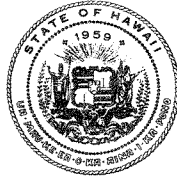


LINDA LINGLE
GOVERNOR OF HAWAII



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

STATE OF HAWAII
DEPARTMENT OF HEALTH

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

July 28, 2006

In reply, please refer to:
EMD/SDWB

To All Interested Parties:

SUBJECT: 2005 GROUNDWATER CONTAMINATION MAPS
FOR THE STATE OF HAWAII

The Department of Health has been periodically updating and printing the Groundwater Contamination Maps for the State of Hawai'i since August 1989. These maps identify locations where organic and other chemical contaminants have been detected and confirmed in drinking water wells, select non-potable wells, and fresh water springs throughout the state.

Most of the detected contaminant levels reported in the maps are below existing Federal and State drinking water standards established for public health protection. If a contaminant exceeds the standard, appropriate public health protection measures are implemented to make the water safe for human consumption. Federal and State Drinking Water Standards as well as health advisories (health effects related to the contaminants) accompany the 2005 Groundwater Contamination Maps and are located at the end of the report.

The maps and tables present data that were collected between January and December 2005 and include historical monitoring information as well. Positive results are considered confirmed when verified by a follow-up test or by comparison with historical data. Historical information is included until new information confirms that concentrations have decreased to non-detectable levels.

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 L. Fukino".

Chiyome Leinaala Fukino, M.D.
Director of Health

Enclosures

**State of Hawai`i
Department of Health
Groundwater Contamination Maps
2005**

The 2005 Groundwater Contamination Maps for the State of Hawai`i are the tenth 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 2005 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 current information available to the DOH between January 1, 2005, through December 31, 2005, and are based on monitoring data for public drinking water wells, select non-potable wells, fresh water springs, and other testing data available to the DOH.

What do these Maps represent?

The 2005 Maps identify **organic and other chemical contaminants that have been detected and confirmed in drinking water wells, select non-potable wells, and fresh water springs** 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 2005 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. All new contaminant levels are below the Maximum Contaminant Levels (MCLs) established by the Federal Environmental Protection Agency (EPA) as part of the Federal Drinking Water Standards¹.

New contaminant(s) were found in the following wells on O`ahu in 2005.

Map #22	Kunia I, Pump 3 (Well #2302-03)	TCE
Map #27	Kunia II, Pump 3 (Well #2402-03)	DCP

MTBE detected in Wahiawa Well II, Pump 2 (Well #2902-02) in 2004 was not detected in 2005.

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 2005 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 wells, well fields (an area where many wells in proximity share the same groundwater source), and fresh water springs with current and historical monitoring information.

The tables include information about the contaminated well or spring, such as the use of the well (e.g. drinking water, irrigation, industrial or inactive), the contaminant(s)

¹ Federal and State Drinking Water Standards and Health Advisories are listed at the end of this report, including acronyms.

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.

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.

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

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 Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 20, Rules Relating to Potable Water Systems.

Current Information: latest chemical contaminant information on drinking water wells primarily. For many irrigation and inactive wells, the latest contaminant information may date as far back as 1995.

Current Spring Information: latest chemical contaminant information on fresh water springs. For some springs, the latest contaminant information may date as far back as 1995.

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.

Historical Monitoring Data: chemical contaminant information detected before 1995, and no subsequent contamination information is available, for wells.

Historical Spring Monitoring Data: chemical contaminant information detected before 1995, and no subsequent contamination information is available, for springs.

IND: industrial well.

IRR: irrigation well.

Inactive: a well that is no longer in service.

ND: “non-detectable,” no presence of a contaminant at, or above, 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,” below 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.

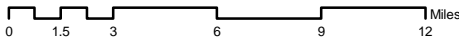
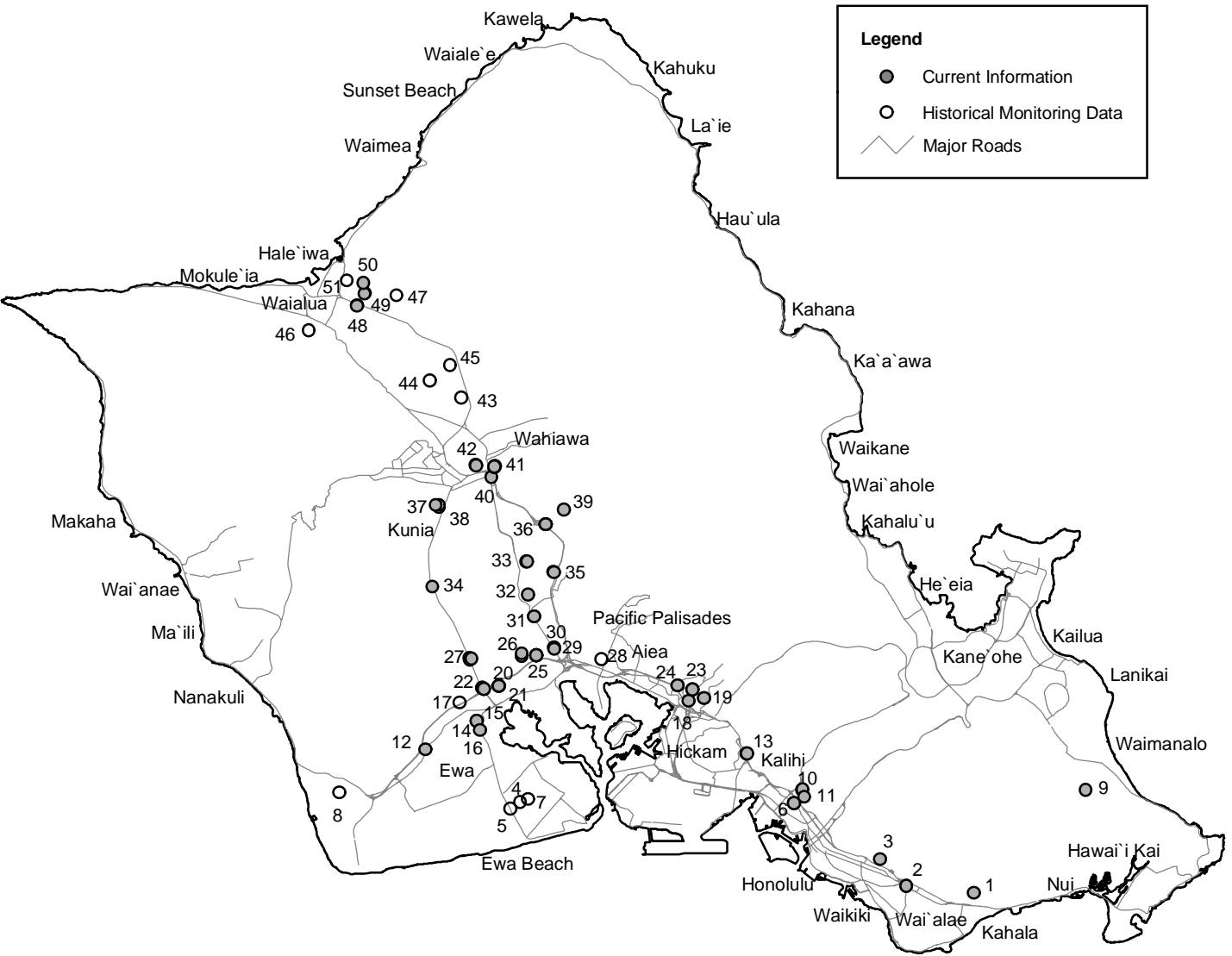
PCE Detection Levels: The Hawai`i State Laboratory method to detect PCE (tetrachloroethylene) at .01 parts per billion (micrograms/liter) was not an EPA- approved method in 1985. Hawai`i’s detection method was later changed to an EPA-approved method with a detection level of 0.2 parts per billion.

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.

Well Number: 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.

ISLAND OF O`AHU 2005 GROUNDWATER CONTAMINATION



Hawai'i State Department of Health
July 2006

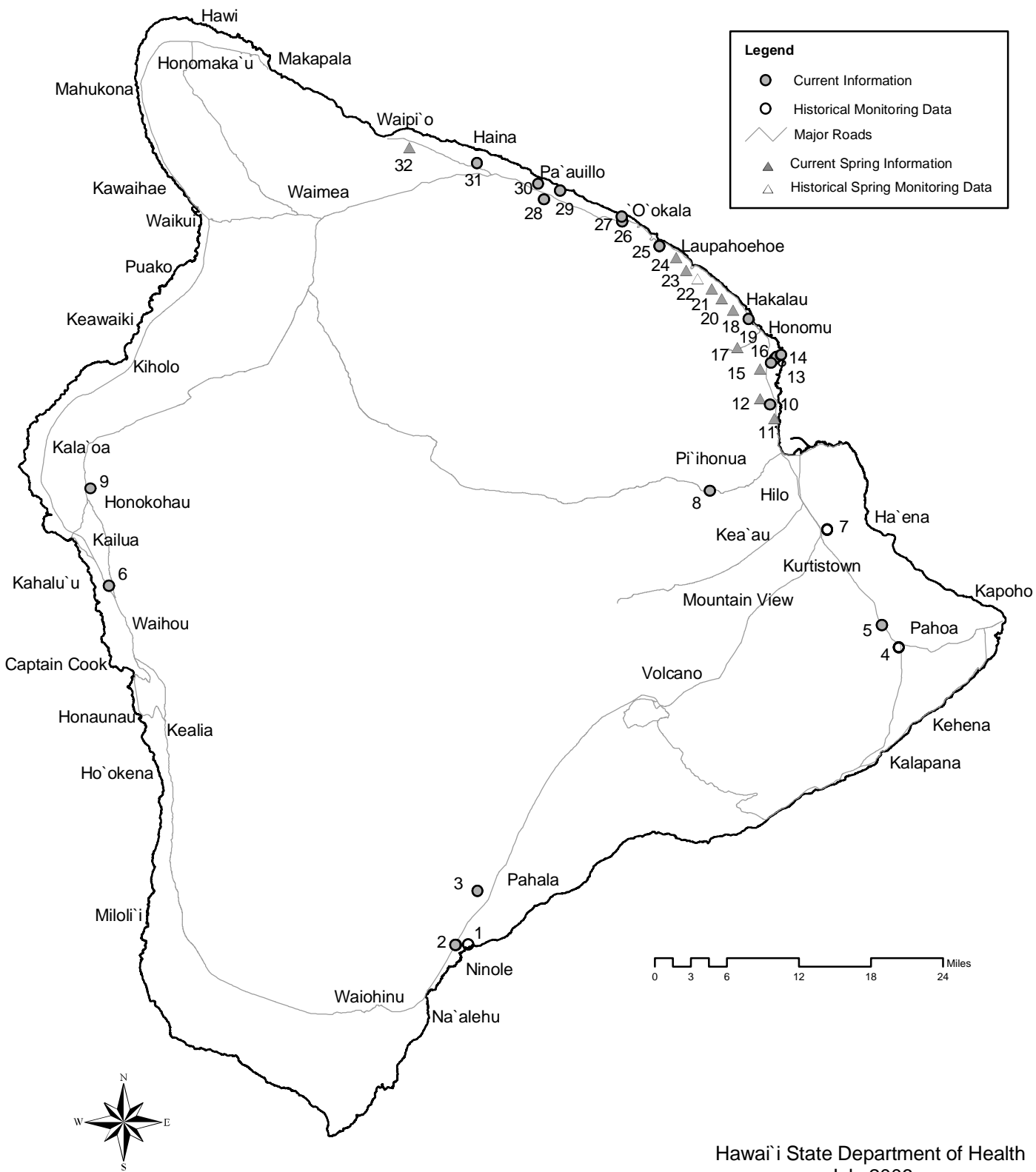
O`AHU 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	1746-01	Ainakoa Well	DW	Dieldrin	0.02	08/17/05
2	1748-HS	Kaimuki Station Wells	DW	Dieldrin	0.02	08/25/05
2	1748-LS	Kaimuki Station Wells	DW	Dieldrin	0.03	11/14/05
2	1748-03-10	Kaimuki Station Wells	DW	PCE	0.03	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	0.01	10/26/05
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	0.02	11/09/05
6	1952-LS	Kalihi Station Wells	DW	Dieldrin	0.02	11/09/05
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	2006-01-11	OSCO Ewa Pump 10	Inactive	Atrazine	NQ <0.1	11/17/92
8	2006-01-11	OSCO Ewa Pump 10	Inactive	Desethyl Atrazine	0.15	11/17/92
9	2043-02	Waimanalo Well 1	Inactive	Alachlor	0.53	01/27/98
10	2052-07	Kamehameha School Well 1	Inactive	Chlordane	NQ <0.3	04/01/98
10	2052-07	Kamehameha School Well 1	Inactive	Dieldrin	0.05	11/16/98
10	2052-11	Kamehameha School Well 2	Inactive	Chlordane	0.4	01/30/97
10	2052-11	Kamehameha School Well 2	Inactive	Dieldrin	0.02	10/23/96
11	2052-12	Jonathan Springs Well	Inactive	Chlordane	0.3	11/08/95
11	2052-12	Jonathan Springs Well	Inactive	Dieldrin	0.06	11/08/95
12	2103-03	Barbers Point Shaft	DW	Atrazine	0.06	11/16/05
12	2103-03	Barbers Point Shaft	DW	Desethyl Atrazine	0.12	11/10/03
13	2153-10	Moanalua Wells P1	DW	Dieldrin	0.02	08/25/05
13	2153-11	Moanalua Wells P2	DW	Dieldrin	0.01	05/17/05
14	2202-03	OSCO Ewa Pump 3	IRR	Atrazine	NQ <0.05	11/10/03
14	2202-03	OSCO Ewa Pump 3	IRR	Desethyl Atrazine	0.12	11/10/03
15	2202-05	OSCO Pump 5	IRR	Atrazine	0.07	11/10/03
15	2202-05	OSCO Pump 5	IRR	Desethyl Atrazine	0.08	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	0.01	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

O`AHU 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
18	2255-32	Halawa Plant (Navy)	DW	Chlordane	0.3	04/13/05
18	2255-32	Halawa Plant (Navy)	DW	Dieldrin	0.02	11/16/05
19	2255-37	BWS Halawa Well 2	DW	Dieldrin	0.04	04/07/04
19	2255-39	BWS Halawa Well 1	DW	Dieldrin	0.02	11/09/05
20	2301-34	Hoaeae, P1	DW	TCP	0.21	10/27/05
20	2301-35	Hoaeae, P2	DW	TCP	0.20	11/01/05
20	2301-36	Hoaeae, P4	DW	Atrazine	0.07	04/13/05
20	2301-36	Hoaeae, P4	DW	Desethyl Atrazine	NQ<0.05	11/03/03
20	2301-36	Hoaeae, P4	DW	Dieldrin	0.01	10/27/05
20	2301-36	Hoaeae, P4	DW	TCP	0.32	10/27/05
20	2301-37	Hoaeae, P3	DW	Atrazine	0.76	04/14/05
20	2301-37	Hoaeae, P3	DW	Dieldrin	0.01	10/27/05
20	2301-37	Hoaeae, P3	DW	TCP	0.40	10/27/05
20	2301-38	Hoaeae, P5	DW	TCP	0.23	11/01/05
20	2301-39	Hoaeae, P6	DW	TCP	0.15	10/27/05
21	2301-40	Kunia III, P1 (before)	DW	TCP	0.12	10/14/05
21	2301-41	Kunia III, P2 (before)	DW	TCP	0.10	10/27/05
21	2301-42	Kunia III, P3 (before)	DW	TCP	0.21	10/14/05
22	2302-01	Kunia Wells I, P1 (before)	DW	TCP	0.69	10/06/03
22	2302-02	Kunia Wells I, P2 (before)	DW	Desethyl Atrazine	0.09	11/10/03
22	2302-02	Kunia Wells I, P2 (before)	DW	TCE	NQ<0.5	08/05/05
22	2302-02	Kunia Wells I, P2 (before)	DW	TCP	0.48	10/27/05
22	2302-03	Kunia Wells I, P3 (before)	DW	TCE	NQ<0.5	08/08/05
22	2302-03	Kunia Wells I, P3 (before)	DW	TCP	0.29	11/04/05
22	2302-04	Kunia Wells I, P4 (before)	DW	Atrazine	0.05	03/15/05
22	2302-04	Kunia Wells I, P4 (before)	DW	TCE	NQ<0.5	07/27/04
22	2302-04	Kunia Wells I, P4 (before)	DW	TCP	0.34	10/27/05
23	2355-06	Aiea Well Pump 1	DW	Dieldrin	0.04	11/09/05
23	2355-07	Aiea Well Pump 2	DW	Dieldrin	0.03	11/09/05
24	2356-59	Kaamilo Wells	DW	Dieldrin	0.01	05/17/05
24	2356-58 & 59	Kaamilo Wells	DW	PCE	0.03	04/20/85
25	2400-01	Waipahu I, P2 (before)	DW	EDB	NQ<0.04	11/03/05
25	2400-01	Waipahu I, P2 (before)	DW	TCE	NQ<0.5	07/13/05
25	2400-01	Waipahu I, P2 (before)	DW	TCP	0.40	11/03/05
25	2400-02	Waipahu I, P1 (before)	DW	EDB	NQ<0.04	07/12/05
25	2400-02	Waipahu I, P1 (before)	DW	TCE	NQ<0.5	07/15/05
25	2400-02	Waipahu I, P1 (before)	DW	TCP	0.50	07/12/05
25	2400-03	Waipahu I, P4 (before)	DW	EDB	NQ<0.04	04/14/99
25	2400-03	Waipahu I, P4 (before)	DW	TCP	NQ<0.5	04/14/99
25	2400-04	Waipahu I, P3 (before)	DW	EDB	NQ<0.04	11/03/05
25	2400-04	Waipahu I, P3 (before)	DW	TCE	NQ<0.5	11/28/05
25	2400-04	Waipahu I, P3 (before)	DW	TCP	0.40	11/03/05
26	2400-05	Waipahu II P1 (before)	DW	TCP	0.35	10/14/05
26	2400-06	Waipahu II P2 (before)	DW	TCP	0.54	10/14/05
26	2400-08	Waipahu II P3 (before)	DW	TCP	0.25	10/14/05
27	2402-01	Kunia Wells II, P1 (before)	DW	DBCP	NQ<0.04	07/20/01
27	2402-01	Kunia Wells II, P1 (before)	DW	TCE	NQ<0.5	07/20/01
27	2402-01	Kunia Wells II, P1 (before)	DW	TCP	1.0	07/20/01
27	2402-02	Kunia Wells II, P2 (before)	DW	DCP	NQ<1.0	03/02/04
27	2402-02	Kunia Wells II, P2 (before)	DW	TCE	NQ<0.5	11/30/05
27	2402-02	Kunia Wells II, P2 (before)	DW	TCP	0.48	11/17/05

O`AHU 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
27	2402-03	Kunia Wells II, P3 (before)	DW	DCP	NQ<1.0	08/18/05
27	2402-03	Kunia Wells II, P3 (before)	DW	TCE	NQ<0.5	11/30/05
27	2402-03	Kunia Wells II, P3 (before)	DW	TCP	0.44	11/17/05
27	2402-04	Kunia Wells II, P4 (before)	DW	DCP	NQ<1.0	08/18/05
27	2402-04	Kunia Wells II, P4 (before)	DW	TCE	NQ<0.5	11/30/05
27	2402-04	Kunia Wells II, P4 (before)	DW	TCP	1.43	11/04/05
28	2458-01	Pearl City Shaft (Manana)	DW	PCE	0.03	4/18/85*
28	2458-01	Pearl City Shaft (Manana)	DW	TCP	0.04	07/07/05
				*ND after this date. PCE detection levels raised from 0.01 ppb to 0.2 ppb.		
29	2459-19	Waipio Hts P2	DW	TCP	0.13	11/16/05
29	2459-20	Waipio Hts P1	DW	TCP	0.12	11/16/05
30	2459-23	Waipio Hts I, P1	DW	TCP	0.20	01/26/05
30	2459-24	Waipio Hts I, P2	DW	TCP	0.19	01/16/03
31	2500-01	Waipio Hts. II, P1	DW	TCE	0.60	12/16/04
31	2500-01	Waipio Hts. II, P1	DW	TCP	0.50	12/07/04
31	2500-02	Waipio Hts. II, P2	DW	TCP	0.83	10/18/04
32	2600-02	Dairy Co. (Kipapa Acres)	DW	TCE	NQ<0.5	07/19/05
32	2600-02	Dairy Co. (Kipapa Acres)	DW	TCP	0.46	12/01/05
33	2600-03	Mililani III, P7 (before)	DW	DBCP	0.07	11/08/05
33	2600-03	Mililani III, P7 (before)	DW	DCP	NQ<1.0	08/24/05
33	2600-03	Mililani III, P7 (before)	DW	TCP	0.99	11/08/05
33	2600-04	Mililani III, P8 (before)	DW	DBCP	0.09	07/18/02
33	2600-04	Mililani III, P8 (before)	DW	DCP	NQ<1.0	07/18/02
33	2600-04	Mililani III, P8 (before)	DW	TCP	2.29	07/18/02
34	2603-01	Hawaii Country Club (before)	DW	DBCP	0.04	12/02/05
34	2603-01	Hawaii Country Club (before)	DW	EDB	NQ<0.04	12/02/05
34	2603-01	Hawaii Country Club (before)	DW	TCP	0.17	12/02/05
35	2659-02	Waipio Hts III, P2	DW	EDB	NQ<0.04	10/14/04
35	2659-02	Waipio Hts III, P2	DW	TCP	0.20	11/14/05
35	2659-03	Waipio Hts III, P1	DW	EDB	NQ<0.04	11/16/05
35	2659-03	Waipio Hts III, P1	DW	TCP	0.49	11/16/05
36	2800-01	Mililani I, P1 (before)	DW	DBCP	0.12	11/08/05
36	2800-01	Mililani I, P1 (before)	DW	DCP	NQ<1.0	12/02/05
36	2800-01	Mililani I, P1 (before)	DW	TCP	3.37	11/08/05
36	2800-02	Mililani I, P2 (before)	DW	DBCP	0.06	11/03/05
36	2800-02	Mililani I, P2 (before)	DW	DCP	NQ<1.0	12/01/05
36	2800-02	Mililani I, P2 (before)	DW	TCP	0.91	11/03/05
36	2800-03	Mililani I, P3 (before)	DW	DBCP	0.06	11/03/05
36	2800-03	Mililani I, P3 (before)	DW	DCP	NQ<1.0	12/12/05
36	2800-03	Mililani I, P3 (before)	DW	TCP	1.27	11/03/05
36	2800-04	Mililani I, P4 (before)	DW	DBCP	0.27	11/03/05
36	2800-04	Mililani I, P4 (before)	DW	DCP	NQ<1.0	12/12/05
36	2800-04	Mililani I, P4 (before)	DW	TCP	3.26	11/03/05
37	2803-03-04	Kunia Battery	IND	Atrazine	NQ<0.05	09/28/93
37	2803-03-04	Kunia Battery	IND	Desethyl Atrazine	NQ<0.05	09/30/92
37	2803-03-04	Kunia Battery	IND	PCE	1.65	04/23/85
37	2803-03-04	Kunia Battery	IND	TCE	3.70	07/24/85
38	2803-05	Del Monte Kunia 3 (before)	DW	CTC	NQ<0.5	12/02/05
38	2803-05	Del Monte Kunia 3 (before)	DW	DCP	NQ<1.0	12/02/05

O`AHU 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
38	2803-05	Del Monte Kunia 3 (before)	DW	PCE	NQ<0.5	12/02/05
38	2803-05	Del Monte Kunia 3 (before)	DW	TCE	3.10	12/02/05
38	2803-05	Del Monte Kunia 3 (before)	DW	TCP	0.22	12/02/05
38	2803-07	Del Monte Kunia 4 (before)	DW	CTC	NQ<0.5	02/28/05
38	2803-07	Del Monte Kunia 4 (before)	DW	TCE	1.1	08/26/05
38	2803-07	Del Monte Kunia 4 (before)	DW	TCP	0.22	08/26/05
39	2859-01	Mililani II, P5 (before)	DW	DBCP	0.12	02/03/03
39	2859-01	Mililani II, P5 (before)	DW	TCP	2.13	02/03/03
39	2859-02	Mililani II, P6 (before)	DW	DBCP	0.08	11/08/05
39	2859-02	Mililani II, P6 (before)	DW	TCP	0.70	11/08/05
40	2901-02	Schofield Battery (before)	DW	PCE	0.6	12/05/05
40	2901-02	Schofield Battery (before)	DW	TCE	23.4	12/05/05
41	2901-08	Wahiawa Wells 1, P3	DW	CTC	0.6	02/20/04
41	2901-08	Wahiawa Wells 1, P3	DW	PCE	1.60	02/20/04
41	2901-11	Wahiawa Wells 1, P1	DW	CTC	NQ<0.5	12/05/05
41	2901-11	Wahiawa Wells 1, P1	DW	PCE	0.8	12/05/05
41	2901-11	Wahiawa Wells 1, P1	DW	TCE	NQ<0.5	12/05/05
41	2901-12	Wahiawa Wells 1, P2	DW	CTC	0.6	11/04/04
41	2901-12	Wahiawa Wells 1, P2	DW	PCE	1.0	11/04/04
42	2902-01	Wahiawa Wells II, P1	DW	CTC	NQ<0.5	11/04/04
42	2902-01	Wahiawa Wells II, P1	DW	PCE	0.7	11/04/04
42	2902-01	Wahiawa Wells II, P1	DW	TCP	0.12	11/04/04
42	2902-02	Wahiawa Wells II, P2	DW	CTC	NQ<0.5	08/15/05
42	2902-02	Wahiawa Wells II, P2	DW	PCE	1.5	08/15/05
42	2902-02	Wahiawa Wells II, P2	DW	TCP	0.13	08/15/05
43	3102-02	Waiialua Sugar P24	IRR	DBCP	0.02	08/20/84
43	3102-02	Waiialua Sugar P24	IRR	TCP	0.50	06/03/85
44	3203-01	Waiialua Sugar P25	IRR	DBCP	0.12	06/07/83
45	3203-02	Waiialua Sugar P26	IRR	DBCP	0.01	06/03/85
45	3203-02	Waiialua Sugar P26	IRR	TCP	0.80	06/03/85
46	3307-01	Waiialua Battery P2	DW	Atrazine	0.12	11/04/92
46	3307-01	Waiialua Battery P2	DW	Desethyl Atrazine	0.15	11/14/92
47	3404-02	Waiialua Sugar P17	IRR	DBCP	0.06	11/09/93
47	3404-02	Waiialua Sugar P17	IRR	TCP	1.10	11/09/93
48	3405-01	Waiialua Wells P1	DW	TCE	NQ<0.5	12/05/05
48	3405-01	Waiialua Wells P1	DW	TCP	0.24	11/21/05
48	3405-02	Waiialua Wells P2	DW	TCE	NQ<0.5	12/05/05
48	3405-02	Waiialua Wells P2	DW	TCP	0.28	11/21/05
49	3405-03	Haleiwa Well P1	DW	DBCP	NQ<0.04	12/15/04
49	3405-03	Haleiwa Well P1	DW	TCE	0.5	12/15/04
49	3405-03	Haleiwa Well P1	DW	TCP	0.62	12/15/04
49	3405-04	Haleiwa Well P2	DW	DBCP	NQ<0.04	12/15/04
49	3405-04	Haleiwa Well P2	DW	TCE	0.5	12/15/04
49	3405-04	Haleiwa Well P2	DW	TCP	NQ<0.04	12/15/04
50	3505-01-20	Waiialua Sugar P3	Inactive	DBCP	NQ<0.04	07/24/97
50	3505-01-20	Waiialua Sugar P3	Inactive	TCP	NQ<0.5	07/24/97
51	3506-03	Haleiwa Battery	IRR	Atrazine	0.13	11/04/92
51	3506-03	Haleiwa Battery	IRR	Lindane	0.01	11/12/87

ISLAND OF HAWAI'I 2005 GROUNDWATER CONTAMINATION



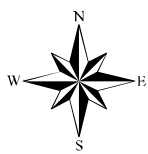
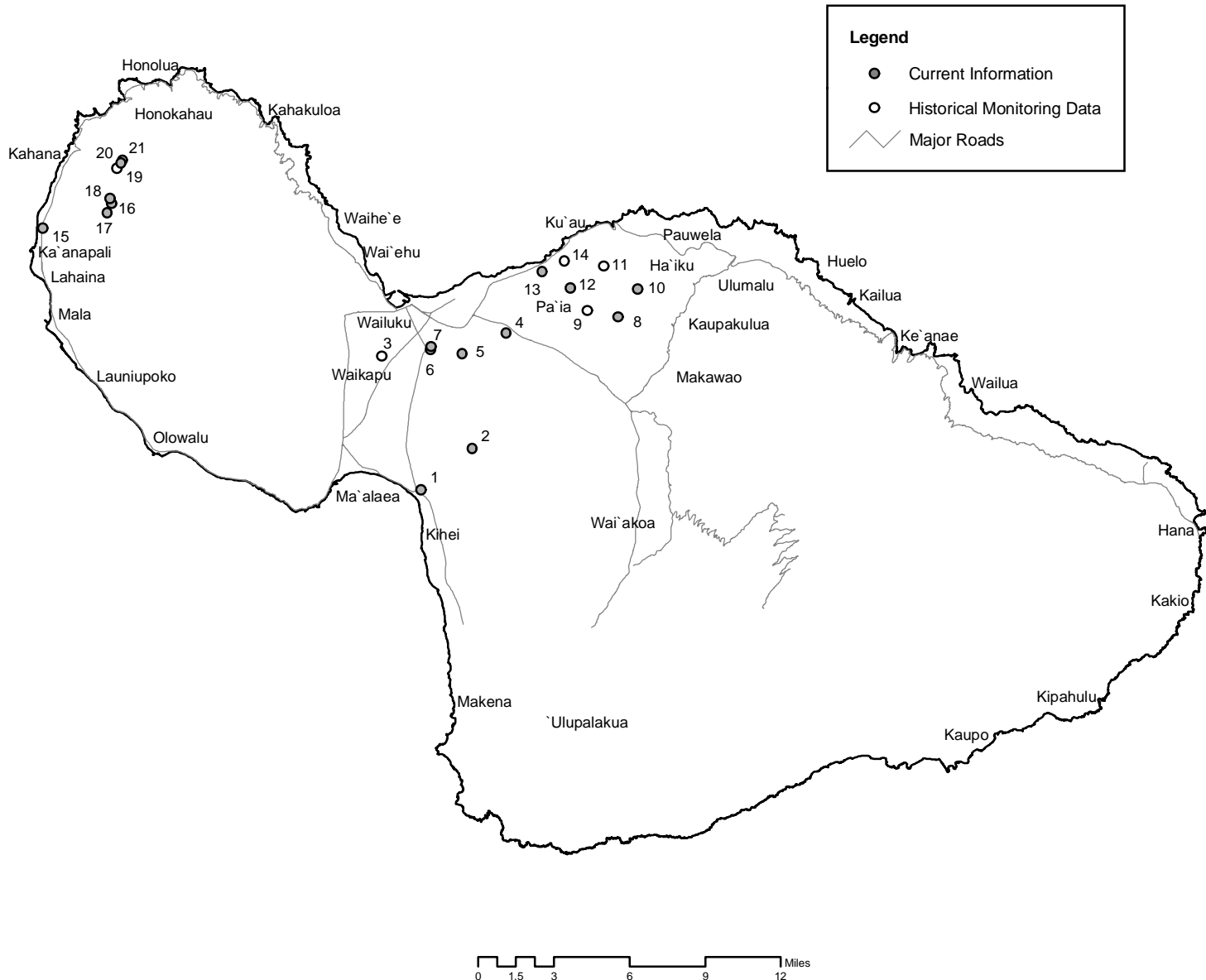
Hawai'i State Department of Health
July 2006

HAWAII 2005 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	0.11	04/12/05
2	0831-02	Ninole A	DW	Desethyl Atrazine	0.13	01/13/04
2	0831-03	Ninole B	DW	Atrazine	0.10	04/12/05
2	0831-03	Ninole B	DW	Desethyl Atrazine	0.11	01/13/04
3	1229-01	Pahala Well	DW	Atrazine	0.06	06/29/05
3	1229-01	Pahala Well	DW	Desethyl Atrazine	0.14	01/13/04
4	2986-01	Pahoa Well 1	DW	Diuron	0.8	08/05/91
4	2986-02	Pahoa Well 2	DW	Diuron	0.8	08/05/91
5	3188-02	Keonepoko Nui 2	DW	Isophorone	0.5	04/24/01
6	3557-02	Kahaluu Well B	Inactive	Isophorone	0.8	08/04/98
7	3802-03-04	Keaau	IND	Ametryne	0.88	02/27/84
7	3802-03-04	Keaau	IND	Atrazine	0.26	02/27/84
8	4110-01	Saddle Road Well A	DW	Isophorone	0.58	11/04/03
9	4258-03	Hualalai Well	DW	Isophorone	0.6	08/07/00
10	4706-01	Papaikou Deep Well	DW	Atrazine	0.20	9/5/03*
10	4706-01	Papaikou Deep Well	DW	Simazine	0.05	9/5/03"
11	4708-99	Papaikou Spring	DW	Atrazine	0.20	9/5/03*
11	4708-99	Papaikou Spring	DW	Simazine	0.26	01/13/04
12	4708-99	Kaieie Spring	DW	Atrazine	0.11	06/29/05
12	4708-99	Kaieie Spring	DW	Desethyl Atrazine	0.52	12/09/03
12	4708-99	Kaieie Spring	DW	Simazine	0.05	9/5/03*
13	5005-01	Pepeekeo Sugar Makai	Inactive	Atrazine	NQ<0.5	01/22/96
13	5005-01	Pepeekeo Sugar Makai	Inactive	Desethyl Atrazine	0.80	12/14/93
13	5005-01	Pepeekeo Sugar Makai	Inactive	Diuron	0.5	08/05/91
13	5005-01	Pepeekeo Sugar Makai	Inactive	Hexazinone	0.3	08/05/91
13	5005-02	Pepeekeo Sugar	Inactive	Atrazine	0.26	12/08/03
13	5005-02	Pepeekeo Sugar	Inactive	Desethyl Atrazine	0.26	12/08/03
13	5005-02	Pepeekeo Sugar	Inactive	Diuron	0.80	08/05/91
14	5005-03	HCPC Makai Well 2	Inactive	Atrazine	0.30	12/08/03
14	5005-03	HCPC Makai Well 2	Inactive	Desethyl Atrazine	0.29	12/08/03
14	5005-04	HCPC Makai Well	Inactive	Atrazine	0.30	12/08/03
14	5005-04	HCPC Makai Well	Inactive	Desethyl Atrazine	0.29	12/08/03
15	5006-99	Maukaloa Spring	DW	Atrazine	0.11	04/19/04
15	5006-99	Maukaloa Spring	DW	Desethyl Atrazine	0.09	12/09/03
15	5006-99	Maukaloa Spring	DW	Deisopropyl Atrazine	0.08	12/09/03
15	5006-99	Maukaloa Spring	DW	Simazine	0.05	12/09/03
16	5006-01	Kulaimano Deep Well	DW	Atrazine	0.09	06/29/05
16	5006-01	Kulaimano Deep Well	DW	Desethyl Atrazine	0.13	12/08/03
16	5006-01	Kulaimano Deep Well	DW	Diuron	0.6	08/05/91
16	5006-01	Kulaimano Deep Well	DW	Simazine	0.05	9/5/03*

*Composite

HAWAII 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected	Date
17	5109-99	Akaka Falls Spring	DW	Atrazine	0.10	9/5/03*
						*Composite
18	5210-99	Hakalau Well & Iki Spring	DW	Atrazine	0.01	04/13/05
19	5307-01	Hakalau Well	DW	Atrazine	0.21	11/15/05
19	5307-01	Hakalau Well	DW	Desethyl Atrazine	0.46	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	5610-99	Chaves Spring	DW	Atrazine	0.11	06/29/05
20	5610-99	Chaves Spring	DW	Desethyl Atrazine	0.14	12/09/03
21	5611-99	Kaiaakea Spring	Inactive	Atrazine	0.14	12/09/03
21	5611-99	Kaiaakea Spring	Inactive	Desethyl Atrazine	0.10	12/09/03
22	5613-99	Kihalani Spring	Inactive	Hexazinone	0.57	09/09/86
23	5713-99	Papaaloa Spring	Inactive	Atrazine	0.56	02/28/95
24	5814-99	Manowaiopae Spring	Inactive	Atrazine	0.13	6/6/2002**
						** Composite with Laupahoehoe
25	5814-01	Laupahoehoe Well 1	DW	Atrazine	0.10	3/30/2005**
25	5814-01	Laupahoehoe Well 1	DW	Desethyl Atrazine	0.13	12/16/03
25	5814-02	Laupahoehoe Well 2	DW	Atrazine	0.13	03/30/05
25	5814-02	Laupahoehoe Well 2	DW	Desethyl Atrazine	0.17	12/16/03
				**Composite w/Manowaiopae replaced by newer results.		
26	6017-05	Ookala Well	DW	Atrazine	0.15	06/29/05
26	6017-05	Ookala Well	DW	Desethyl Atrazine	0.93	12/16/03
26	6017-05	Ookala Well	DW	Hexazinone	0.24	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	0.60	09/11/96
27	6117-01	Ookala Shaft	Inactive	Desethyl Atrazine	1.00	01/12/93
27	6117-01	Ookala Shaft	Inactive	Deisopropyl Atrazine	0.16	01/12/93
27	6117-01	Ookala Shaft	Inactive	Diamino Atrazine	0.15	01/12/93
28	6223-01	Paauilo Well	DW	Atrazine	0.48	11/15/05
28	6223-01	Paauilo Well	DW	Desethyl Atrazine	1.14	12/16/03
28	6223-01	Paauilo Well	DW	Deisopropyl Atrazine	0.05	12/16/03
28	6223-01	Paauilo Well	DW	Diamino Atrazine	0.05	12/16/03
28	6223-01	Paauilo Well	DW	Hexazinone	0.24	12/16/03
28	6223-01	Paauilo Well	DW	Isophorone	0.7	7/26/00***
						***Composite with Ookala
29	6321-02	Paauilo Shaft	Inactive	Atrazine	0.59	02/28/95
29	6321-02	Paauilo Shaft	Inactive	Hexazinone	1.1	09/09/86
30	6323-01	Big Island Meat	Inactive	Atrazine	0.27	12/15/03
30	6323-01	Big Island Meat	Inactive	Desethyl Atrazine	0.39	12/15/03
30	6323-01	Big Island Meat	Inactive	Hexazinone	0.31	12/15/03
31	6528-01	Haina Well	DW	Atrazine	0.21	11/15/05
31	6528-01	Haina Well	DW	Desethyl Atrazine	0.60	12/08/03
31	6528-01	Haina Well	DW	Hexazinone	0.15	12/08/03
32	6734-99	Waiuliuli Spring	DW	Atrazine	0.11	06/29/05
32	6734-99	Waiuliuli Spring	DW	Desethyl Atrazine	0.17	12/15/03

ISLAND OF MAUI 2005 GROUNDWATER CONTAMINATION

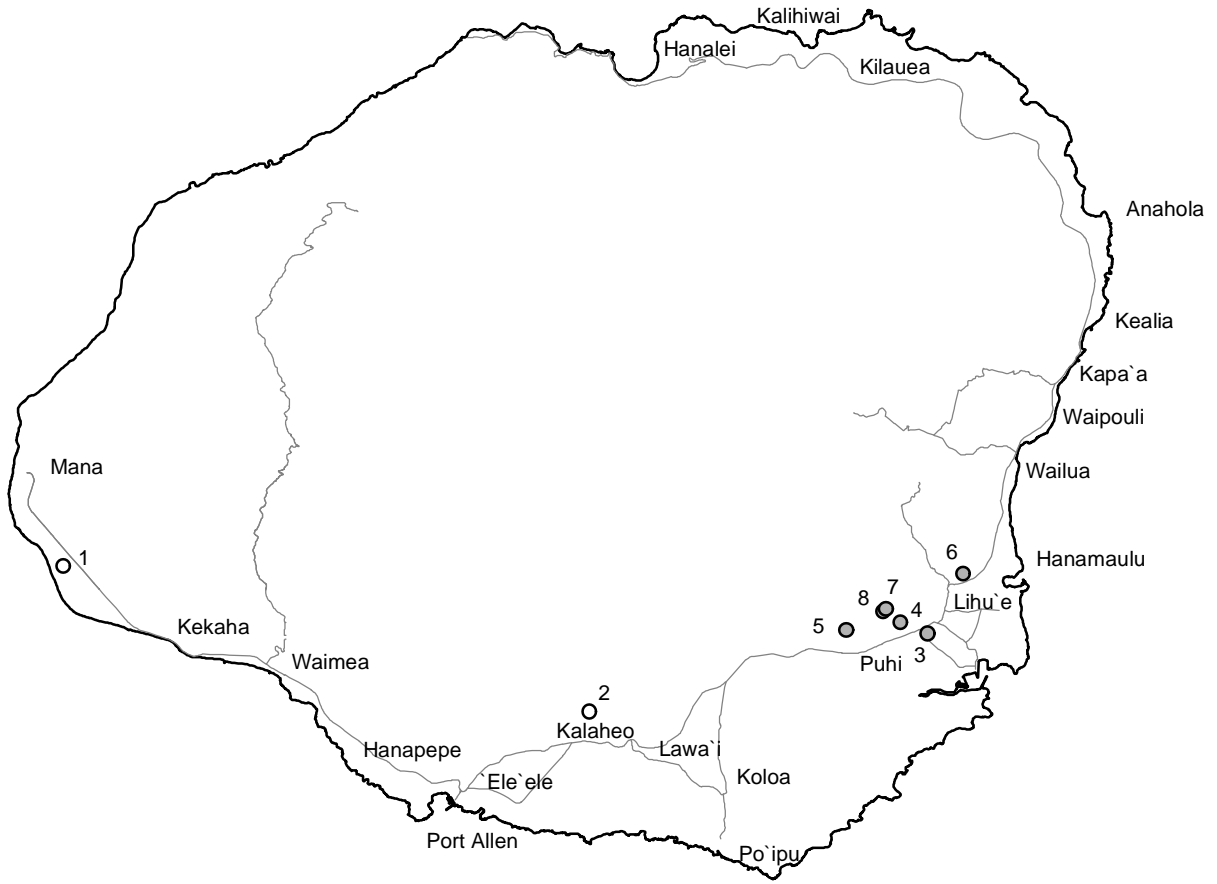


Hawai'i State Department of Health
July 2006

MAUI 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	4727-01	Kihei Well 1	IRR	Atrazine	0.12	11/24/03
1	4727-01	Kihei Well 1	IRR	Desethyl Atrazine	0.24	11/24/03
1	4727-01	Kihei Well 1	IRR	Diamino Atrazine	0.07	11/24/03
2	4825-01	Kihei Well 3	IRR	Atrazine	0.05	11/24/03
2	4825-01	Kihei Well 3	IRR	Desethyl Atrazine	0.14	11/24/03
3	5129-01	Reynolds Well #1	Inactive	DBCP	NQ<0.04	02/16/93
4	5224-02	Puunene Pump 9	IRR	Desethyl Atrazine	0.06	11/24/03
5	5226-02	Puunene Pump 6	IRR	Atrazine	0.08	11/24/03
5	5226-02	Puunene Pump 6	IRR	Desethyl Atrazine	0.10	11/24/03
6	5227-04	Puunene Pump 7A	IND	Desethyl Atrazine	0.09	11/25/03
6	5227-04	Puunene Pump 7A	IND	EDB	0.04	03/12/85
7	5227-05	Puunene Mill Pump 19	IRR	Atrazine	0.08	11/24/03
7	5227-05	Puunene Mill Pump 19	IRR	Desethyl Atrazine	0.13	11/24/03
8	5320-02	Maunaolu-Smith Well	DW	DBCP	NQ<0.04	11/03/04
8	5320-02	Maunaolu-Smith Well	DW	EDB	0.19	10/20/05
8	5320-02	Maunaolu-Smith Well	DW	TCE	NQ<0.5	11/29/05
8	5320-02	Maunaolu-Smith Well	DW	TCP	0.85	10/20/05
9	5321-01	Kaheka #18	IRR	DBCP	0.02	08/16/89
9	5321-01	Kaheka #18	IRR	EDB	0.05	08/16/89
9	5321-01	Kaheka #18	IRR	TCP	0.13	08/16/89
10	5419-01	Haiku	DW	TCP	0.15	08/10/05
11	5420-01	Maui High School	IRR	DBCP	0.09	03/04/85
11	5420-01	Maui High School	IRR	EDB	0.07	03/04/85
11	5420-01	Maui High School	IRR	TCP	0.43	03/04/85
12	5422-02	Paia #7	IRR	Atrazine	0.23*	03/11/97
12	5422-02	Paia #7	IRR	EDB	0.03	03/04/85
13	5423-02	Paia #16	IRR	Atrazine	0.10*	3/17/98
13	5423-02	Paia #16	IRR	Atrazine	NQ<0.05	11/25/03
13	5423-02	Paia #16	IRR	Bromacil	0.42	11/25/03
13	5423-02	Paia #16	IRR	Desethyl Atrazine	0.09	11/25/03
14	5522-01	Kuau Pump 12	IRR	TCP	0.43	03/04/85
15	5641-01	Kaanapali Pump D	IRR	Ametryn	0.21	12/02/03
16	5738-01	Kaanapali P5 (before)	DW	DBCP	0.07	10/20/05
16	5738-01	Kaanapali P5 (before)	DW	TCP	0.92	10/20/05
17	5739-01	Kaanapali P4 (before)	DW	TCP	0.52	10/20/05
18	5739-02	Kaanapali P6 (before)	DW	DBCP	0.36	10/20/05
18	5739-02	Kaanapali P6 (before)	DW	TCP	0.72	10/20/05
19	5838-01	Napili A	Inactive	DBCP	0.36	6/4/93
20	5838-03	Honokohau A (Napili D)	DW	DBCP	NQ<0.04	11/30/05
20	5838-03	Honokohau A (Napili D)	DW	TCP	0.09	11/30/05
21	5838-04	Napili C	DW	TCP	0.08	08/10/05

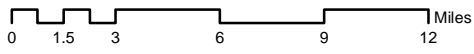
*Department of Agriculture

ISLAND OF KAUA`I 2005 GROUNDWATER CONTAMINATION



Legend

- Current Information
- Historical Monitoring Data
- Major Roads



KAUA'I 2005 Contamination Map						
Map #	Well #	Well Name	Use	Contaminant	Detected Level (ppb)	Date
1	0045-04	Barking Sands	IRR	Ametryn	0.8	07/12/88
1	0045-04	Barking Sands	IRR	Atrazine	3.50	07/12/88
1	0045-04	Barking Sands	IRR	Simazine	0.2	07/12/88
2	5631-01	Kalaheo Deep Well 1	DW	Isophorone	0.7	9/17/01*
3	5822-02	Grammar School Well	DW	Isophorone	0.6	07/08/98
4	5823-01	Garlinghouse Tunnel	DW	Atrazine	0.06	05/25/04
4	5823-01	Garlinghouse Tunnel	DW	Desethyl Atrazine	NQ<0.05	11/17/03
5	5824-06	Puhi Well 4	DW	TCE	NQ<0.5	07/26/05
5	5824-06	Puhi Well 4	DW	TCP	0.06	11/16/05
6	5921-01	Kalepa	DW	Isophorone	0.5	9/17/01*
7	5923-02	Kilohana B	DW	Isophorone	1.6	9/4/01*
8	5923-03	Kilohana C	DW	Atrazine	0.08	11/24/03
8	5923-03	Kilohana C	DW	Bromacil	0.2	11/17/03
						*Montgomery Lab

Federal and State Drinking Water Standards and Health Advisories

Contaminant	Contamination level in ppb (parts per billion)	Applicable Drinking Water Standard	Potential Health Effects from Ingestion of Water	Potential Contamination Sources
Alachlor	2	MCL	Liver, kidney or spleen problems; anemia; increased cancer risk.	Herbicide
Ametryn	60	LHA	Loss of appetite, salivation, muscle spasms or tremors, high temperature, uneven breathing, liver damage, thyroid problems.	Herbicide
Atrazine	3	MCL	Same health effects as Ametryn.	Herbicide
Benzene	5	MCL	Dizziness, pale or flushed face, uneven breathing, headache, chest tightness, weakness; anemia from damaged blood cells; increased risk of leukemia.	Solvent, gasoline
* Desethyl Atrazine * Despropyl Atrazine * Diamino Atrazine	Not available	Not available	Same health effects as Ametryn.	Herbicide
Bromacil	300	LHA	Possible human carcinogen.	Herbicide
Carbon tetrachloride (CTC)	5	MCL	Nausea, vomiting, diarrhea, dizziness, headache, fatigue, confusion, tremors; central nervous system depression; birth defects; male infertility; liver or kidney problems or increased cancer risk.	Solvent, dry cleaning agent
Chlordane	2	MCL	Fatigue, headache, muscle tremors, other nervous system problems; liver, kidney, or spleen damage; increased cancer risk.	Pesticide (termiticide)

* Breakdown product of Atrazine

1,2 Dibromo 3-chloropropane (DBCP)	0.04	SMCL	Male infertility; liver or kidney problems; increased cancer risk.	Pesticide (soil fumigant)
1,2-Dichloropropane (DCP)	5	MCL	Nausea, vomiting, diarrhea, anemia, headache, central nervous system depression; liver or kidney damage.	Pesticide, solvent
Dieldrin	0.2	10 ⁻⁴	Same health effects as Chlordane.	Pesticide
Diuron	10	LHA	Nausea, vomiting, diarrhea; birth defects.	Herbicide
Ethylene dibromide (EDB)	0.04	SMCL	Nausea, vomiting, dizziness, drowsiness; male infertility; liver or kidney damage leading to increased cancer risk.	Gas additive, soil fumigant, solvent
Hexazinone	400	LHA	Same health effects as Ametryn.	Herbicide
Isophorone	4000	10 ⁻⁴	Faintness, fatigue, central nervous system depression, nausea; liver, kidney, or spleen damage; increased cancer risk.	Solvent, herbicide, pesticide
Lindane	0.2	MCL	Same health effects as Chlordane.	Insecticide
Simazine	4	MCL	Same health effects as Ametryn.	Herbicide
Tetrachloroethylene (PCE)	5	MCL	Same health effects as carbon tetrachloride.	Solvent, dry cleaning agent
Trichloroethylene (TCE)	5	MCL	Same health effects as carbon tetrachloride.	Solvent
1,2,3-Trichloro- propane (TCP)	0.6	SMCL	Same health effects as carbon tetrachloride.	Solvent, trace contaminant in certain pesticides
1,2,4-Trichloro- benzene	70	MCL	Anemia from damaged blood cells; kidney or liver damage.	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.