuau Pump 12	IRR	TCP	0.430	3/4/85
13	5641-01	Kaanapali Pump D	IRR	Ametryn	0.209	12/2/03
14	5738-01	Kaanapali P5 (before)	DW	DBCP	0.06	5/22/03
14	5738-01	Kaanapali P5 (before)	DW	TCP	0.66	5/22/03
					*DOA	

ISLAND OF KAUA'I

2003 GROUNDWATER CONTAMINATION & AQUIFER SECTORS

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KAUA'I 2003 Contamination Map

Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	0045-04	Barking Sands	IRR	Ametryn	0.80	7/12/88
1	0045-04	Barking Sands	IRR	Atrazine	3.50	7/12/88
1	0045-04	Barking Sands	IRR	Simazine	0.20	7/12/88
2	5530-02	Lawai Cannery Deep Well	Inactive	Aroclor	>0.33	8/5/99
3	5631-01	Kalaheo Deep Well 1	DW	Isophorone	0.7	9/20/01*
4	5822-02	Grammar School Well	DW	Isophorone	0.6	7/8/98
5	5823-01	Garlinghouse Tunnel	DW	Atrazine	0.053	11/17/03
5	5823-01	Garlinghouse Tunnel	DW	Desethyl Atrazine	N.Q. < 0.05	11/17/03
6	5824-06	Puhi Well 4	DW	DBCP	NQ<0.04	11/24/03
6	5824-06	Puhi Well 4	DW	EDB	NQ<0.04	11/24/03
6	5824-06	Puhi Well 4	DW	TCE	NQ<0.5	10/31/02
6	5824-06	Puhi Well 4	DW	TCP	0.08	11/24/03
7	5921-01	Kalepa	DW	Isophorone	0.50	9/19/02*
8	5923-02	Kilohana B	DW	Isophorone	1.60	9/5/01*
8	5923-03	Kilohana C	DW	Atrazine	0.081	11/24/03
8	5923-03	Kilohana C	DW	Bromacil	0.201	11/17/03
					*Montgomery composite	

MAUI 2003 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
15	5739-01	Kaanapali P4 (before)	DW	DBCP	NQ<0.04	11/20/03
15	5739-01	Kaanapali P4 (before)	DW	TCP	0.48	11/20/03
					*DOA	
16	5739-02	Kaanapali P6 (before)	DW	DBCP	0.13	11/20/03
16	5739-02	Kaanapali P6 (before)	DW	TCP	0.46	11/20/03
16		Kaanapali Blend	DW	TCP	0.04	11/20/03
17	5838-01	Napili A	Inactive	DBCP	0.360	6/4/93
17	5838-03	Honokohau (Napili D)	DW	DBCP	NQ<0.04	11/24/03
17	5838-03	Honokohau (Napili D)	DW	TCP	0.09	11/24/03

**Federal and State Drinking Water Standards
and
Health Advisories**

Contaminant	Contamina- tion level in ppb (parts per billion)	Applicable Drinking Water Standard	Potential Health Effects from Ingestion of Water	Potential Contamination Sources
Alachlor	2	MCL	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer.	Herbicide
Ametryn	60	LHA	Liver damage.	Herbicide
Atrazine	3	MCL	Cardiovascular system or reproductive problems.	Herbicide
*Desethyl Atrazine *Despropyl Atrazine *Diamino Atrazine	Not available	Not available	Cardiovascular system or reproductive problems.	Herbicide
Bromacil	300	LHA	Possible human carcinogen.	Herbicide
Carbon tetrachloride (CTC)	5	MCL	Liver problems; increased risk of cancer.	Solvent, dry cleaning agent
Chlordane	2	MCL	Liver or nervous system problems; increased risk of cancer.	Pesticide (termiticide)
1,2 Dibromo 3-chloropropane (DBCP)	0.04	SMCL	Reproductive difficulties; increased risk of cancer.	Pesticide (soil fumigant)
1,2-Dichloropropane (DCP)	5	MCL	Increased risk of cancer.	Pesticide, solvent
Dieldrin	0.2	10 –4	Central nervous system; liver and kidney damage.	Pesticide
Diuron	10	LHA	Central nervous system depression; damaged red blood cells causing spleen damage; altered fetal development.	Herbicide
Ethylene dibromide (EDB)	0.04	SMCL	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer.	Gas additive, soil fumigant, solvent
Hexazoinoie	400	LHA	Reduced body weight or possibly reduced growth.	Herbicide
Isophorone	100	LHA	No studies on developmental or reproductive effects in humans.	Solvent, herbicide, pesticide

* Breakdown product of atrazine

Lindane	0.2	MCL	Nerve damage and central nervous system seizures; liver and kidney damage; suppression of immune system.	Insecticide
Simazine	4	MCL	Liver, kidney and brain damage	Herbicide
Tetrachloroethylene (PCE)	5	MCL	Liver problems; increased risk of cancer.	Solvent, dry cleaning agent
Trichloroethylene (TCE)	5	MCL	Central nervous system depression; liver and kidney damage.	Solvent
1,2,3-Trichloropropane (TCP)	0.6	SMCL	Decreased red blood cells; liver and kidney damage.	Solvent, trace contaminant in certain pesticides
1,2,4-Trichlorobenzene	70	MCL	Changes in adrenal glands.	Herbicide, solvent, termiticide

Definitions of Applicable Drinking Water Standards

Lifetime Health Advisory (LHA) – This 2004 EPA advisory describes a non-regulatory concentration of a drinking water contaminant at which health effects would not be anticipated to occur over a lifetime exposure of 70 years duration. The advisories are based on data describing non-carcinogenic risk from exposure. This is a non-regulatory standard.

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

Maximum Contaminant Level Goal (MCLG) – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

State Maximum Contaminant Level (SMCL) – The State maximum contaminant level (SMCL) may be more stringent than the EPA's maximum contaminant level (MCL) of a contaminant in water as defined in Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 20, Rules Relating to Potable Water Systems.

10-4 – This number refers to EPA's estimate of a "cancer risk level" of one-in-ten-thousand chance of developing cancer as a direct result of drinking water containing the contaminant over a lifetime of 70 years. This is a non-regulatory standard.