

Preliminary Monitoring Stations
Kaelepulu Stream/Kailua Bay, 11/22/04



Indicators of Environmental Health

*State of Hawaii
Department of Health
Environmental Health Administration
February, 2010*

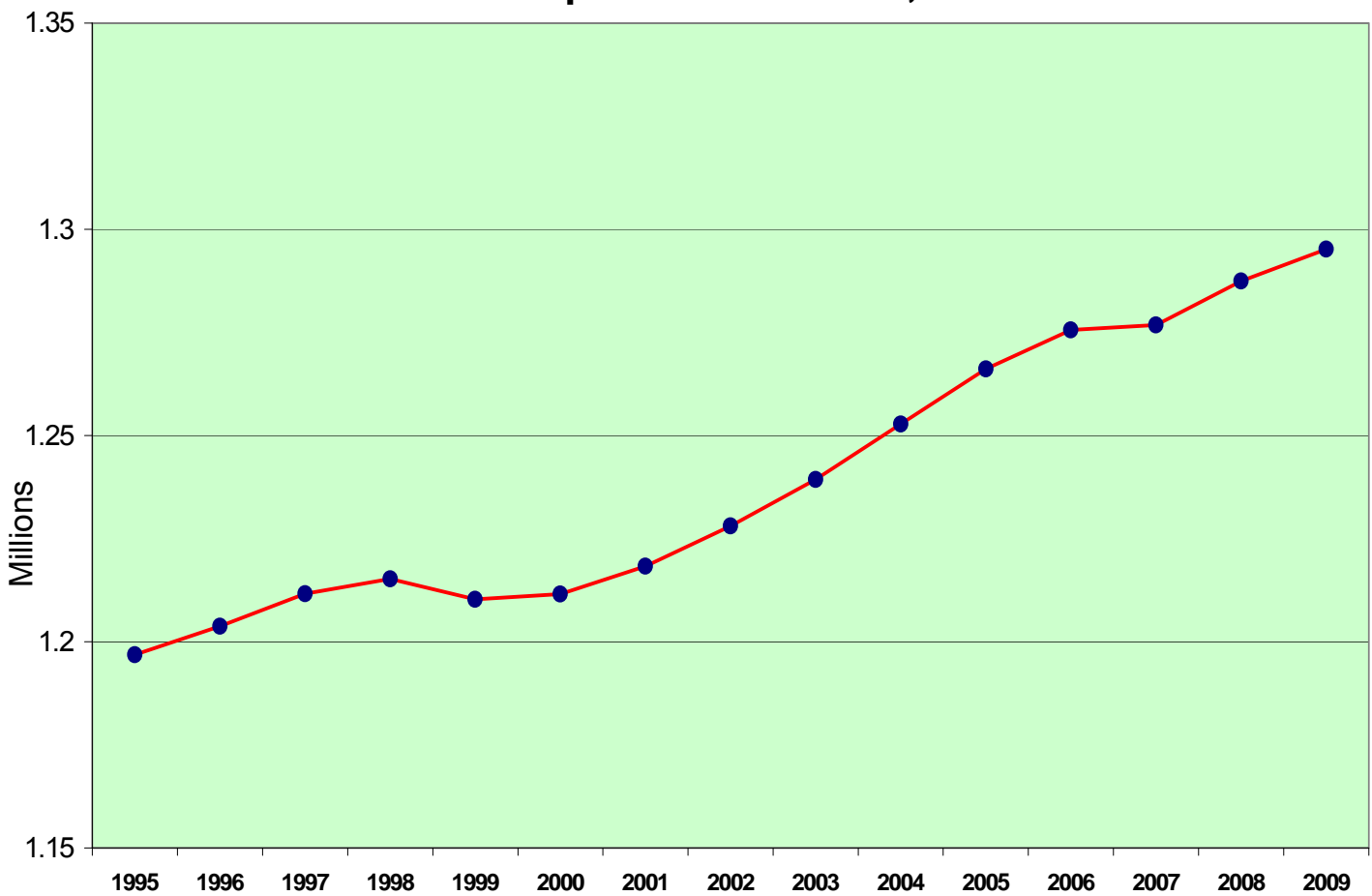
www.hawaii.gov/health/environmental

Introduction

Hawaii's population grew from about 1.1 million in 1995 to nearly 1.3 million in 2009. The population is projected to grow to 1.72 million by 2020. The rise in population not only means a greater pressure on the natural resources, but also an increase in the amount of waste products generated that are released into the air, water and land. Recently the trend has shown more growth on the neighbor islands, which means the rural areas are now also facing more of the stresses of human impact.

Because we live on isolated islands in the middle of the sea, we need to be very aware of the situations that are, or can be, created by polluting our limited land space. The effects of environmental health are closely tied to the public health of our residents and visitors. As the population continues to increase, so will the challenges to balance the needs of health, environment, and economics of Hawaii.

Resident Population of Hawaii, 1995-2009



Note: the vertical axis does not begin with zero

Source: State of Hawaii, Department of Business, Economic Development and Tourism (DBEDT), 2009 State Population Estimates.

Hawaii Department of Business Economic Development and Tourism www.hawaii.gov/dbedt

Lead by Example Initiative: www.hawaii.gov/dbedt/info/energy/efficiency/state/lbe/

Hawaii's Dependence on Fossil Fuels

Primary Energy Sources 1970-2008, Selected Years

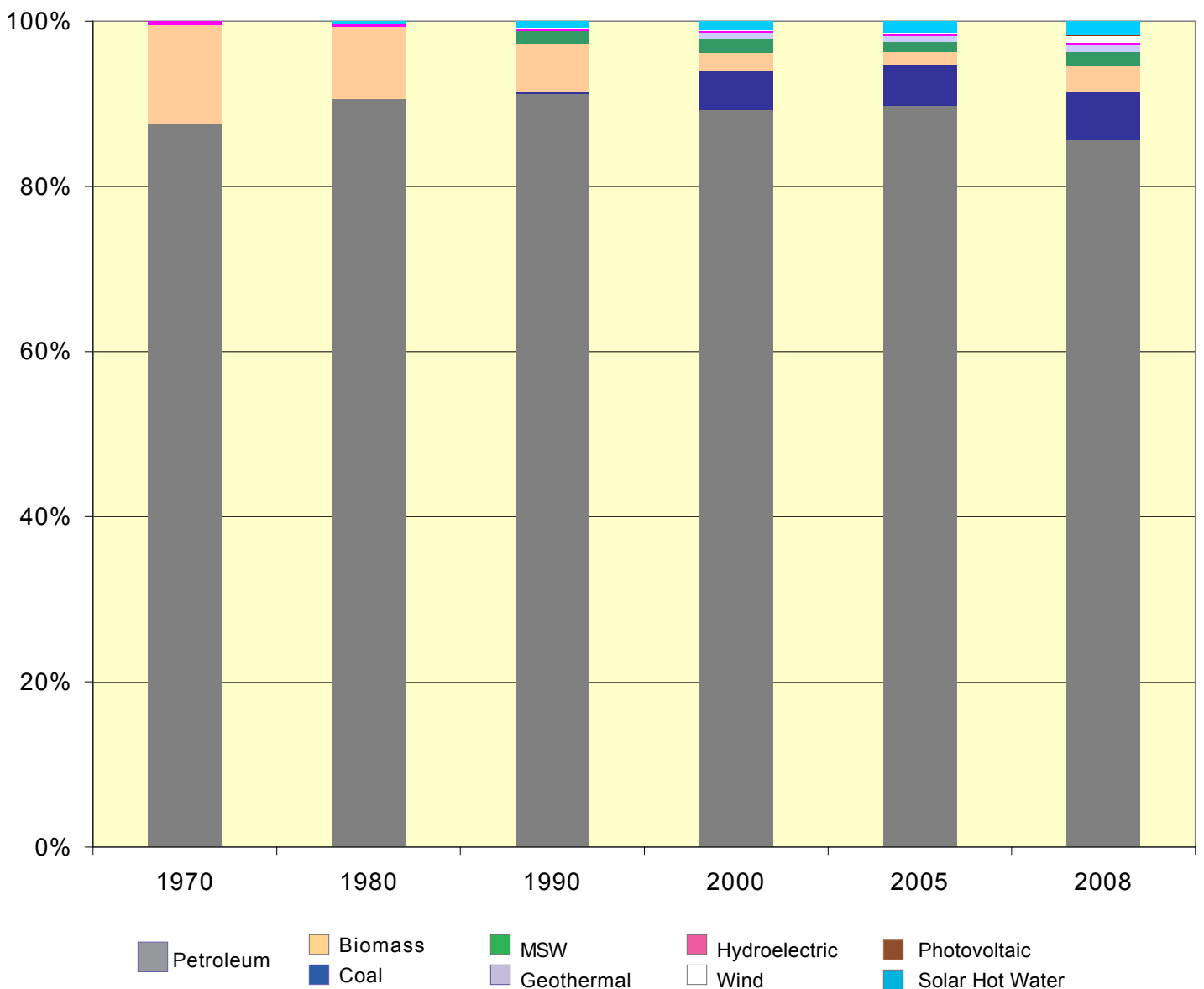
Measured in trillions of British Thermal Units (Btus)

Hawaii is the most oil-dependent of the 50 states, and relies on imported petroleum for almost 90% of its primary energy. Most of this oil is from foreign nations, with a growing percentage from the Middle East. Hawaii residents pay among the nation's highest prices for electricity and fuel.

On January 31, 2008, Governor Lingle signed a Memorandum of Understanding with the U.S. Department of Energy for the Hawaii-USDOE Clean Energy Initiative. The goal is to decrease energy demand and accelerate use of renewable, indigenous energy resources in Hawaii in residential, building, industrial, utility, and transportation end-use sectors, so that efficiency and renewable energy resources will be sufficient to meet 70% of Hawaii's energy demand by 2030. For more information:

www.hawaii.gov/dbedt/info/energy.

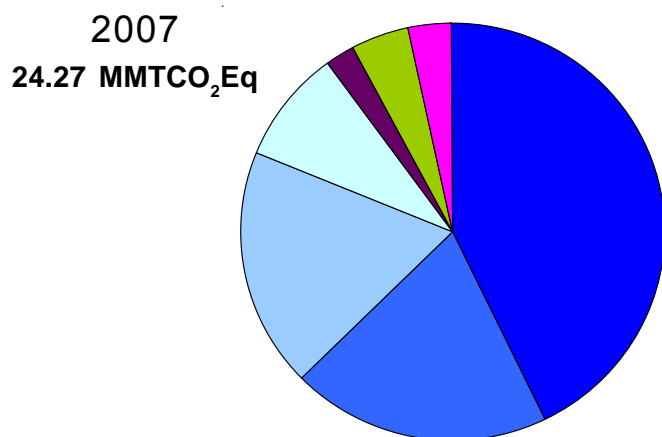
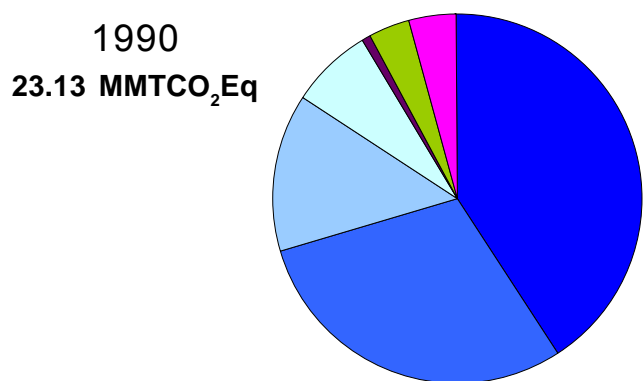
Year	Petroleum	Coal	Biomass	Municipal Solid Waste	Geothermal	Hydroelectric	Wind	Photovoltaic	Solar Hot Water
1970	197.228		26.902			1.100			
1980	248.011		24.200			0.900			0.770
1990	284.491	0.890	18.120	4.930	0.000	1.070	0.290		2.340
2000	290.235	15.472	7.133	5.109	2.586	0.948	0.179	0.004	3.548
2005	291.501	15.578	5.284	4.201	2.280	1.146	0.069	0.020	4.495
2008	258.014	17.883	8.831	5.423	2.422	0.937	2.384	0.151	5.204



Greenhouse Gas Emissions 1990 and 2007

In Million Metric Tons of Carbon Dioxide Equivalent (MMTCO₂Eq)

Climate change and global warming have the potential to severely affect Hawaii's economy, public health, natural resources, and environment. In 2007, a State law was passed (Act 234), committing the State to reduce its greenhouse gas (GHG) emissions - caused mostly by fossil fuel-based electricity generation and transportation uses - to, or below, 1990 levels by 2020. Act 234 created a Greenhouse Gas Emissions Reduction Task Force to oversee development of a work plan to achieve this goal based on GHG inventories developed in 1990 and 2007. The Clean Air Branch will be developing administrative rules to be implemented starting in 2012. For more information about Act 234, the GHG inventories, workplans, and Task Force: www.hawaii.gov/dbedt/info/energy/greenhouse.



	1990	2007
Energy*	9.44	10.37
Energy** (Aviation)	6.8	4.83
Energy (Ground Transport)	3.23	4.47
Energy (Marine Transport)	1.65	2.16
Industrial Processes	0.18	0.54
Waste	0.85	1.07
Ag, Forestry, Other Land Uses	0.98	0.83

*Includes residential, commercial, industrial, electric power, oil and gas

**Aviation emissions are excluded from Act 234, but included as part of the GHG inventory

Act 234 Global Warming Solutions Timeline

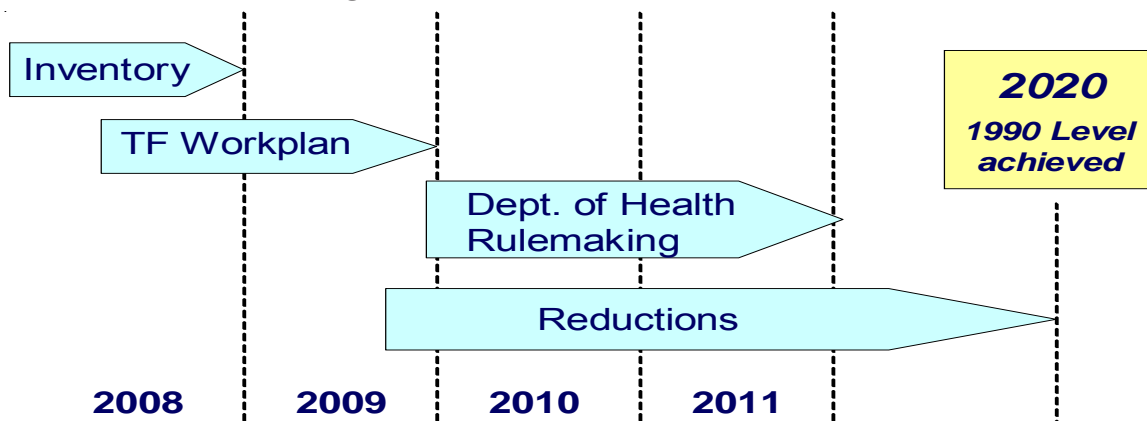


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Document Notes

Environmental Indicator: a tool that uses the best available data to measure the quality of the environment and/or progress made in protecting the environment.

This report includes a selection of twenty environmental indicators, each occupying a single page. Each indicator shows a data set, a chart based on those data, and a discussion of the indicator and the data upon which it is based.

The discussion accompanying each indicator is separated into five sections:

Explanation: the first section explains the data and chart, focusing on the fundamental picture portrayed the chart. Terms and caveats are also discussed in this section.

Implications: An “implications” section follows, with a short and sometimes subjective discussion of what impact the indicator findings may have on public health and the environment, and therefore on the Department of Health’s (DOH) environmental programs.

Data Quality: The third section provides a one-word assessment of data quality for the indicator. Data quality is ranked as either High (\pm 5-10% confidence), Medium (\pm 10-25% confidence) or Low (\pm 25-50% confidence).

The last two discussion sections note the source of the data and comment on whether the data are required of DOH by the U.S. Environmental Protection Agency (EPA). In most cases, when a percentage scale is used in a chart, the scale ranges from 0 to 100 percent. To more clearly show trends, some chart scales extend from values of 50% or 75% to 100%.

Data used are organized on a federal fiscal year (FFY) calendar, October through September, or the State fiscal year (SFY), July through June. There is usually a five-year trend for each indicator. Some indicators have data available for different time periods, and some provide only a “snap shot” of information for a single year.

CAB -Clean Air Branch
CWB -Clean Water Branch
DOH -Department of Health
EHA -Environmental Health Administration
EPA -U. S. Environmental Protection Agency
EPO -Environmental Planning Office
HEER -Hazardous Evaluation and Emergency Response Office
IRHB -Indoor and Radiological Health Branch
SDWB -Safe Drinking Water Branch
SHWB -Solid & Hazardous Waste Branch
SLD -State Laboratories Division
VCB -Vector Control Branch
WWB -Wastewater Branch

DOH contact information is listed on page 27

Ambient Levels of Sulfur Dioxide Compared to National Standards

Explanation: The national standard for sulfur dioxide (SO₂) concentrations was set by EPA at 0.03 parts per million (ppm) as the annual average limit of SO₂ in ambient air. The Honolulu air monitoring station is located atop the DOH building downtown. Data from this station are shown here as representative of SO₂ concentrations in Hawai'i. The results show that the annual average over the past five years, 0.000-0.001 ppm, has been well below the standard.

Implications:

Hawaii's annual average SO₂ concentrations are very low compared to the national standard. On persistent Kona wind days, volcanic emissions from the island of Hawaii can be transported to Oahu, and are experienced mostly as particulates. Beginning in March 2008, the opening of the new vent in the Halemaumau crater and the continuation of the Puu `O`o vent have contributed to elevated levels of SO₂ on the Big Island. While this natural exceptional event is not a representative indicator of air quality across the state, areas on the Big Island may be exposed to varying levels of SO₂ depending on the location and the local wind conditions. An SO₂ advisory website, the Hawaii Short Term SO₂ Alert Index, is available at www.hiso2index.info.

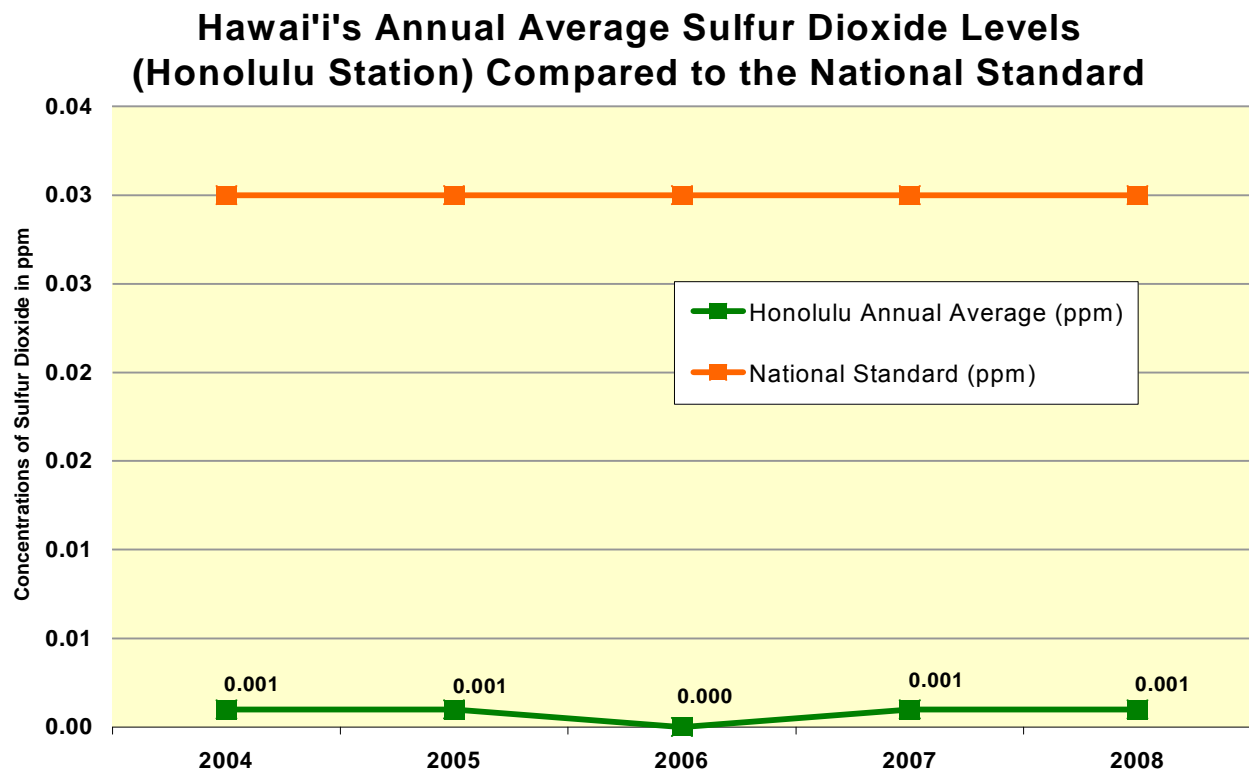
For more information: www.hawaii.gov/health/environmental/air/cab/index.html. Within this website, to see a listing of elevated air pollution levels, click on "Public Notification: Air Pollutant Exceedence on Big Island (pdf)." To view near real time monitoring data, click on: "Online Air Quality Data."

Data Quality: High (± 5-10% confidence).

Source: DOH Clean Air Branch.

Data are required by the EPA

FFY	Honolulu Annual Average of SO ₂	National Standard for SO ₂
2004	0.001	0.03
2005	0.001	0.03
2006	0.000	0.03
2007	0.001	0.03
2008	0.001	0.03



Vog Emissions from Kilauea Volcano, Big Island

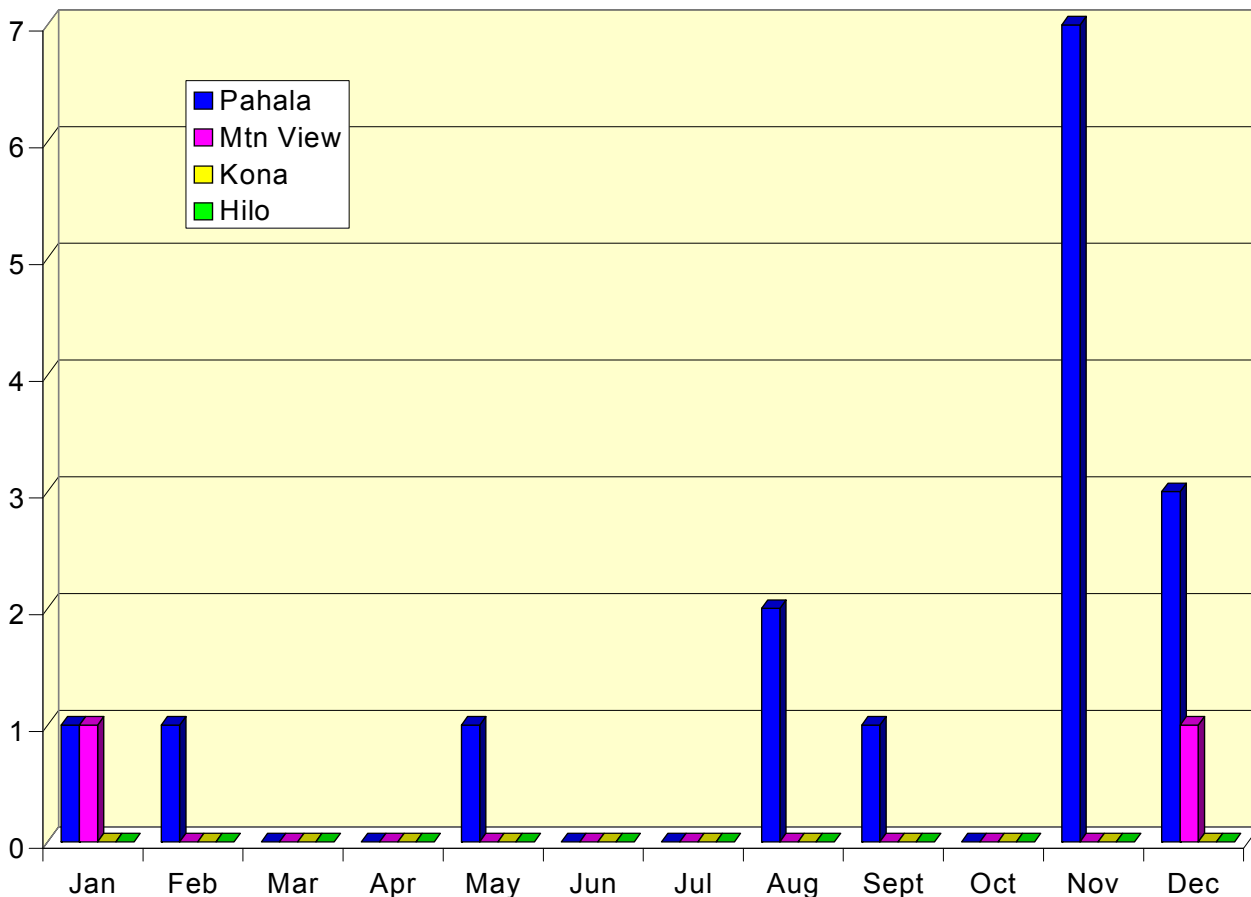
Explanation: The March 2008 opening of the Halema'uma'u Vent combined with the existing activity at the Pu'u O'o Vent, increased sulfur dioxide (SO₂) and fine particulate matter (PM_{2.5}) emissions on the Big Island, resulting in occasional exceedances of the National Ambient Air Quality Standards (NAAQS) at various places and times.

The following graph shows the number of exceedances of the SO₂ 24-hour standard for the four Big Island air monitoring stations: Pahala; Mountain View; Kona (at Konawaena High School); and Hilo (near the Hilo Medical Center). Because these exceedances are designated by EPA to be Exceptional Events caused by the volcano, they do not affect Hawaii's attainment status with the NAAQS. Hawaii exceedances of NAAQS are at: http://hawaii.gov/health/environmental/air/cab/cab_notification/exceedances_index.html

Supplement: To advise the public of short-term SO₂ values and risks, the DOH displays 15-minute average SO₂ data from five DOH and two federal Big Island monitors on a website with a color code based on health risks; see: <http://www.hiso2index.info/>. The color code was developed jointly by several agencies based on health information for short-term SO₂ exposures and not on long-term exposures as in the NAAQS. The color code is not a rule, and the 15-minute averages are not used for regulation. The amount of 15-minute data now precludes historical summaries similar to the table below

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Pahala	1	1	0	0	1	0	0	2	1	0	7	3
Mtn View	1	0	0	0	0	0	0	0	0	0	0	1
Kona	0	0	0	0	0	0	0	0	0	0	0	0
Hilo	0	0	0	0	0	0	0	0	0	0	0	0

SO₂ 24-Hour Average Exceedances on the Big Island in 2009



Ambient Levels of Air-borne Particulates Compared to National Standards

Explanation: The EPA has set the annual average of the particulate matter, or PM_{2.5}, at 15 micrograms/cubic meter (µg/m³). PM_{2.5} is defined as particulates with an aerodynamic diameter less than or equal to 2.5 microns. At the Honolulu monitoring station, located in the heart of downtown, the annual average concentration of particulates varied from 3.0 to 4.7 µg/m³. At 4.7 µg/m³ this annual average is well below EPA's standard.

Implications:

The concentrations measured in Honolulu are far below the national standard. On persistent Kona wind days, volcanic emissions from the island of Hawaii can be transported to Oahu, and are experienced mostly as particulates. Beginning in March 2008, the opening of the new vent in the Halemaumau crater and the continuation of the Puu `O`o vent have contributed to elevated levels of PM_{2.5} on the Big Island. While this natural exceptional event is not a representative indicator of air quality across the state, areas on the Big Island may be exposed to varying levels of PM_{2.5} depending on the location and the local wind conditions. A PM_{2.5} advisory website, AIRnow, is available at : www.airnow.gov/index.cfm?action=airnow.fcsummary&stateid=15.

For more information: www.hawaii.gov/health/environmental/air/cab/index.html. Within this website, to see a listing of elevated air pollution levels, click on "Public Notification: Air Pollutant Exceedence on Big Island (pdf)." To view near real time monitoring data, click on: "Online Air Quality Data."

Air-borne Particulates Data

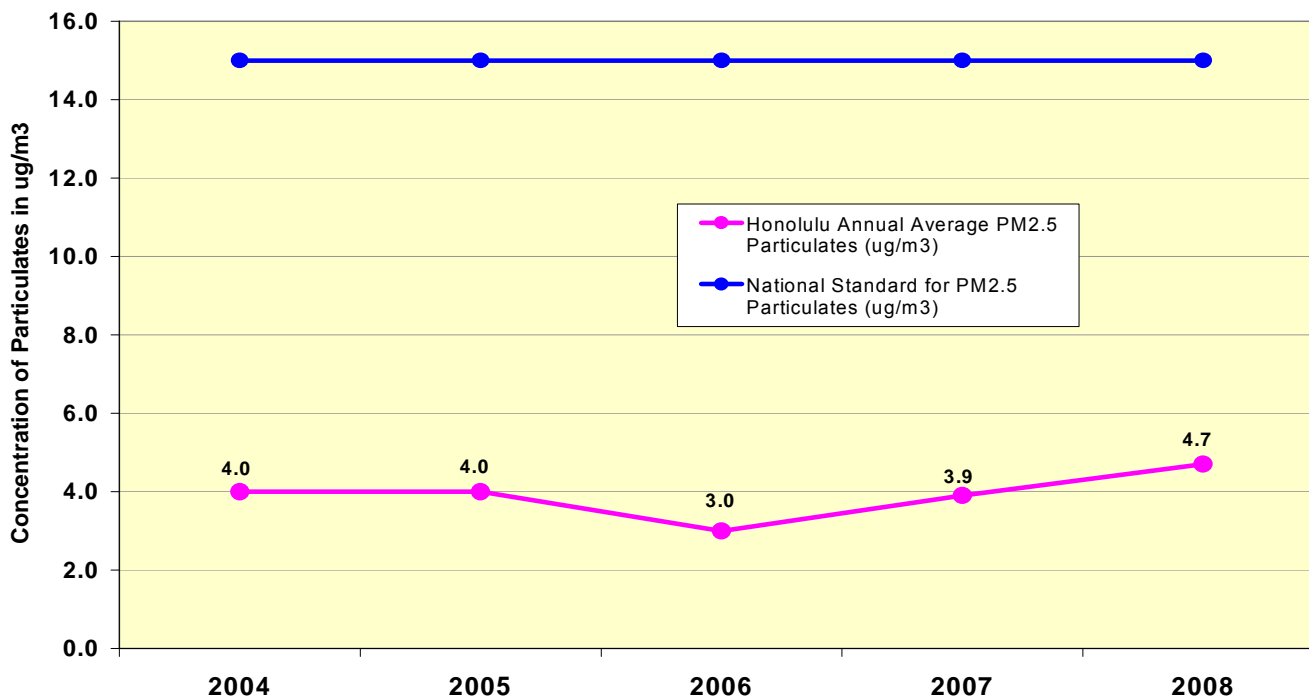
FFY	Honolulu Annual Average of PM _{2.5}	National Standard for PM _{2.5}
2004	4.0	15
2005	4.0	15
2006	3.0	15
2007	3.9	15
2008	4.7	15

Data Quality: High (± 5-10% confidence).

Source: DOH Clean Air Branch

Data are required by the EPA.

Hawai'i's Annual Average Particulate Level (Honolulu Station) Compared to the National Standard



Ambient Levels of Carbon Monoxide Compared to National Standards

Explanation: EPA set the 1-hour average limit for carbon monoxide (CO) concentrations in ambient air at 35 parts per million (ppm). This indicator reflects CO data measured at the Honolulu monitoring station located in the heart of downtown, an area with heavy automobile traffic. The CO measurement differs from the other indicators in this report as it reflects the highest 1-hour value each year rather than an annual average. In addition to the 1-hour national standard, EPA has set an 8-hour standard for CO at 9 ppm.

Implications: Although there are some fluctuations in the annual averages, Hawai'i's recorded 8-hour values are consistently well below the national standard.

For real/near time monitoring data for Oahu and Hawaii: www.hawaii.gov/doh/air-quality/index.html

Data Quality: High (± 5-10% confidence).

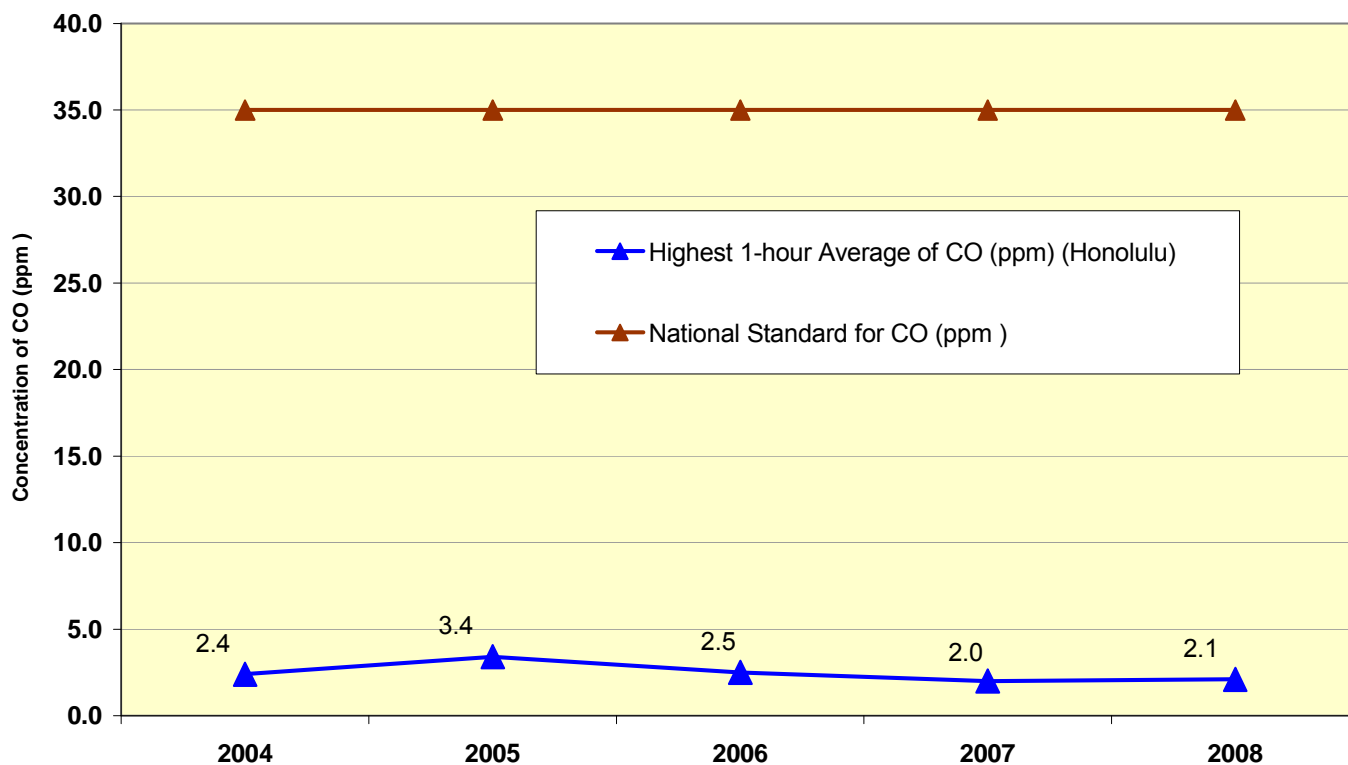
Source: DOH Clean Air Branch

Data are required by the EPA.

Carbon Monoxide Data

FFY	Highest 1-hour Average of CO (Honolulu)	National Standard for CO (ppm)
2004	2.4	35
2005	3.4	35
2006	2.5	35
2007	2.0	35
2008	2.1	35

Hawai'i's Highest 1-hour Average for Carbon Monoxide (Honolulu Station) Compared to the National Standard



Schools with Required Asbestos Management Plan and in Compliance

Explanation: Buildings constructed before 1980 may contain asbestos in many materials including flooring, pipe insulation, structural fireproofing, mechanical areas, ceiling materials, and wall plaster. If asbestos-containing materials (ACBMs) are not properly identified and managed, they may be unintentionally disturbed, releasing asbestos fibers. ACBMs still exist in Hawaii's schools.

EPA and DOH rules require schools to prepare and implement Asbestos Management Plans, to document the condition of ACBMs and specify their proper management. Plans must cover inspections, surveillance, response information, notices to parents and employees, key people designations, and custodian training. Openings and closings affect the number of schools.

Since 1988, the Indoor and Radiological Health Branch has inspected over 400 schools and inspects approximately 35 schools per year. IRHB increased assistance (conferences, newsletters, and reminders) and inspections starting in 2005.

Implications: Almost all schools have a required plan. Through 2008, DOH assumed that approved plans were implemented unless an inspection showed otherwise.

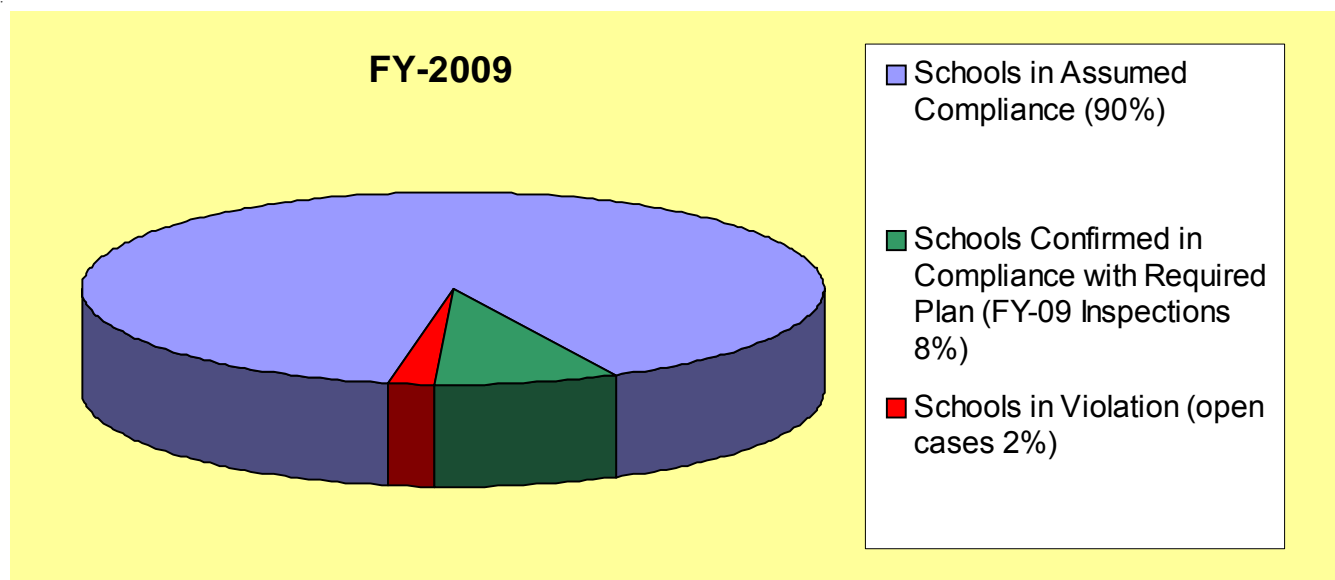
FFY	Number of Schools Required to Comply	Number of Schools in Assumed Compliance	Number of Schools with Confirmed Compliance	Percentage of Schools in Compliance with Required Plan
2005	423	414	30	98%
2006	423	414	28	98%
2007	437	431	36	99%
2008	440	432	36	98%
2009	440	433	35	98%

Data Quality: High (±1-5% confidence).

Source: Tom Lileikis (IRHB)

Data are required by the EPA

Percentage of Schools with Required Asbestos Management Plan & In Compliance



Contaminated Sites with Clean-up Completed - Tanks, Hazardous, and Solid Waste

Explanation: Progress made in the clean-up of contaminated sites, broken down into three categories, is measured by the date of completion of the clean-up process. The vast bulk of the clean-ups are comprised of leaking underground storage tank (LUST) sites. The next three indicators on the following pages will provide more specific data relating to the progress of each site category.

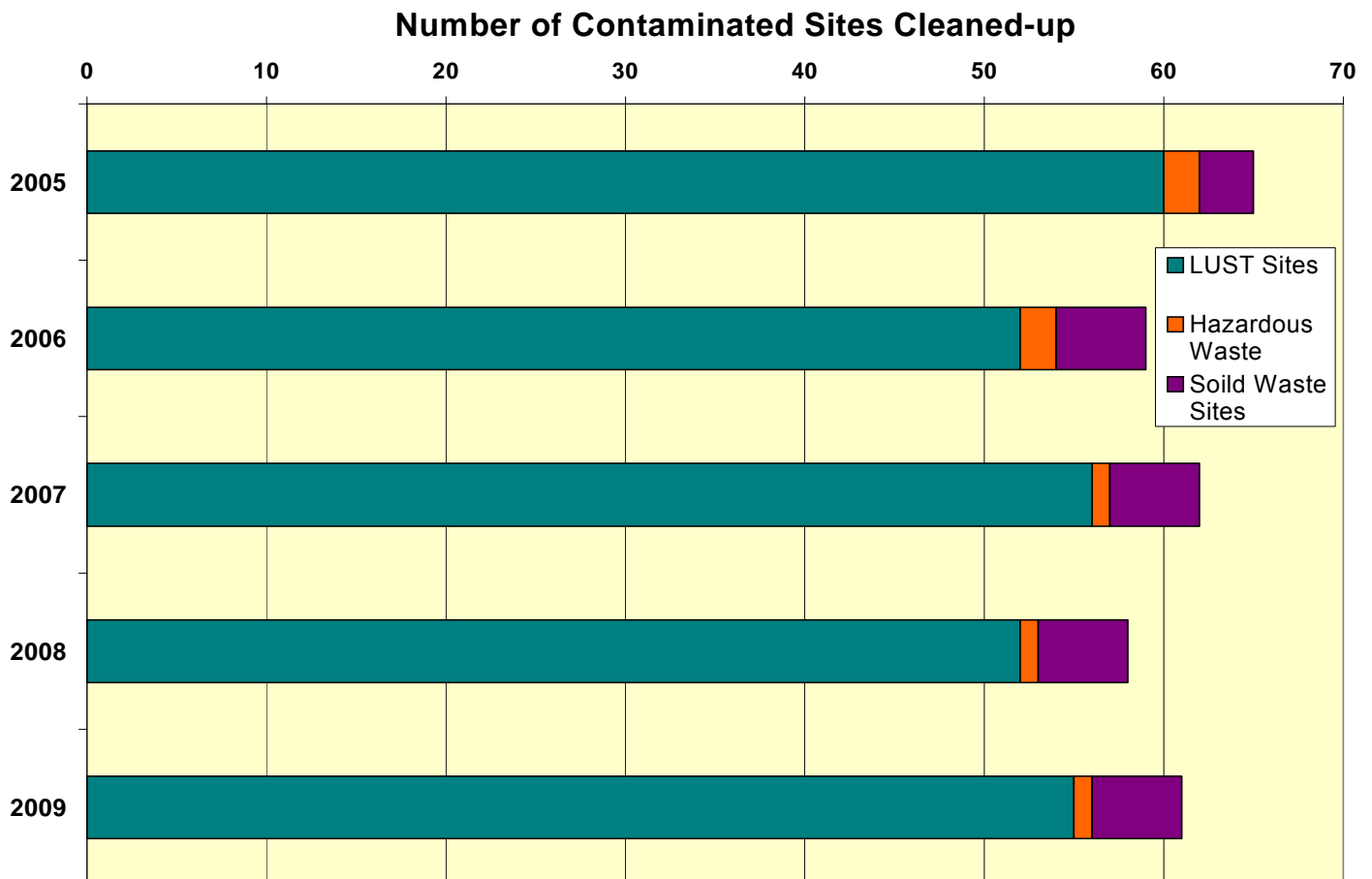
Implications: Staff has brought a backlog of LUST release cases into compliance with Hawai'i's UST rules.

Data Quality: High (± 5-10% confidence).

Sources: Grace Simmons (SHWB), Lane Otsu (SHWB), and Roxanne Kwan (SHWB).

Data are required by the EPA.

FFY	Hazardous Waste	Soild Waste Sites	LUST Sites	Total Sites
2005	2	3	60	65
2006	2	5	52	59
2007	1	5	56	62
2008	1	5	52	58
2009	1	5	55	61



Cumulative Leaking Underground Storage Tank Sites with Full or Partial Clean-up

Explanation: Of the 1,989 confirmed releases from underground storage tanks from 1987 to 2009, 88% have had 'clean-up' completed. Eight percent of the sites have had 'clean up' partially addressed, (i.e., efforts have begun which: manage contaminated soil, remove free product, manage dissolved petroleum, and/or monitor the groundwater or soil), and 4% have yet to be addressed.

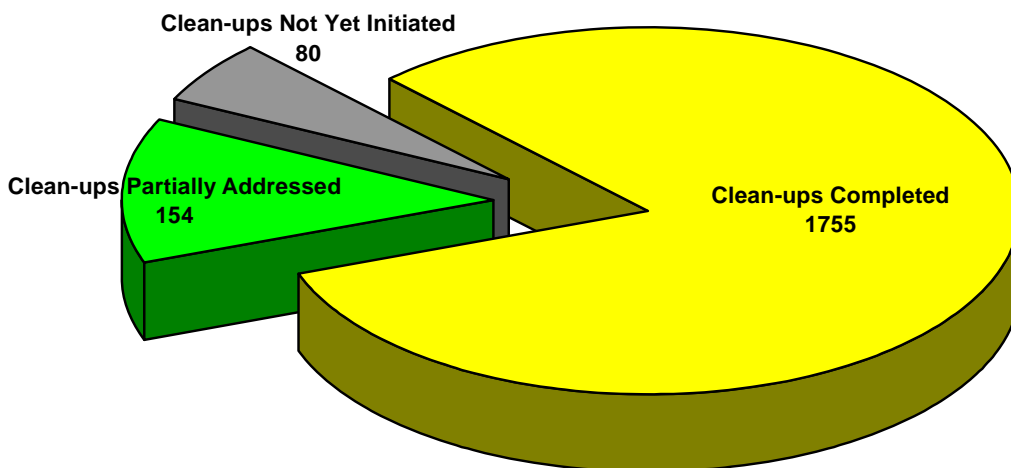
Implications: Some of the data for this indicator are included with data listed on the previous page; the data on this page pertains only to LUST sites and includes releases that have received no clean-up activity or that have only had clean-up partially addressed. Clean-ups for this category of contaminated sites has increased. Of the 4% of the sites that have not been addressed, some are recent releases for which the DOH has yet to receive information on clean-up efforts. None of the unaddressed sites constitutes an emergency situation.

Data quality: High (± 5-10% confidence).

Source: Roxanne Kwan (SHWB).
Data are required by the EPA.

LUST Site Clean-up Data							
FFY	Total Tanks	Active Tanks	Closed Tanks	Confirmed Releases	Clean-ups Partially Addressed	Clean-ups Not Initiated	Cumulative Clean-ups Completed
2005	7,803	2,041	5,762	1,840	236	100	1,504
2006	7,832	2,001	5,831	1,874	206	94	1,574
2007	7,916	1,895	6,021	1,909	192	86	1,631
2008	7,845	1,770	6,075	1,955	184	76	1,695
2009	7,873	1,701	6,172	1,989	154	80	1,755

Status of Leaking Underground Storage Tank Sites Cleaned Up as of FY 2009



Quantity of Hazardous Waste Generated

Explanation: Hazardous waste generation, as presented in this indicator, is reported to EPA by “large quantity generators” biennially in odd years. There are 28 facilities covered by this report. Data from the last reporting cycle for 2007 is available on the EPA website (www.epa.gov). Overall, the quantity of waste generated, as shown in this indicator, has ranged from roughly 780 to 1500 tons annually during the period from 1999 to 2007. Hazardous wastes in wastewater have been excluded from the indicator because the data quality for wastewater volumes is particularly questionable, especially since volume was removed as an EPA reporting requirement in 1997*. The majority of hazardous wastes in Hawai‘i are sent to permitted commercial treatment storage disposal facilities on the mainland, while the recyclable solvents are processed in state. Hazardous waste is defined in 40 CFR 261.3 as waste having any of the four hazardous characteristics: ignitability, corrosivity, reactivity, or toxicity, or a waste specially listed as a substance to be regulated as a hazardous waste. Common examples include paint, battery acid, oil, lead, and waste bleaches. The 2009 numbers will be published in the report next year.

Implications: Compared to other states, hazardous waste generation has been relatively low in Hawai‘i. During the eight-year period represented by this indicator, hazardous waste generation appears to be fairly consistent except for a decrease in 2001. The significant decrease in waste generation for 2001 is linked to the efforts of the waste minimization coordinator and a stronger inspection and enforcement presence. The increases in 2003 -2007 may be due to a one-time generation for clean-up of contaminated sites.

* However, the amount on the EPA website for 2001 does include 464,076 tons of wastewater generated by Tesoro Refinery. In previous reports, Tesoro’s wastewater generation was not included.

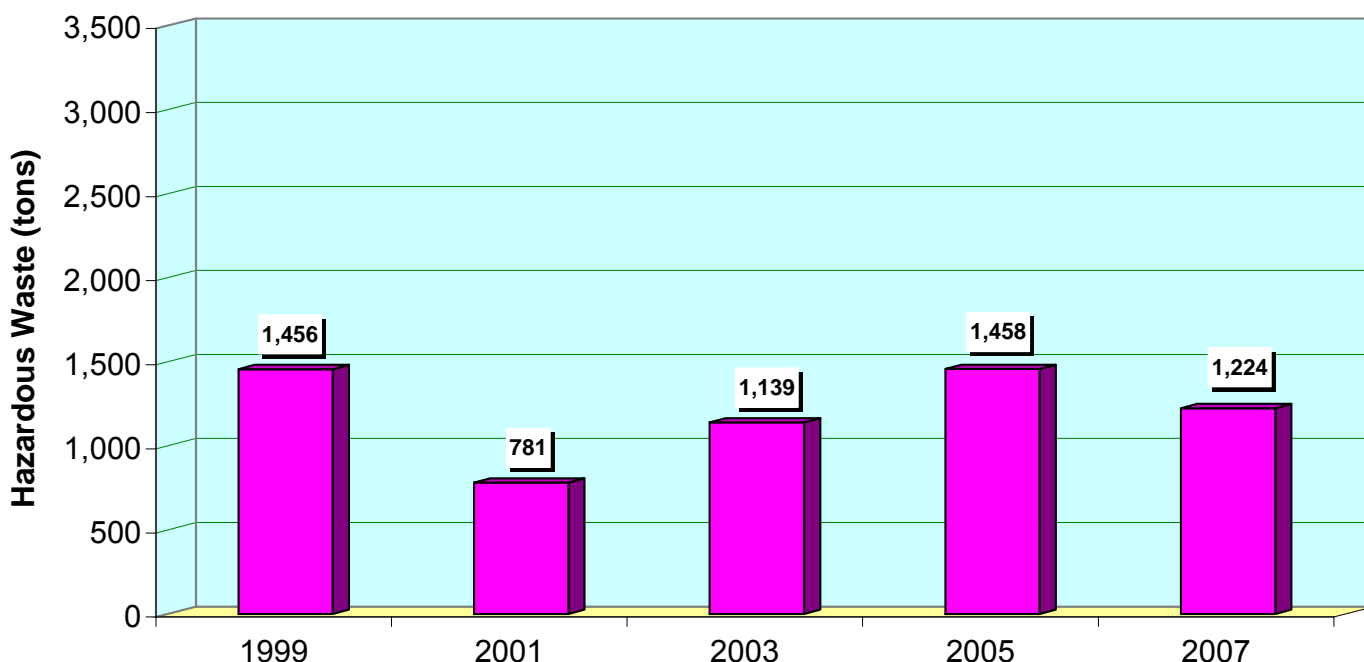
Data Quality: Low (± 25-50%) confidence.

Source: Grace Simmons (SHWB).

Data are required by the EPA.

FFY	Hazardous Waste Generated in Tons
1999	1,456
2001	781
2003	1,139
2005	1,458
2007	1,224

Quantity of Hazardous Waste Generated in Hawaii



Solid Waste Recycled

Explanation: The amount of waste being landfilled has been increasing over the past seven to eight years. The percentage of solid waste diverted from landfills for recycling or reuse in Hawaii has also slowly increased over the past several years. Waste to energy is not included here.

Implications: The State's current diversion rate is 35.7%, and is based mostly on the amount of recycling plus some reuse. The Environmental Protection Agency (EPA) data indicates a national recycling rate of 33.4% in 2007. The State's goal of 50% waste diversion was set in 1991 and mirrored the EPA's recycling goal at the time. The EPA has since revised its recycling goal to 35%. This change was made in recognition of the fact that states and municipalities needed a broader time frame in which to reach higher waste reduction levels.

Some mainland states and municipalities have taken great strides in increasing recycling rates, while Hawaii's commercial recyclers continue to deal with long-standing issues. Most notable is the high cost of shipping to the Far East or the mainland U.S. where most recycling markets are located. Volatility in recycled materials markets, combined with the relatively small amounts of materials generated in Hawaii, also continues to challenge recyclers.

Total Solid Waste Recycling Data (in tons)

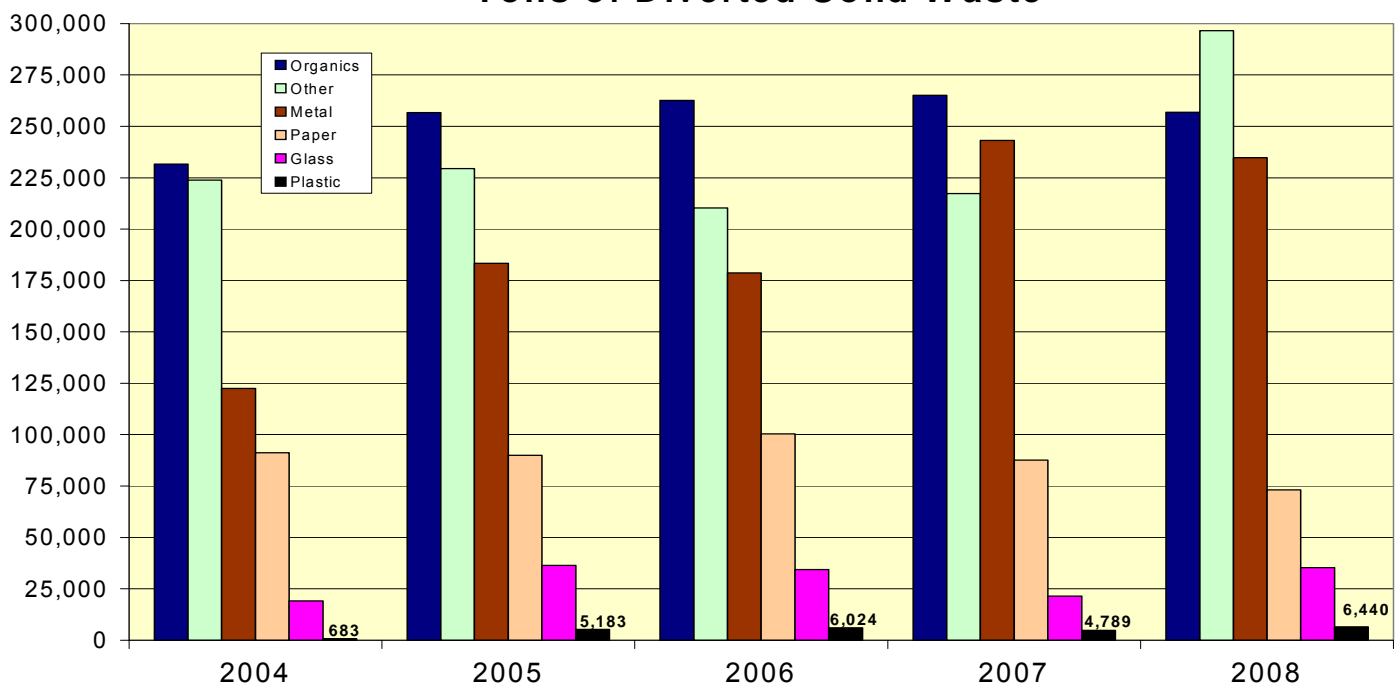
Data Quality: 2004-2008: Medium (± 10-20%) confidence

Source: Lane Otsu (SHWB)

Data are not required by the EPA.

State FY	Produced Statewide	Disposed Statewide	Diverted Statewide	Percentage Diverted
2004	2,116,724	1,427,904	688,820	32.5%
2005	2,227,124	1,425,752	801,373	36.0%
2006	2,526,134	1,733,889	792,245	31.4%
2007	2,617,350	1,778,009	839,341	32.1%
2008	2,532,370	1,629,397	902,973	35.7%

Tons of Diverted Solid Waste



Pounds of Solid Waste Generated Per Person

Explanation: This indicator is meant to give a “snapshot” of solid waste generation in Hawaii and the mainland, but should not be viewed as a comparison, since the materials included and methods of calculation vary between the State and the EPA.

EPA uses data gathered from industry associations, business and industry sources and federal government data from the Commerce Department and Census Bureau to estimate their statistic. The State’s statistics are generated using a combination of State and County data from tip fee surcharge reports and county recycling programs.

The EPA national statistic only includes materials typically defined as municipal solid waste. It excludes municipal sludges, non-hazardous industrial wastes, residue from auto salvage operations, agricultural wastes and construction/demolition (C&D) wastes. In Hawaii, each county has different circumstances in which EPA-excluded materials might be counted into the waste stream without a way to separate the segments. For example, there are no separate construction/demolition landfills on Kauai or the Big Island. In those counties, C&D materials are deposited into the regular landfills.

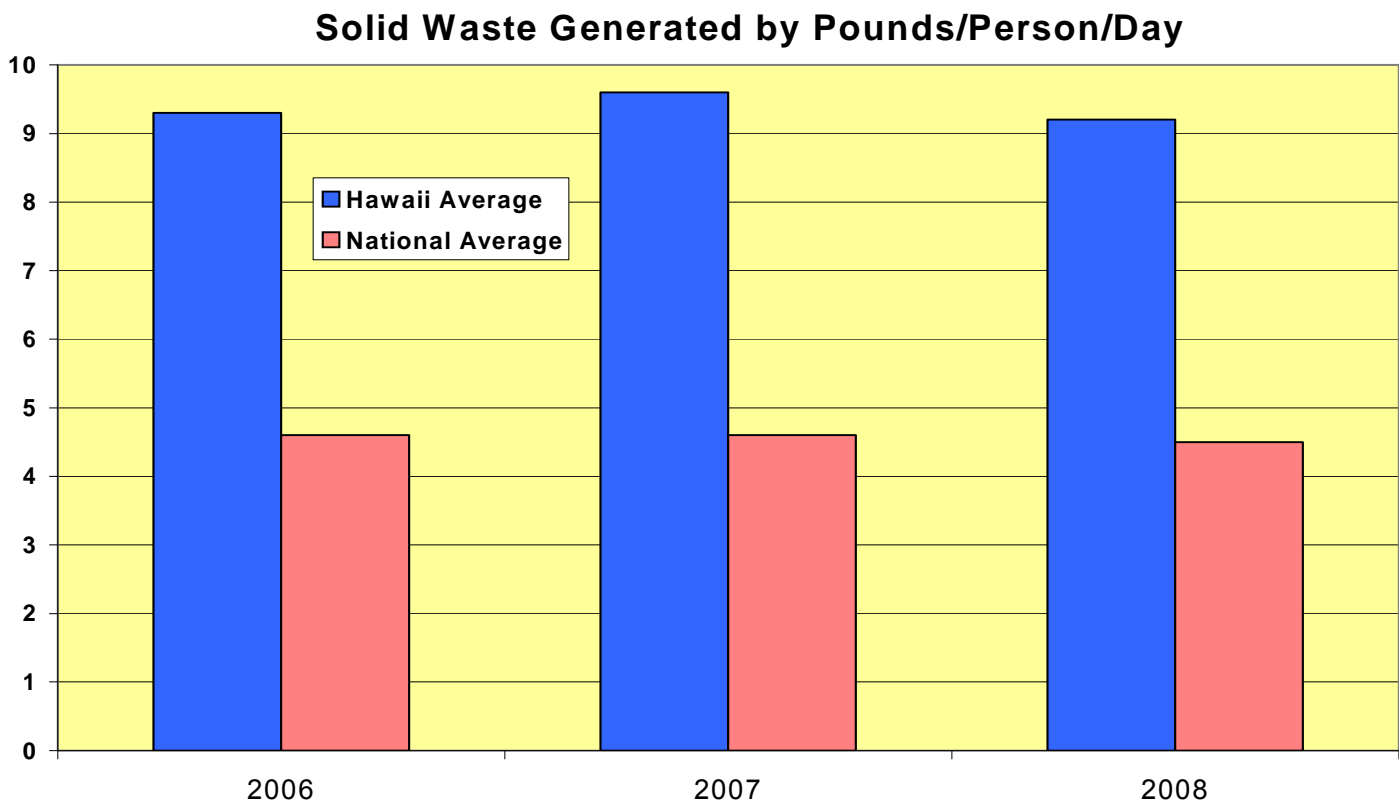
Implications: Because of the differences in defining and collecting data, Hawaii’s number is not directly comparable to EPA’s. However, it may be of interest to note the year-to-year changes as independent trends nationally and statewide.

Data Quality: Low (\pm 25-50%) confidence

Source: Lane Otsu (SHWB)

Data are not required by the EPA.

FFY	Hawaii	National
2006	9.3	4.6
2007	9.6	4.6
2008	9.2	4.5



Zoonotic Diseases Detected

Explanation: Hawaii was able to pass another year without the arrival of West Nile Virus, though the Vector Control Branch and State Laboratories continued their work to test mosquitoes and birds for any signs of the disease. In early 2009, Hilo Vector Control conducted rat trapping at residential premises of patients with rat-lungworm disease in the Puna district of the Big Island. *Angiostrongylus cantonensis*, the causative agent, was detected by macroscopic examination of lungs and pulmonary arteries in 37 of 62 (59.7%) rats retrieved from several residences. Rodents were also trapped and tested for signs of leptospirosis, murine typhus, and plague.

Implications: The Vector Control Branch and State Laboratories had significant budget cutbacks and staff layoffs, and funding, by the Hawaii Invasive Species Council, for West Nile Virus surveillance and control has ended. Surveillance and testing will be reduced for the zoonotic diseases that may threaten public health.

Disease Tested (# Positive)	TOTAL	Oahu	Hawaii	Maui	Kauai
West Nile (mosquito pools*)	4692 (0)	3818 (0)	571 (0)	103 (0)	200 (0)
West Nile (birds)	181(0)	79 (0)	35 (0)	56 (0)	11 (0)
Leptospirosis	346 (1)	53 (1)	293 (0)	0 (0)	0 (0)
Murine Typhus	120 (0)	2 (0)	114 (0)	4 (0)	0 (0)
Plague	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Rat Lungworm	62 (37)	0 (0)	62 (37)	0 (0)	0 (0)

* A group of 15-50 insects pooled together for testing purposes. The total number of mosquitoes tested for WNV was 203,977.

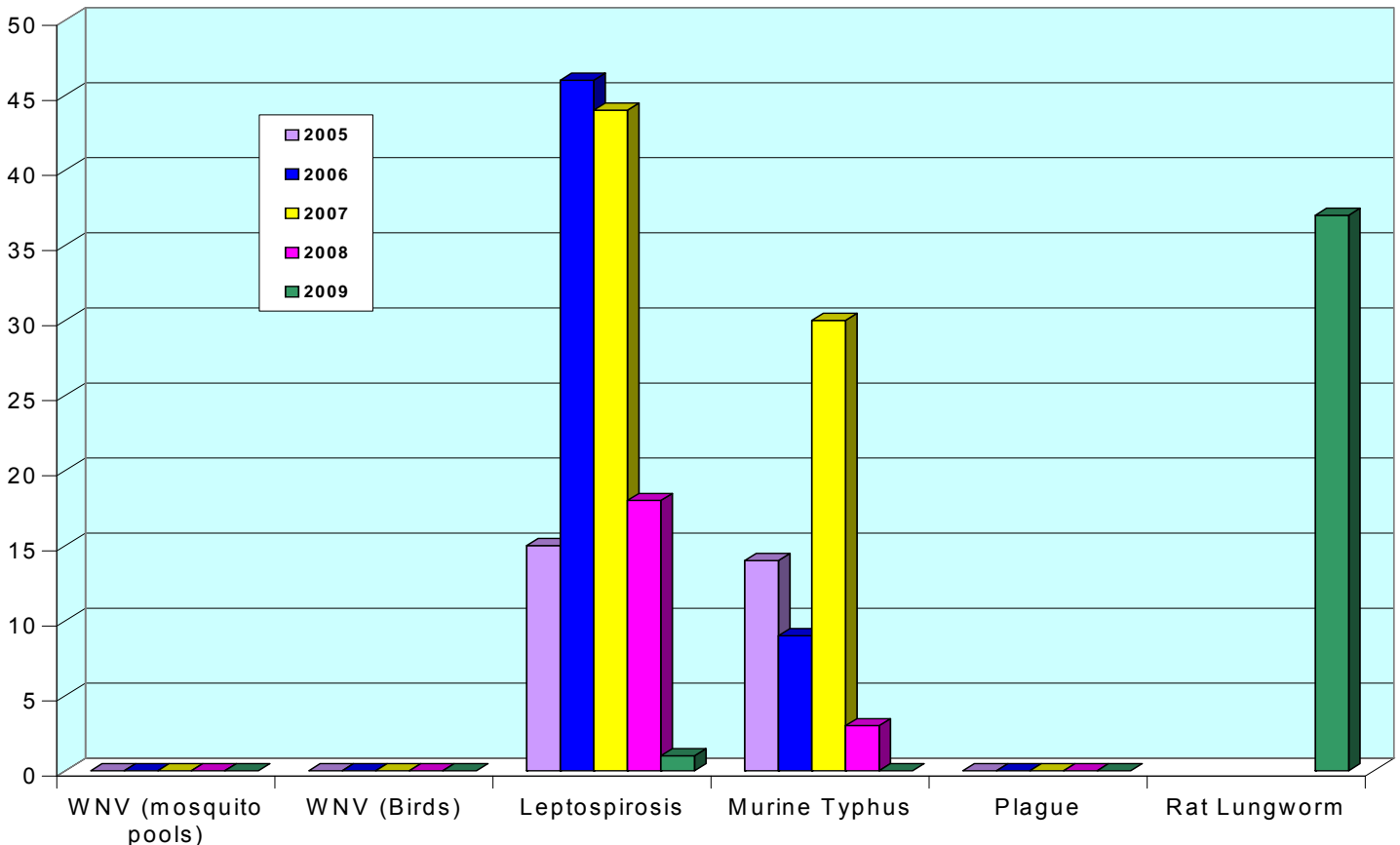
** Rat and mouse sera tested by the indirect fluorescent antibody (IFA) technique

*** Only animals retrieved from ports of entry tested for plague

Source: Wes Warashina (VCB Laboratory)

Data are not required by the EPA.

Number of Positive Findings of Zoonotic Diseases 2005-2009



Percentage of Population Served Drinking Water Meeting Allowed Maximum Contaminant Levels

Explanation: Drinking Water microbiological or chemical standards are called Maximum Contaminant Levels (MCLs). Water that exceeds MCLs is believed to be harmful to human health. In State fiscal year 2009*, 99.4% of Hawaii's residents and visitors were served drinking water that met all of the MCLs on a monthly basis. Population figures are derived by summing the populations each public water system reports. A portion of the population is served by small, unregulated systems such as individual home catchments. These systems are excluded and are estimated to serve about 40,000 persons.

There was an average of 8,599 person-months of exposure to water not in compliance with MCLs during the reporting year. This equates to a non-compliance rate of 0.6% over Hawaii's population of 1,440,715 people.

Implications: The number of people served water not in compliance is calculated as a monthly average this year instead of as an annual average as done in 2004-2007. Violations are given to a whole system (and thus the whole system population is counted) even though in actuality only a part of the system may have been exposed to water with a positive bacterial count. Also, for the purposes of this count, each system population was considered exposed to the microbiologically contaminated water for the whole month, although the population was actually exposed for only part of the month, (in some cases less than a day). Even with these conservative assumptions, the compliance rate has consistently exceeded 99.0% over the last 6 years. Whenever a violation is found, the public is notified through electronic media, hand-delivered notices, or published notices.

Data Quality:
High (± 5-10% confidence).

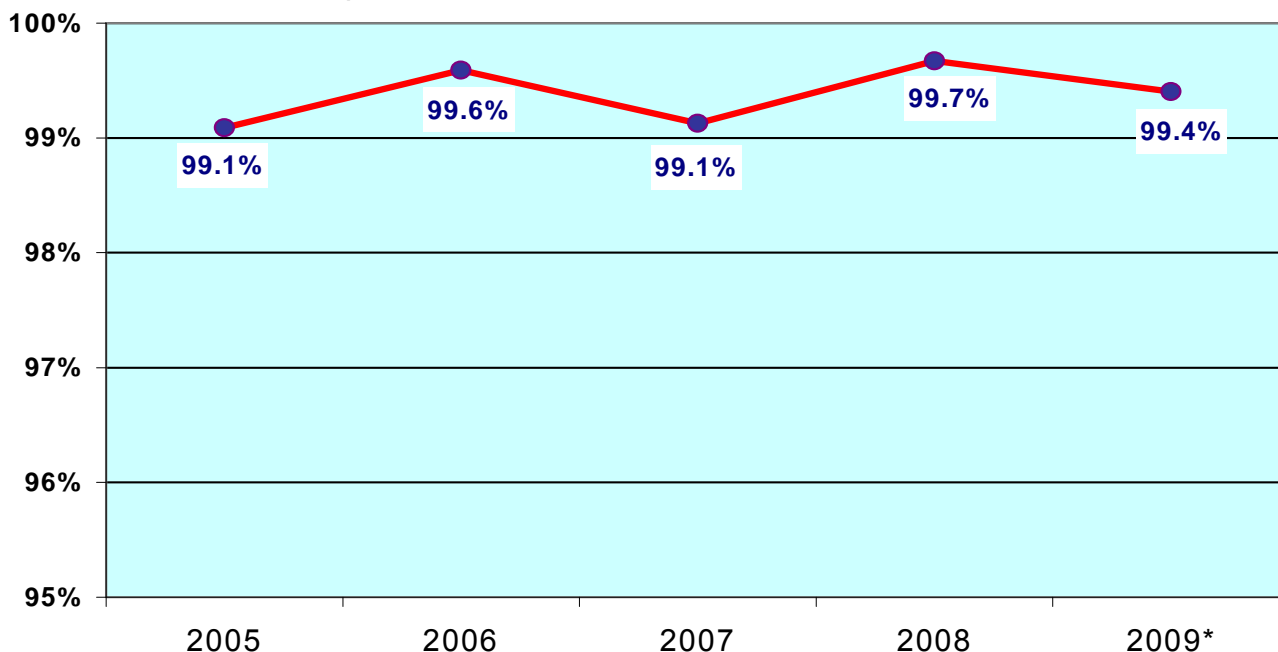
Source: Ann Zane (SDWB)

Data are required by the EPA

Calendar Year	Total Population Served Drinking Water	Population Served Water Below MCLs	Percentage Population Served Water in Compliance with MCLs
2005	1,341,727	1,329,510	99.1%
2006	1,341,430	1,335,929	99.6%
2007	1,341,430	1,329,748	99.1%
2008	1,416,384	1,411,729	99.7%
2009*	1,440,715	1,432,116	99.4%

* In 2009, the timeline was changed from the calendar year to the State fiscal year of July 1, 2008 - June 30, 2009.

Percentage of Hawai'i's Population Served Drinking Water in Compliance with Maximum Contaminant Levels



Cumulative Sanitary Surveys of Drinking Water Systems

Explanation: A sanitary survey consists of a periodic review of the water source, facilities, equipment, operation and maintenance practices and records to verify that a public water system is operating properly. The DOH goal is to conduct “Sanitary Surveys” of all public water system source, treatment, and distribution operations in a five-year period. For Hawai‘i, that averages 26 surveys per year. The SDWB completed the last five-year cycle in 2006, and the next cycle will go from 2007-2011. Because of personnel shortages, implementing new rules and regulations, and dealing with issues regarding national security of drinking water systems, meeting these survey goals will continue to be a challenge.

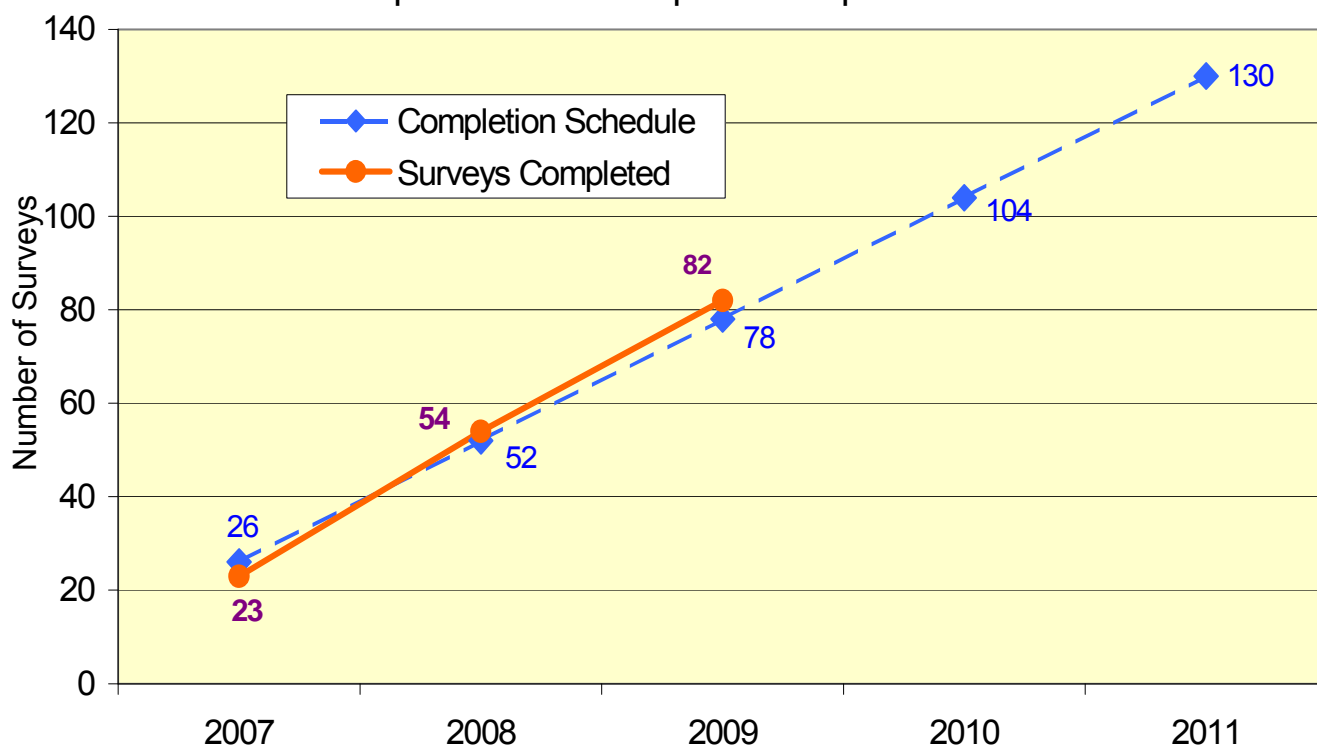
Implications: The first round of surveys was held from 1997 to 2001, so DOH is embarking on the third round of inspecting these water systems again. Within 30 days of each survey, the SDWB submits a sanitary survey report to the purveyor discussing any deficiencies and recommendations. The SDWB also requests a response from the purveyor within 30 days of receiving the report. When problems are found during surveys, the risk of water contamination is assessed. If the problem poses an imminent risk of contamination to the source or finished water, the SDWB will direct the purveyor to promptly correct the problem.

Data Quality:
High (± 5-10% confidence).

Source: SDWB
Data are required by EPA

FFY	Target Cumulative Number of Systems to Survey	Surveys Actually Completed Annually (& Cumulative)
2007	26	23 (23)
2008	52	31 (54)
2009	78	28 (82)
2010	104	
2011	130	

Drinking Water Sanitary Surveys Completed Compared to EPA-Required Completion Schedule



Percentage of Injection Well Facilities with Current State Underground Injection Control (UIC) Permits

Explanation: The percentage of underground injection well facilities in compliance with state regulations (those with a current permit) for 2009 has increased slightly to approximately 54% since 2008. A change for this year's report includes using the State fiscal year (July 1, 2008-June 30, 2009) instead of the calendar year. Most noncompliant injection well facilities were those for drainage injection wells – wells used for rainfall runoff disposal. The compliance percentage for drainage injection well facilities has slightly increased to approximately 50%. Injection well facilities for sewage disposal and industrial-related wastewater disposal also had a slight increase to approximately 63%. New injection well construction and permit renewals for sewage and industrial-related injection have processing priority over permit renewals for drainage injection. Heavy workloads of large-capacity cesspool injection well permitting and abandonment applications negatively affected the overall compliance percentages.

Implications: Drainage injection wells typically pose a lower potential for environmental contamination as compared to industrial or sewage related facilities. However, for counting purposes, all facilities are weighed equally. Injection well abandonment applications were given high processing priority due to the importance of achieving proper backfilling work and accommodating construction schedules.

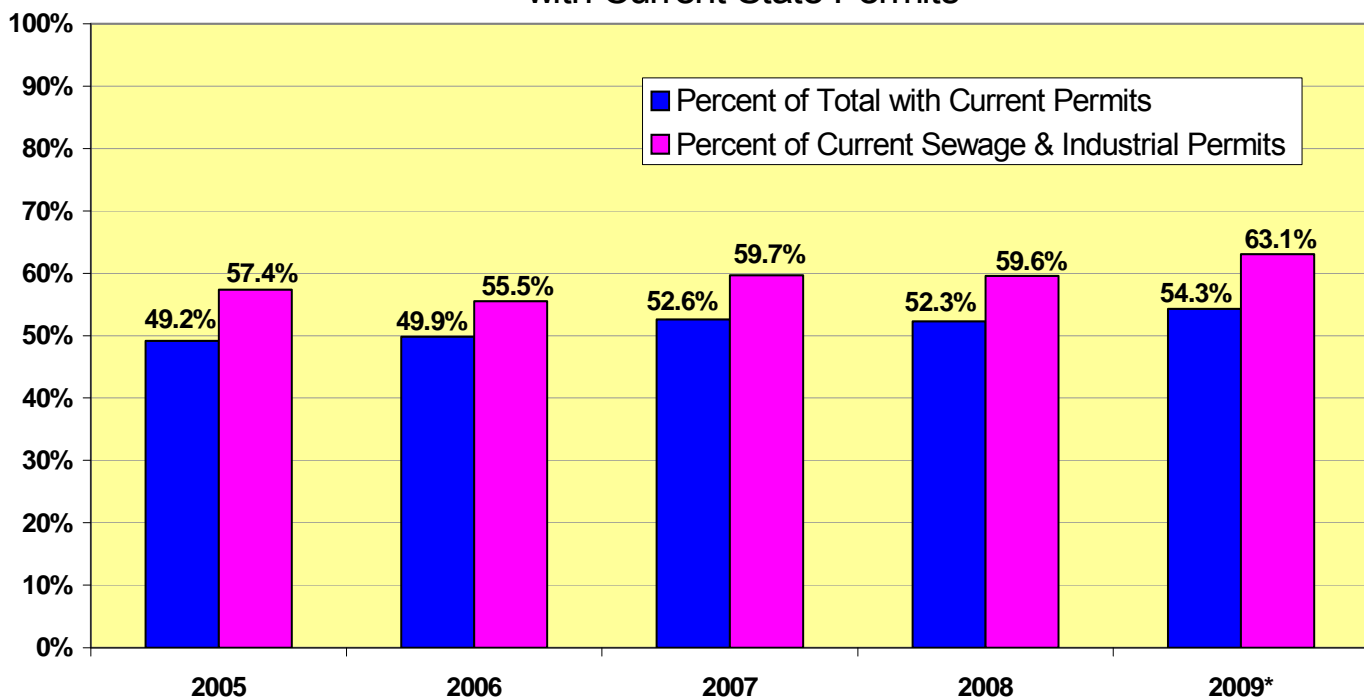
Data Quality: Medium
Data are required by the EPA.

Source: Chauncey Hew (SDWB)

Calendar Year	Total UIC Permits	Total Expired Permits	Percent of Total with Current Permits	Percent of Current Sewage & Industrial Permits
2005	679	345	49.2%	57.4%
2006	714	358	49.9%	55.5%
2007	768	364	52.6%	59.7%
2008	796	379	52.3%	59.6%
2009*	818	374	54.3%	63.1%

*2009 data is for the State fiscal year from July 1, 2008 to June 30, 2009

Percentage of Underground Injection Well Facilities with Current State Permits



Shoreline Postings Due to Sewage or Other Water Pollution

Explanation: Residents and visitors use our public beaches and the ocean for recreation and fishing. Sewage, chemical spills, and other releases can restrict our enjoyment and use of the shoreline as well as affect aquatic life. The following table shows the number of times shoreline waters were posted with warning signs (unsafe due to water pollution) by the counties, military, private parties or DOH. The reports starting from 2005 reflect a major change in that all shoreline recreational waters were considered. Although harbors are not considered recreational waters, they were included to be consistent with the 2005 annual report. Reports prior to 2005 only covered sandy beaches. Since 2005, the report also distinguishes days posted by different events: dry or wet weather sewage spills. A change for this year's report includes using the State fiscal year (July 1, 2008-June 30, 2009) instead of the calendar year.

Implications: There were 310 days of shoreline postings in State FY 2009. There were 20 spill incidents during State FY 2009 that needed postings. At Mokauea island, untreated wastewater was being directly discharged into State waters. For any sewage spills, shorelines are first posted, then sampling occurs. The CWB reviews bacteria data prior to allowing removal of the signs.

Source: Clean Water Branch

Data Quality:
Medium
(± 10-25%) confidence

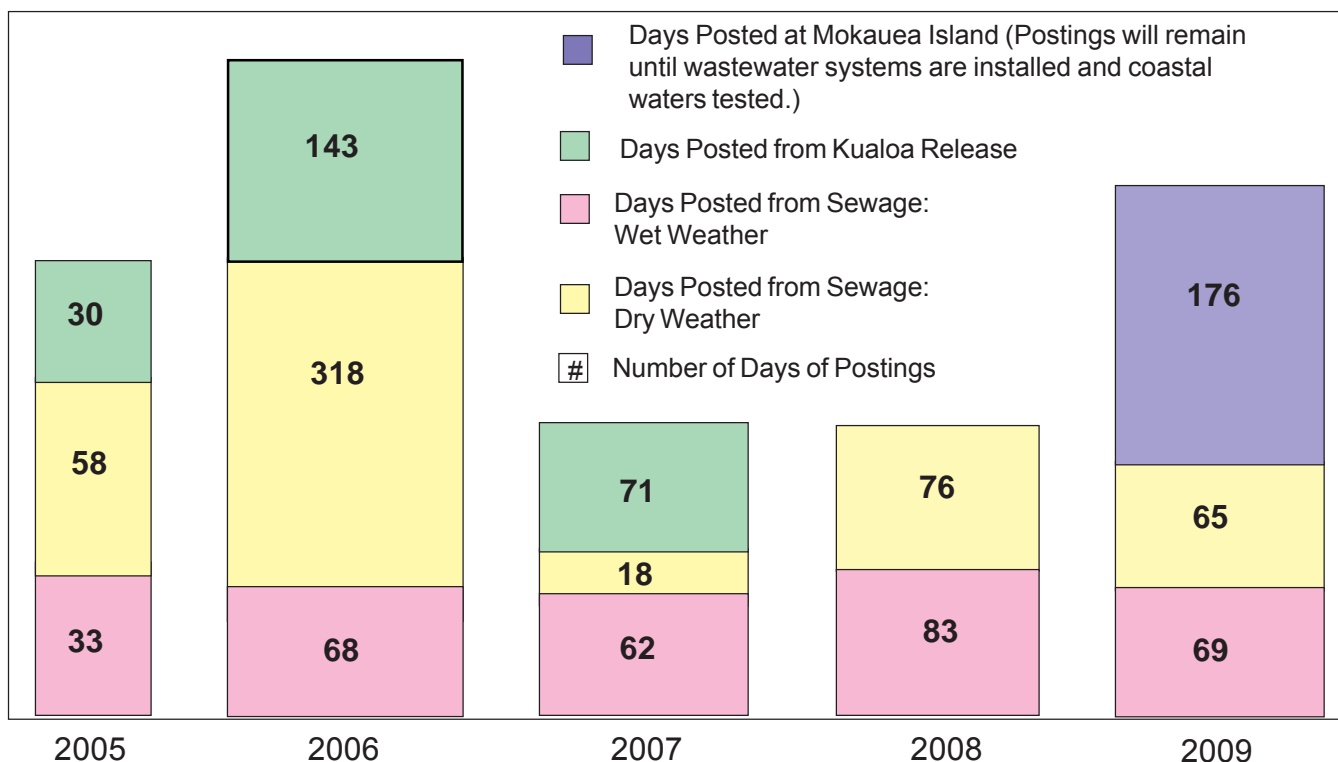
Calendar Year	Total Days Per Year Shorelines Posted	Days Posted from Sewage Events
2005	121	121
2006	529	368
2007	151	151
2008	159	159
2009*	310	310

Notes:

- i) These numbers do not reflect postings of warning signs on streams, lakes, and other inland waters, such as the Ala Wai Canal.
- ii) Other agencies may also post other shoreline warning signs. For example, the City and County of Honolulu posts warning signs on beaches after opening stream mouths to drain water. These are not included in this table.
- iii) This does not include "brown water advisories" which are general media releases anticipating or responding to heavy storm water runoff and are not accompanied by actual postings.

* State fiscal year, July 1, 2008 to June 30, 2009

Shoreline Postings Due to Water Pollution*



*Schematic graph - not to scale

Percentage of Wastewater Recycled Annually

Explanation: Wastewater recycling (or reuse of water treated to a level appropriate for irrigation purposes) has stayed in the range of 23.5 to 24.6 million gallons per day (MGD) between 2005 and 2009. In 2008, there was a slight decrease in wastewater reuse because the Waikoloa Resort wastewater treatment plant, which produces approximately 0.5 MGD of R-2 water, stopped using their effluent for reuse. Waikoloa Resort constructed homes around the perimeter of the golf course that did not meet the 500' buffer distance for spray irrigation of R-2 water. Therefore, they ceased using the R-2 water from the plant for irrigation of their golf course. In 2009, the amount of water reuse did not change from the prior year.

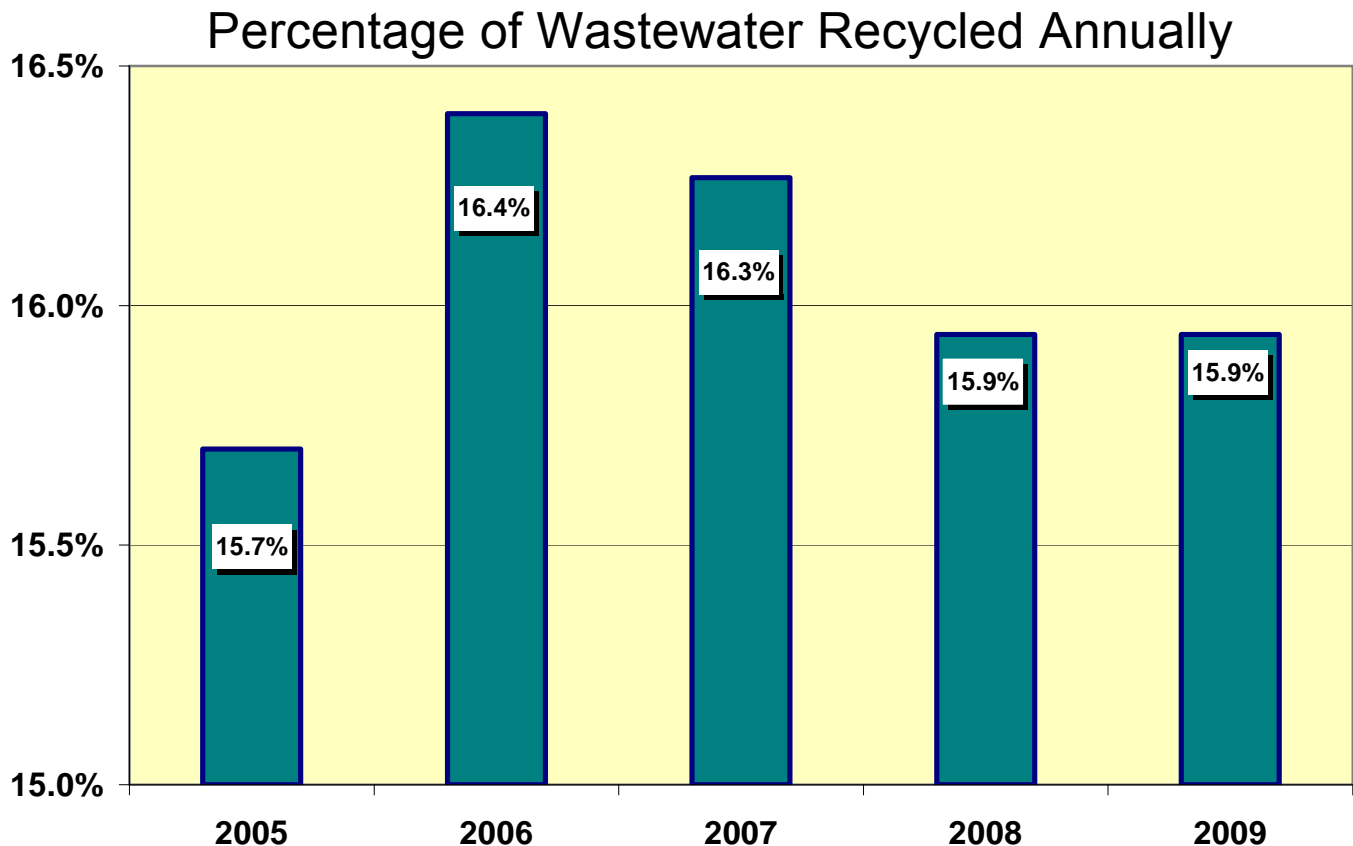
Implications: DOH has plans to encourage reuse to about 30 MGD, or about 20%, by 2015. However, there are concerns that this goal may not be realized, in part due to lack of staff to work on the program and the fiscal implications of implementing water reuse projects.

Data Quality: High (\pm 5-10%) confidence.

Source: Sina Pruder, Tomas See (WWB).

Data are not required by the EPA

FFY	Total Wastewater Treated (MGD)	Wastewater Reused (MGD)	Percent Reused
2005	150.0	23.5	15.7%
2006	150.0	24.6	16.4%
2007	150.0	24.4	16.3%
2008	150.0	23.9	15.9%
2009	150.0	23.9	15.9%



Wastewater Treatment Plant Operations and Maintenance Compliance

Explanation: More operation and maintenance (O&M) inspections were conducted in FY 2009 due to increased staffing levels in the Wastewater Branch. Of the 119 plants inspected, 68 percent were in compliance. O&M deficiencies, effluent violations, and permit violations, including expired underground injection permits (page 19) caused unacceptable plant ratings. Many owners and operators were unaware of the DOH rules requiring permits. The Wastewater Branch is considering discontinuing the permit program in 2010. DOH can still enforce without a permit in place, and the permit system has not produced the anticipated benefits while increasing workloads.

Implications: The Wastewater Branch goal of 90% compliance by 2010 is jeopardized by the foregoing problems. Good O&M leads to fewer plant and equipment breakdowns and sewage spills, and to a safer environment. WWB inspectors are educating operators in the field about permit requirements.

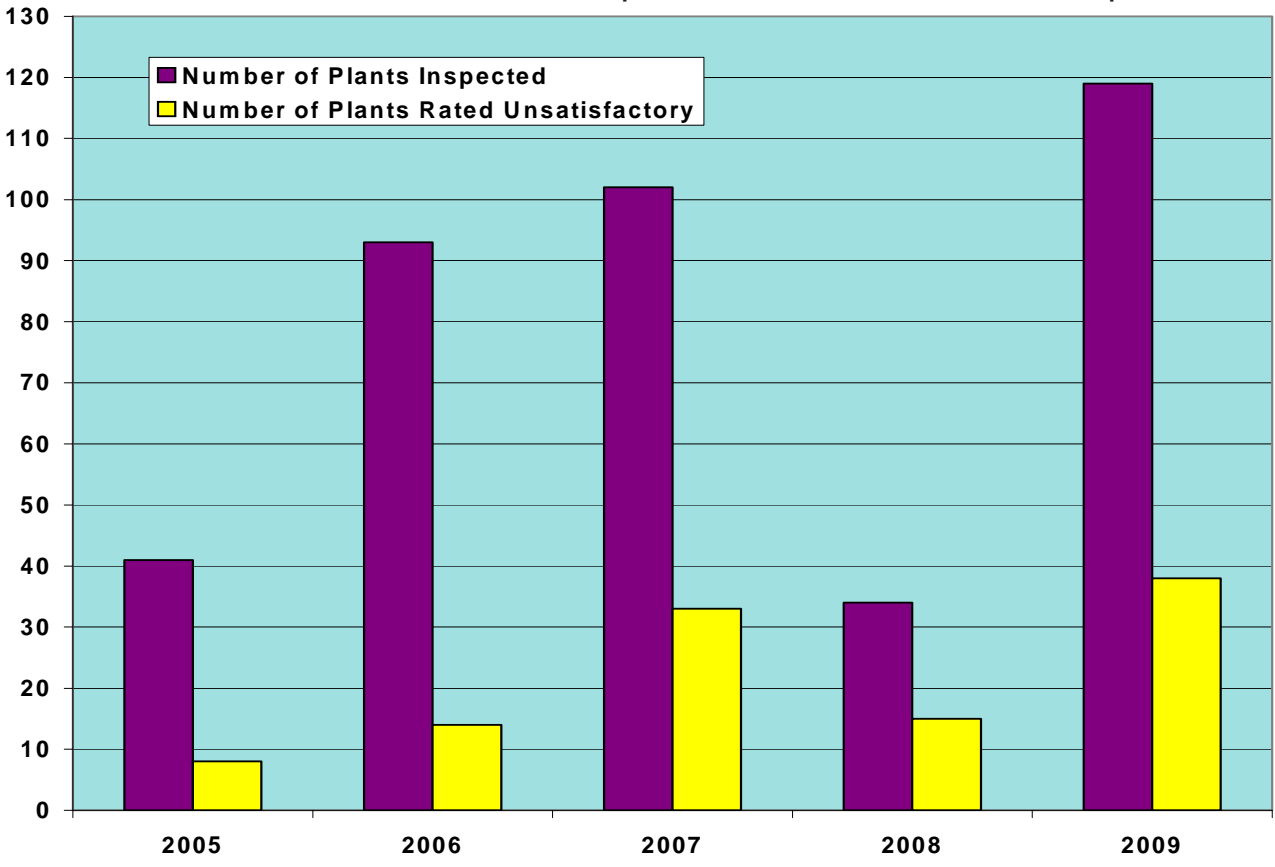
State FY	Total Number of Plants	Number of Plants Inspected	Number of Plants Rated Unsatisfactory	Percent in Compliance
2005	180	41	8	80%
2006	180	93	14	85%
2007	180	102	33	68%
2008	180	34	15	56%
2009	180	119	38	68%

Data are not required by the EPA

Source: Marshall Lum (WWB).

Data Quality: High (± 5-10% confidence).

Wastewater Treatment Plant Operation & Maintenance Compliance



Number of Impaired Streams Listed, 2006

Explanation: This stream quality indicator is based on the “2006 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the US Environmental Protection Agency and the US Congress Pursuant to Sections §303(d) and §305(b), Clean Water Act (P.L. 97-117).” The report identifies waters where our analysis of readily available data indicated non-attainment of State water quality standards, based on the criteria explained in the report (please see www.hawaii.gov/health/environmental/envplanning/wqm/). The 2006 report includes 17 new streams that were not listed in 2004. Several changes occurred within the listings including one delisting and a further refinement of tributaries and estuary systems. Total Maximum Daily Loads (TMDLs) of pollutants must eventually be developed for all waterbodies on the List of Impaired Waters. TMDLs have been established for four Oahu waterbodies (the Ala Wai Canal, Waimanalo Stream, Kapa’a and Kawa Stream), and for two Kauai waterbodies (Hanalei and Nawiliwili). Other stream TMDLs are near completion for Kaukonahua, above Wahiawa (Oahu) and Kaneohe (Oahu). Work continues on the TMDLs for Waiakea and Alenaio Streams (Hawaii) and Pearl Harbor and Ka’elepulu (Oahu). New TMDL development projects are underway in Nuuanu and Kalihi (Oahu). The report for 2008/2010 is under development.

Implications: This stream quality indicator refers only to the inland part of a watershed with freshwater flows that have salinity lower than 0.5 parts per thousand (ppt), including all stream tributaries. The identification of these streams initiates a process that identifies pollutant sources so that agencies, nonprofits, businesses, and community groups can begin to control these sources of pollution, improve water quality, and protect and enhance aquatic ecosystem health.

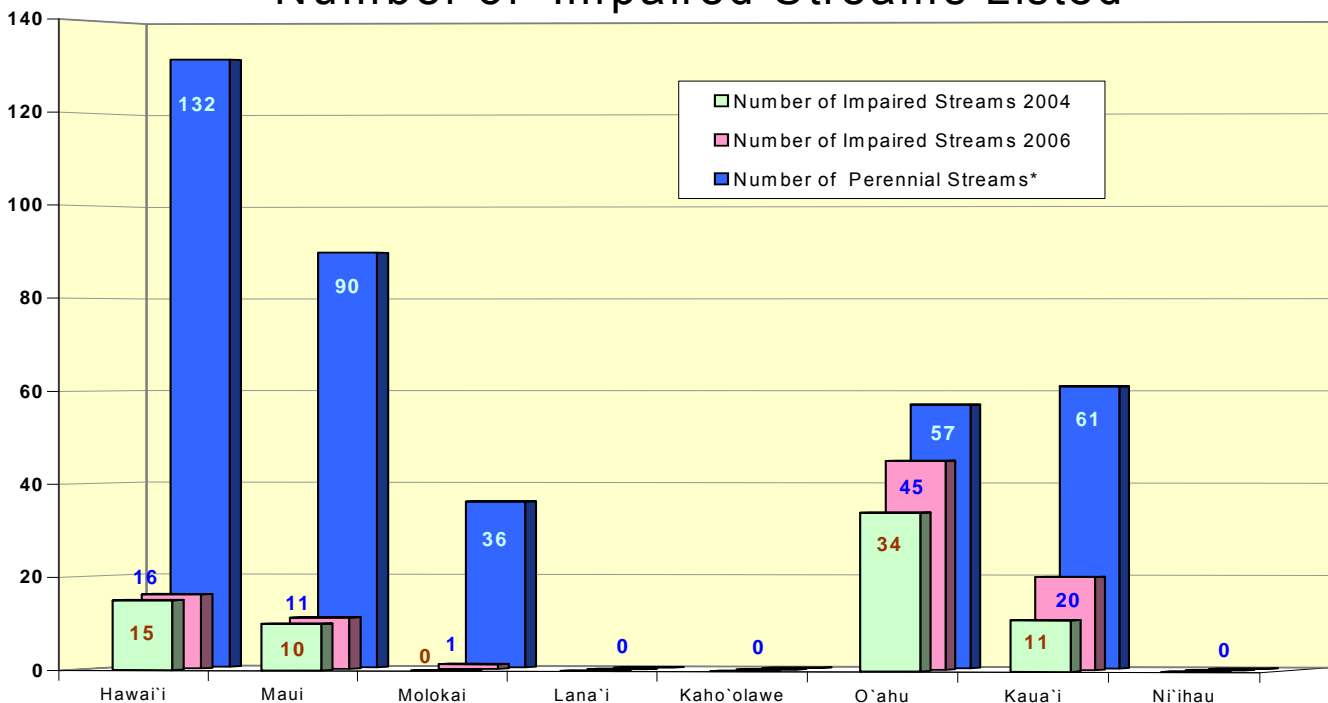
Data Quality:
Medium/High (70-80%)
confidence.

Source: Linda Koch (EPO)

Data are required by EPA.

Island	Number of Impaired Streams 2006	Number of Impaired Streams 2004	Number of Perennial Streams*
Hawai'i	16	15	132
Maui	11	10	90
Molokai	1	0	36
Lana'i	0	0	0
Kaho'olawe	0	0	0
O'ahu	45	34	57
Kaua'i	20	11	61
Ni'ihau	0	0	0
TOTAL	93	70	376

Number of Impaired Streams Listed



*As identified in the 1990 Hawaii Stream Assessment
(Commission on Water Resource Management and National Park Service)

Number of Impaired Coastal Waters Listed, 2006

Explanation: This coastal waters indicator is based on the “2006 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the US Environmental Protection Agency and the US Congress Pursuant to Sections §303(d) and §305(b), Clean Water Act (P.L. 97-117).” The report identifies waters where our analysis of readily available data indicated non-attainment of State water quality standards, based on the criteria explained in the report (please see www.hawaii.gov/health/environmental/envplanning/wqm/wqm.htm).

DOH’s 2006 303(d) List contains a total of 209 marine areas. The breakdown for the individual islands (number of listed waters per island/total number of listed waters) are: Kauai 26 (13% of total), Oahu 71 (34% of total), Molokai 3 (1% of total), Lanai 6 (3% of total), Maui 72 (34% of total), and Hawaii 31 (15% of total). Marine decision units (boundaries for water areas for analyses) were changed from the 2004 303(d)/305(b) List to the 2006 List, making direct comparison impractical. The boundaries will continue to be refined in the future. In general, 10 acceptable quality samples were required to change the status of a decision unit (water area) from its 2004 evaluation. The report for 2008/2010 is under development.

Implications: Turbidity was the most common pollutant to marine water listings with 154 occurrences. The HIDOH believes these are due to polluted runoff, and is focusing its polluted runoff control program on selected watersheds to make measurable improvements.

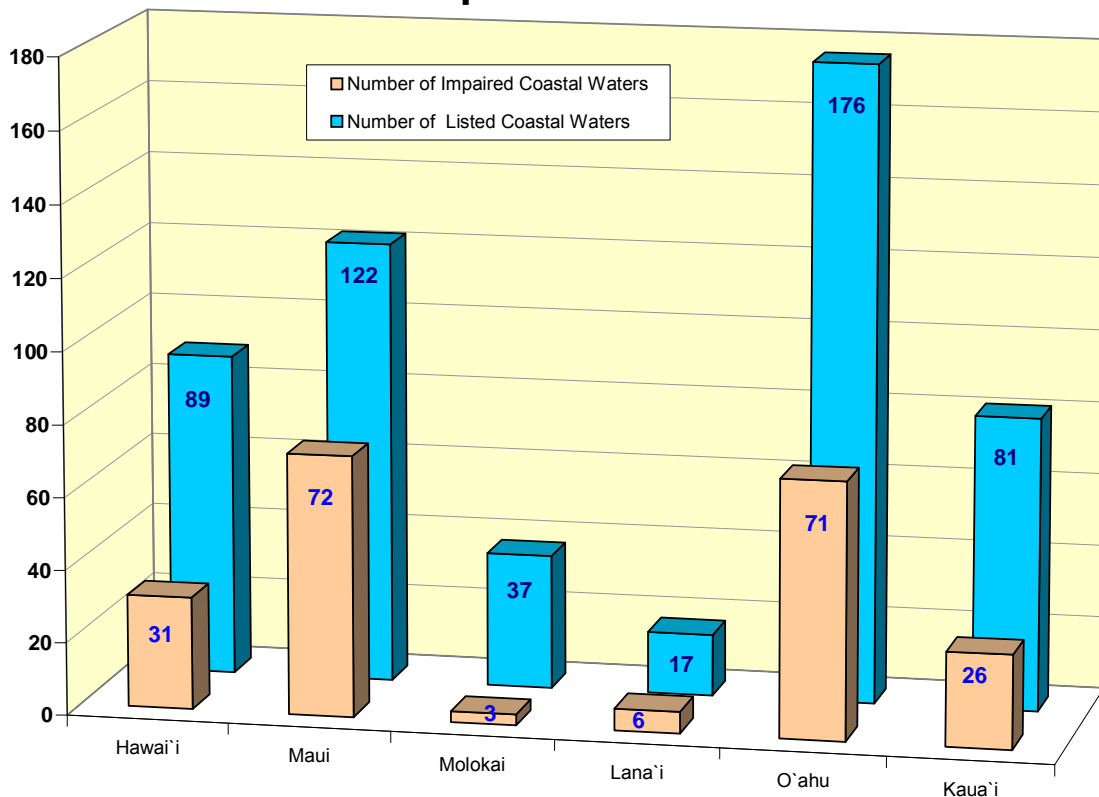
Data Quality:
Medium/High (70-80%)
confidence.

Source: CWB

Data are required by EPA.

Island	Number of Impaired Coastal Waters	Number of Coastal Waters
Hawai'i	31	89
Maui	72	122
Molokai	3	37
Lana'i	6	17
O'ahu	71	176
Kaua'i	26	81
TOTAL	209	522

Number of Impaired Coastal Waters Listed



Oil and Chemical Releases to Land and Water

Explanation: Any releases of oil or chemicals must be reported to DOH. No clear trend exists in the number of oil and chemical releases from 2005 to 2009. The database currently contains only initial information regarding a release. Follow-up information on releases (including volumes of releases) is not included. In 2009, the data was divided into releases to land and releases to water.

Implications: Hazard Evaluation and Emergency Response (HEER) office crews respond to roughly 400-500 'spills' each year. Most are minor, a few are major, and some are false alarms. An increase in the number of releases does not necessarily correlate with an increase in damage to the environment.

Data Quality: Medium (\pm 10-25%) confidence.

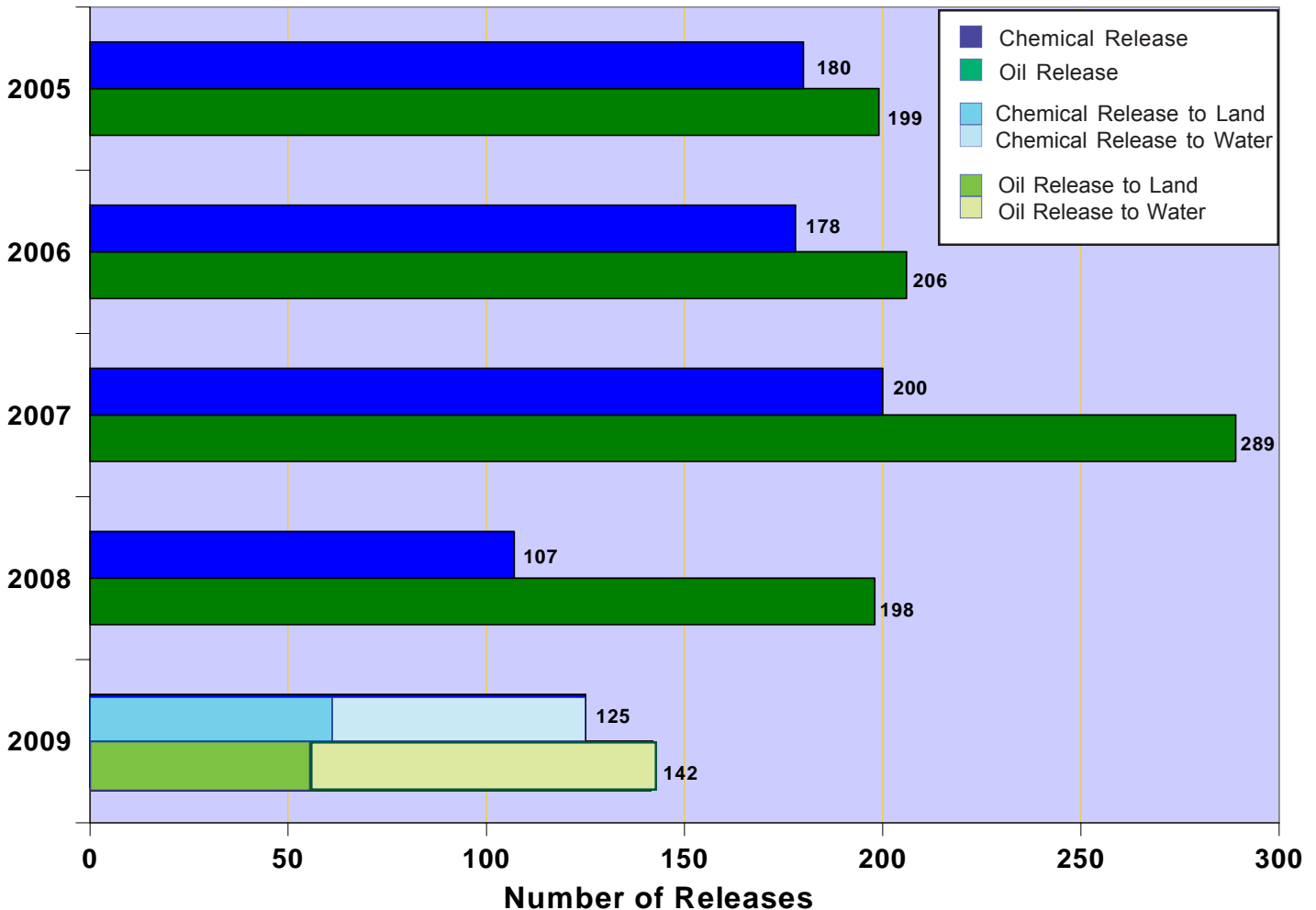
Source: Marsha Mealey (HEER).

Data are not required by the EPA

Oil & Chemical Release Data		
FFY	Oil Releases	Chemical Releases
2005	199	180
2006	206	178
2007	289	200
2008	198	107

FFY	Oil Releases to Land	Oil Releases to Water	Oil Releases Total	Chemical Releases to Land	Chemical Releases to Water	Chemical Releases Total
2009	56	87	142	62	63	125

Oil & Chemical Releases to Land and Water



Toxics Release Inventory, Hawaii Report 2008

EPA has made public the 2008 data on toxic chemicals that were released to Hawaii's air, water and land. This information comes from the Toxics Release Inventory (TRI), a federal community right-to-know program. In Hawaii, 39 facilities reported a total of nearly 3.2 million pounds of toxic chemical releases*.

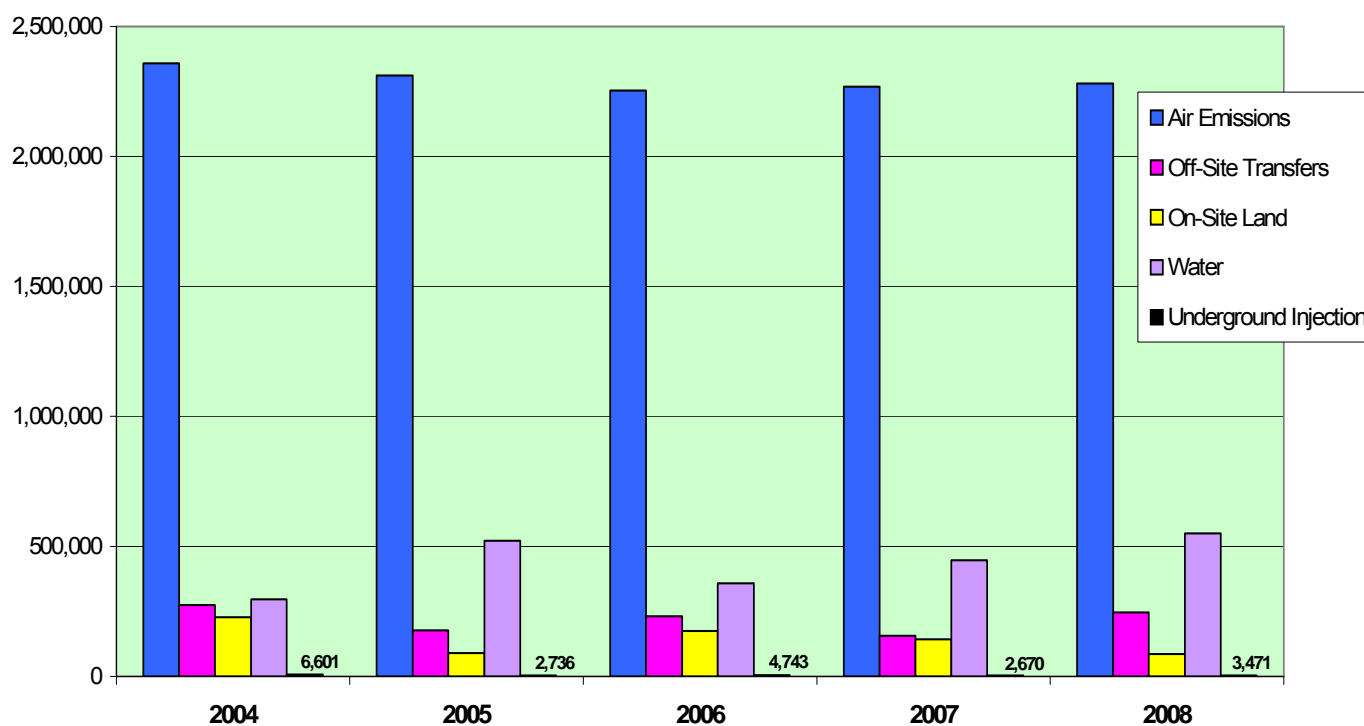
Hawaii's total reported on-site and off-site releases had a 5% increase (150,000 pounds) when compared to the 2007 data. There was a 23% increase in reported releases to water, mostly from the U.S. Navy Pearl Harbor Naval Complex, which increased its water releases by 160,000 pounds. On-site land releases decreased by 40% (57,000 lbs) in part to U.S. Army Schofield not reporting on-site releases for 2008. Two U.S. Marine facilities also reported decreases in their numbers from 2007 to 2008. There was a 57% increase in reported transfers off-site for disposal and other waste management. This was primarily due to AES Hawaii, Inc., reporting 85,000 pounds more than the previous year. Releases to air increased by 1%, mainly from an increase by Hawaii Electric of 14 thousand pounds over releases reported in 2007. Underground injection releases increased by 30% led by Tesoro Hawaii Refinery, which increased its total underground injection releases by 801 pounds.

For more detailed information, including information about Persistent, Bioaccumulative, and Toxic (PBT) chemicals, refer to the EPA website at: www.epa.gov/region09/toxic/tri.

**"Release "is defined as the amount of a toxic chemical released on-site (to air, water, underground injection, landfills and other land disposal), and the amount transferred off-site for disposal. It is important to note that "release" should not be directly equated with "risk." To evaluate risk, release data must be combined with information about chemical toxicity, site-specific conditions, and exposure.*

FFY	Air Emissions	Off-Site Transfers	On-Site Land	Water	Underground Injection	Total
2004	2,358,736	274,015	227,719	296,415	6,601	3,163,486
2005	2,311,635	176,408	89,734	522,217	2,736	3,102,730
2006	2,254,027	230,678	174,678	358,266	4,743	3,022,392
2007	2,267,707	156,048	143,011	446,948	2,670	3,016,384
2008	2,281,298	245,556	86,391	549,838	3,471	3,166,554

Data are not required of DOH by EPA, but EPA does require data from private industries.





For More Information:

State of Hawaii, Department of Health
Environmental Health Administration

www.hawaii.gov/health/environmental

Deputy Director for Environmental Health **586-4424**

Environmental Health Administration Offices:

Compliance Assistance 586-4528

Environmental Planning 586-4337

Environmental Resources 586-4575

Hazard Evaluation & Emergency Response 586-4249

Environmental Management Division **586-4304**

Clean Air Branch 586-4200

Clean Water Branch 586-4309

Safe Drinking Water Branch 586-4258

Solid & Hazardous Waste Branch 586-4226

Wastewater Branch 586-4294

Environmental Health Services Division **586-4576**

Food & Drug Branch 586-4725

Indoor and Radiological Health Branch 586-4700

Sanitation Branch 586-8000

Vector Control Branch
(Now under Sanitation Branch) 586-8000

State Laboratories Division **453-6652**