TECHNICAL NOTE

USDA NATURAL RESOURCES CONSERVATION SERVICE HAWAII

Water Technical Note - No. 12

FINAL 2004 LIST OF IMPAIRED WATERS IN HAWAII

The document "Final 2004 List of Impaired Waters in Hawaii, Prepared Under Clean Water Act §303(d)" was developed by the State of Hawaii, Department of Health. It includes information which may be used as a reference to complete Water Quality Technical Note No. 1, Water Quality Risk Assessment or for other water quality assessments.

A paper copy of the document is not included as part of this technical note because it is very long (67 pages). The document is available online at the following websites:

- NRCS Hawaii: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/
- Hawaii Department of Health: http://www.state.hi.us/health/environmental/env-planning/wqm/303dpcfinal.pdf.

Following is the Executive Summary from the document:

EXCUTIVE SUMMARY

The 2004 List of Water Quality-Limited Segments, plus a priority ranking of listed waters, based on the severity of pollution and the uses of the waters, must be submitted by HIDOH to EPA for approval by April 1, 2004. Computation of TMDLs for all listed pollutant/waterbody combinations, prepared in accordance with the priority rankings, must follow EPA approval of each state's List within a reasonable period of time.

Hawaii's 2002 List and data collected from these and other State water bodies over the past six years constitute the body of information reviewed for the 2004 List report. Decisions to either list or not list a water body, for which data exist and have been reviewed, must be documented (40 CFR §130.7). The periodic listing process allows HIDOH to list waterbodies, which after recent sampling, show exceedances of State Water Quality Standards; delist waterbodies, which do not after further sampling show exceedances for listed parameters; and more clearly articulate the parameters for which previously listed waterbodies remain listed.

HIDOH's 2004 303(d) List includes the 2002 list of 59 streams and 139 coastal stations, plus 11 new streams and 35 new coastal stations. The 2004 List contains a total of 70 streams and 174 coastal stations. No waters were entirely delisted, but there were many changes within the parameters of listed waterbodies.

FINAL
2004 LIST OF IMPAIRED WATERS IN HAWAII
PREPARED UNDER CLEAN WATER ACT §303(d)

Kaukonahua Stream below Wahiawa Reservoir

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June 16, 2004

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INTRODUCTION

The federal Clean Water Act (CWA) requires states to prepare and submit biennial lists of waterbodies not expected to meet state water quality standards, even after application of technology-based effluent limitations to the U.S. Environmental Protection Agency (EPA). [1] This list is referred to as the 303(d) List of Impaired Waters, the 303(d) List, or simply the List. States are required to obtain and review all existing and readily available surface water quality data and related information to compare against the state's Water Quality Standards, and after applying listing criteria, make a decision as to the level of impairment for that waterbody. The listing requirements apply to water bodies impaired by point and/or nonpoint sources of pollution and include a requirement for listing of those pollutants for which applicable water quality standards are exceeded. Under section 305(b) of the Clean Water Act, states are also required to report biennially on the overall status of water quality, including waters that meet water quality standards and those that do not.

EPA's guidance[2] for compiling the 2004 303(d) and 305(b) reports urges states to begin integrating their 303(d) Lists and 305(b) Reports to ensure that consistent methodologies are applied in the preparation of both documents. EPA expects states to sort their surface waters into 5 non-overlapping categories:

(1) All designated uses are met;
(2) Some designated uses are met, but data are insufficient to support a decision on the remaining designated uses;
(3) Data are insufficient to support a decision on whether any designated uses are met;
(4) A waterbody is impaired or threatened but a Total Maximum Daily Load (TMDL) is not needed if
    a. A TMDL has been completed for all listed parameters;
    b. Required control measures are expected to result in Water Quality Standards (WQS) attainment in a reasonable period of time;
    c. The impairment of threat is not caused by a pollutant;
(5) Water is impaired or threatened and a TMDL is needed.

Hawaii State Department of Health (HIDOH) has sorted State surface waters into these five categories, insofar as sorting decisions are supported by the available data (TABLE 6). This report only includes evaluation of the data collected for surface waters within the state of Hawaii and does not include any discussion of ground water.

The 2004 List of Water Quality-Limited Segments, plus a priority ranking of listed waters, based on the severity of pollution and the uses of the waters, must be submitted by HIDOH to EPA for approval by April 1, 2004. Computation of TMDLs for all listed pollutant/waterbody combinations, prepared in accordance with the priority rankings, must follow EPA approval of each state's List within a reasonable period of time.

[1] (CWA §303(d); 40 CFR §130.2; 130.7
[2] Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act (July 21, 2003)

Hawaii's 2002 List and data collected from these and other State water bodies over the past six years constitute the body of information reviewed for the 2004 List report. Decisions to either list or not list a water body, for which data exist and have been reviewed, must be documented (40 CFR §130.7). The periodic listing process allows HIDOH to list waterbodies, which after recent sampling, show exceedances; delist waterbodies, which do not after further sampling show exceedances for listed parameters; and more clearly articulate the parameters for which previously listed waterbodies should be listed.

HIDOH's 2004 303(d) List includes the 2002 list of 59 streams and 139 coastal stations, plus 11 new streams and 35 new coastal stations. The 2004 List contains a total of 70 streams and 174 coastal stations. No waters were entirely delisted, but there were many changes within the parameters of listed waterbodies.

METHODS

To provide both documentation and consistency when making listing decisions, HIDOH has developed a methodology for preparing the 2004 List (Appendix A). The "2004 Listing & Delisting Criteria for Hawaii State Surface Waters Compiled under Clean Water Act 303(d)" describes the sources of Hawaiian water quality data, data quality requirements, limits on the age of data and sample sizes, and the amount of narrative information needed to sort data into one of three priority categories for making listing decisions. Use of standard criteria will enable the HIDOH to periodically collect and/or assess data sets and make decisions on whether a water body should be listed, not listed or delisted in any subsequent listing cycle. Note that the same information requirements apply to delisting as well as listing decisions. Data sets and supporting documentation were evaluated against both numeric and narrative criteria where applicable. For streams, generally, listings apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of a stream system unless a case is documented in which the watershed approach is not applicable.

State Water Quality Standards (WQS)[3] for conventional pollutants, such as nutrients and sediments, are expressed in a statistical format that presents criteria in the form of geometric means not to be exceeded by the geometric mean values computed from data sets. Two storm event allowances are included (the 10% geometric mean, not to be exceeded by more than 10% of the sample values, and the 2% geometric mean, not to be exceeded by more than 2% of the sample values). The WQS are further divided into "wet" and "dry" criteria, which, for streams, refer to the "wet" season as November through April and the remainder of the year as the "dry" season. For embayments and coastal waters, these terms refer to shorelines where more than 3 million gallons per day (mgd) of water are discharged from land per shoreline mile ("wet") and shorelines with less than 3 mgd discharge ("dry").

In accordance with the listing/delisting criteria (Appendix A), waterbodies were sorted into one of three categories. Priority 1 waters have sufficient data to clearly support a listing/delisting decision based on separate wet and/or dry conditions. Priority 2 waters have limited data, which requires HIDOH to use a weight-of-evidence approach for listing/delisting decisions. Priority 3 waters have extremely limited data and require future monitoring before a listing decision can be

[3] Hawaii Administrative Rules, Chapter 11-54

made. For conventional pollutants, a minimum of ten samples from the wet season and/or ten samples from the dry season is required for Listing Priority 1 eligibility[4]. A minimum sample size of ten from a combined grouping of wet and dry conditions is required for Listing Priority 2a, and five to nine samples are required for eligibility for Listing Priority 2b. Any fewer than five samples result in the assignment of the water body and its numeric data into Listing Priority 3 (waters needing additional monitoring before a decision can be made to list, or not list).

When sample sizes are near ten, only the overall sample geometric mean can be computed. If larger sample sizes are available, the sample measurements can be sorted into 10%, 2%, wet and dry criteria tables as a function of the number of measurements available in any of these categories. FIGURE 1 illustrates the general process for listing/delisting conventional pollutants.

For toxic pollutants such as pesticides and heavy metals, which often require expensive analyses, a minimum sample size of three is required for eligibility for Listing Priority 1. Toxic pollutants are characterized by fresh water and saltwater acute and chronic concentration criteria, and fish consumption criteria. FIGURE 2 describes the general process for listing/delisting toxic pollutants.

Criteria for indicator bacteria, used to evaluate waters for public health risks, differ for inland and marine waters. Indicator bacteria counts are evaluated using a minimum sample size of ten, with no allowance for 10%, 2% or wet/dry variations.

Biological surveys of aquatic communities, fish consumption advisories and reports of contaminated sediments are also eligible sources of listing information. These surveys are most likely to be placed in Listing Priority 3. Data sets for evaluation of narrative criteria must include at least 3 sampling events and represent conditions in both the wet and dry seasons. These narrative criteria may be evaluated using HIDOH-approved habitat or biological assessments as long as they can be directly correlated to specific narrative criteria in HAR 11-54-04. Also, in accordance with HAR 11-54-04(b)(2)(A), acute toxicity standards for sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that HIDOH deems them appropriate for use in the Hawaiian environment (CCME 1999; NYSDEC 1999). FIGURE 3 describes the general process for listing/delisting based on narrative criteria.

Basic methods for analysis remained constant among all data sources reviewed. Data were combined and sorted by station number based on the coding system adopted from the Hawaii Stream Assessment (COWRM and NPS 1990). Data for all streams were separated into the three priority categories according to sample size. All data sets were distributed over time (within the six-year window from 1997-2003) and space (for inland waters, from upper and lower sampling sites, and for coastal waters, across the waterbody or station area). For instance, if several data values were available from one day and one site, the geomean would not be deemed sufficiently representative to support a listing decision. More data would need to be collected to evaluate that waterbody. Photographs, visual assessments, written descriptions and appropriate QA/QC measures also should exist for the sampling sites.

[4] These priority listings are also applicable to marine systems where the freshwater discharge volume determines wet and dry conditions.

Basic Process for Listing/Delisting Conventional Pollutants (FIGURE 1)

Priority 1 waterbodies were sorted by station number. The data were then reviewed to determine whether 10 samples existed for comparison to either the wet or the dry standard. If a waterbody had 10 samples in either the wet or dry condition or both, the samples were sorted by condition, and the geometric mean was calculated for the condition and evaluated against the corresponding wet and/or dry standards. If 10 samples were not present for comparison to a particular condition and the data were spread between both wet and dry conditions, the data were combined and the geometric means for each waterbody were evaluated against the wet standards. For statistical significance, the "10% of the time" criteria are evaluated with a minimum sample size of 100 samples. The "2% of the time" criteria are evaluated with a minimum sample size of 500 samples. HIDOH reasons that environmental variability precludes the application of these criteria to smaller data sets due to the sizeable fluctuations that occur in natural systems. In any event, the data sets available to HIDOH were not large enough to apply the 10% or 2% standards. If wet and dry condition data are combined because insufficient sample sizes exist to evaluate the standards separately and the geometric mean of these data only exceeds the dry standard, a majority of the raw data dry condition samples must exceed the dry standard to warrant listing.

Waterbodies with 5-9 samples were placed in the Priority 2b category, sorted by station number and then reviewed to determine if any of the samples exceeded the corresponding wet or dry standards. If any of the samples from a particular waterbody exceeded the standard by a factor of 2 or more, the data set was reviewed to see if there were at least 5 samples from the corresponding wet or dry condition. If sufficient data were present, the geometric mean was calculated to determine whether the corresponding standard was exceeded by a factor of 2. Waterbodies that did not meet Priority 2 criteria were compiled for future monitoring (APPENDIX C).

FIGURE 1: Flow Chart of Listing/Delisting Process for Conventional Pollutants

(turbidity, total suspended solids, nutrients, chlorophyll a, temperature, dissolved oxygen, pH and indicator bacteria)

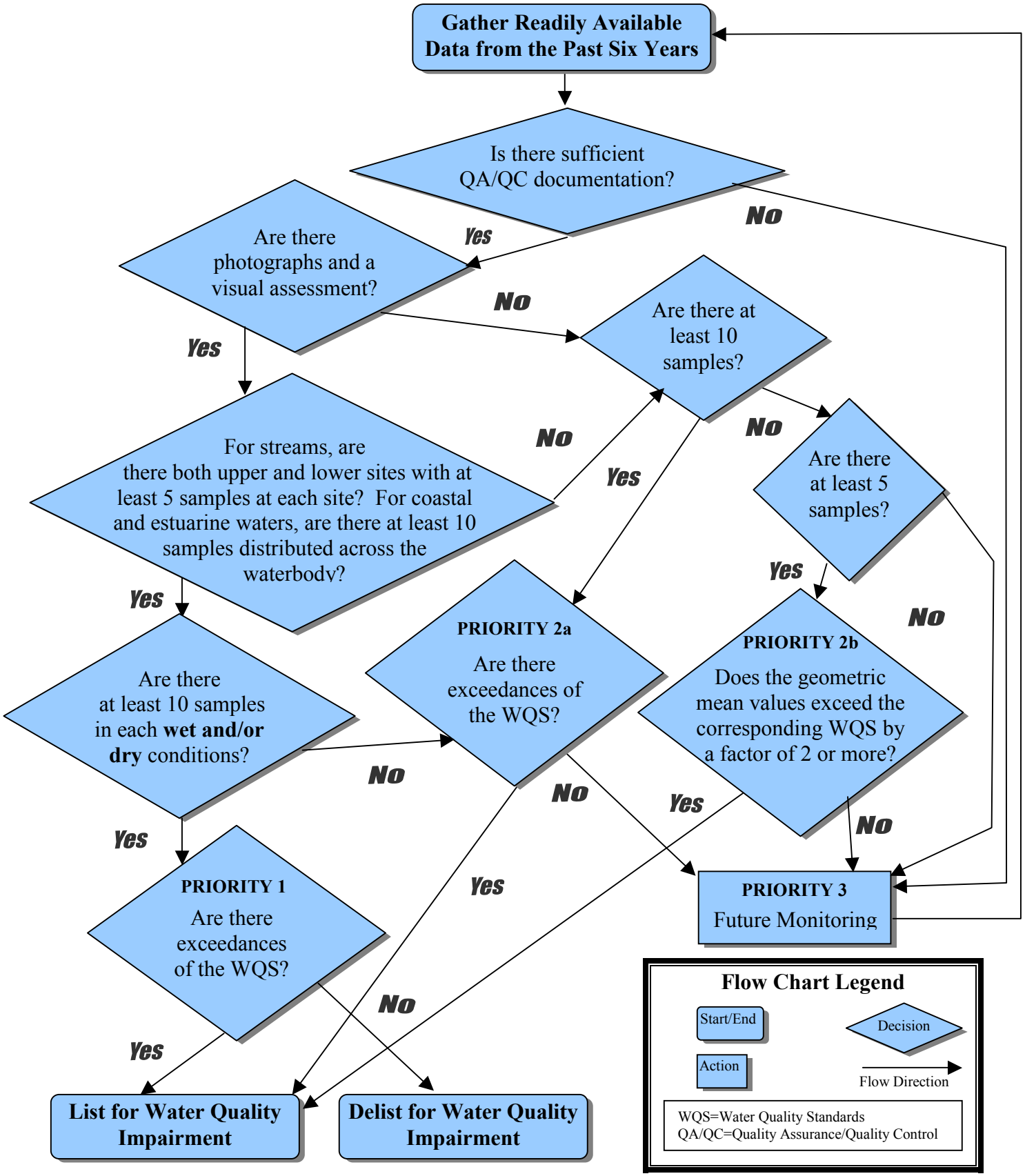


FIGURE 2: Flow Chart of Listing/Delisting Process for Toxic Pollutants

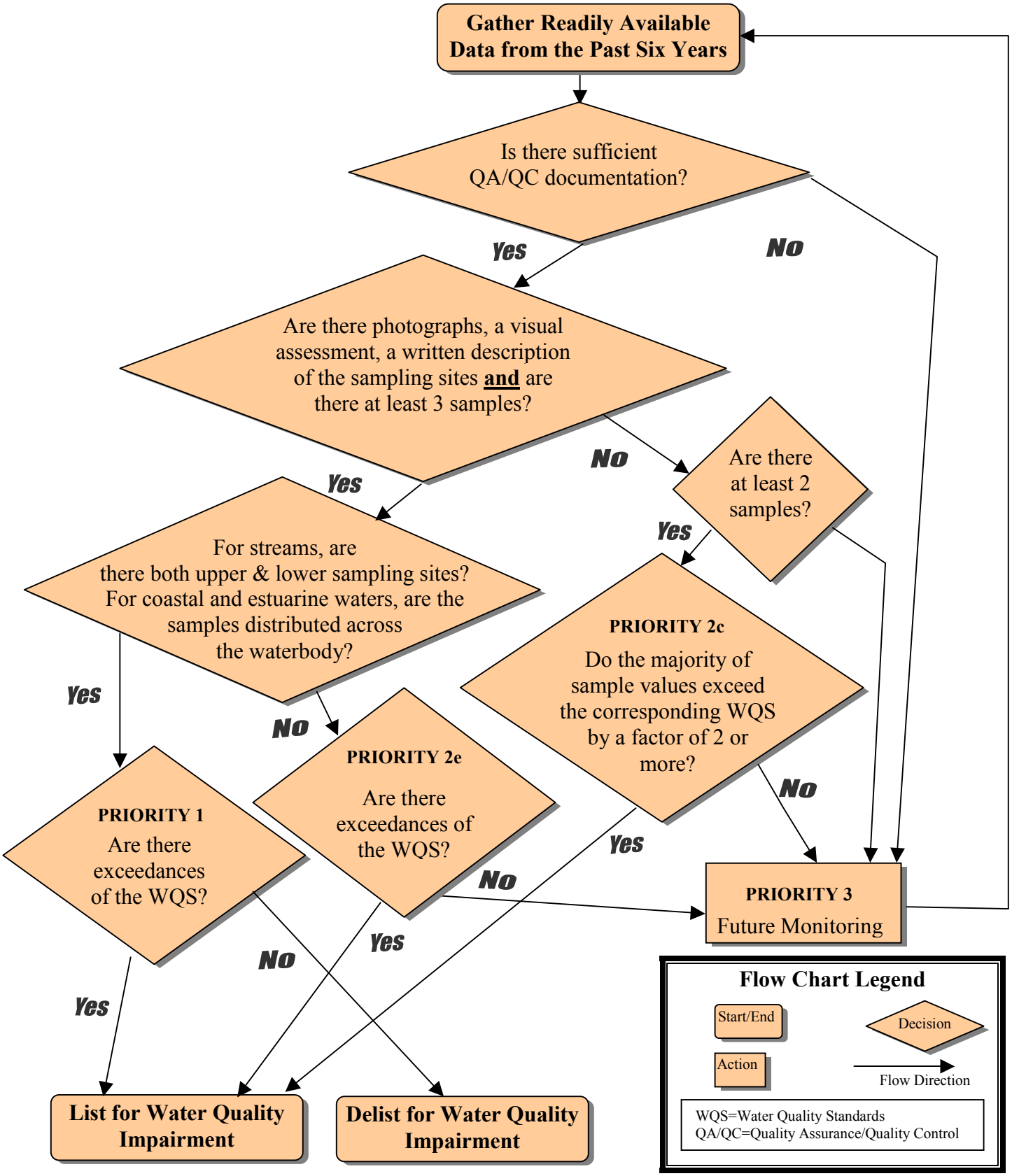
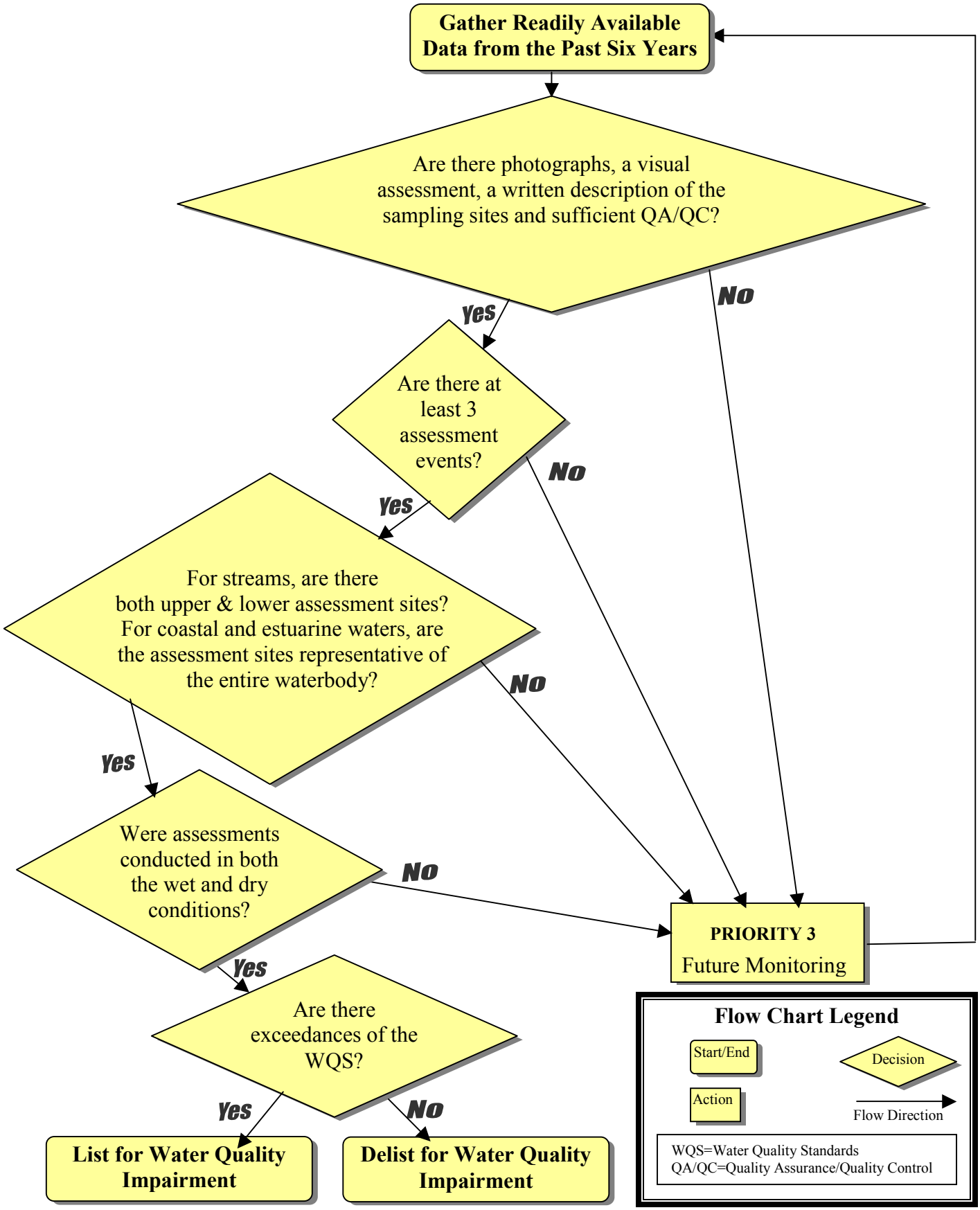


FIGURE 3: Flow Chart of Listing/Delisting Process for Narrative Criteria



Data Sources Reviewed

A formal call for data was published statewide in July 2003; several responses were received. Environmental Planning Office staff also contacted a variety of organizations seeking water quality data that met minimum requirements. A summary of the communications log is attached as Appendix B.

Major data sources reviewed include the following:

1. Review of data collected by HIDOH's Clean Water Branch
   Environmental Planning Office staff summarized data collected from streams and coastal monitoring sites by the Clean Water Branch, Monitoring Section. Lab samples and field samples were sorted separately using the same methodology.

2. USGS North American Water Quality Assessment Program (NAWQA)
   The organochlorine pesticide, PCB concentration, trace element and semi-volatile organic compound data from fish and sediments were reviewed and summarized. However, no new data were presented after those utilized for the 2002 303(d) listing decision-making exercise.

3. Stream surveys conducted by AECOS, Inc., using the National Resource Conservation Service (NRCS) Visual Assessment Protocol, Version 1.0, dated January 31, 2001,.
   2003 visual assessments were conducted by AECOS, Inc. for Hanalei, Heeia, Kahana, Opaekaa, Punaluu, South Wailua, Ukumehame, Waiahole, and Waikapu Streams. Environmental Planning Office staff reviewed these results.

4. Biological Assessments
   Environmental Planning Office (EPO) staff reviewed biological assessments of Nawiliwili Streams; Huleia, Puali, Nawiliwili, and Papakolea, following the process for evaluating narrative standards. These bioassessments were conducted by Mike Kido using his formal protocol, the Hawaii Stream Bioassessment Protocol (HSBP). EPO also reviewed the biological assessments of Kaneohe Stream, conducted by Susan Burr, and Waikele Stream, conducted by Katina Henderson.

5. Other Environmental Assessments and Investigations
   There were no Environmental Assessments related to surface waters available for this report.

6. Other Data Sources

   <u>West Maui - Lahaina and Kihei coastal areas</u>
   Nutrient data from Edward A. Laws Report to DOH, *Coastal Water Quality in West Maui-Lahaina and Kihei,* were reviewed for this report.

Hanalei Watershed area

Data for turbidity and enterococcus from the Hanalei Watershed Hui were reviewed for this report.

Heeia Stream

Under the supervision of Drs. Leticia Colmenares and Dave Krupp, Windward Community College students have been sampling water quality parameters at a number of sites along Heeia and Haiku Streams, estuary and coastal areas. Data are available at http://www.wcc.hawaii.edu/usda/Heeia.

Various Sites

PhD Thesis Dissertation entitled "Fluvial Nitrogen and Phosphorus in Hawaii: Storm Runoff, Land Use, and Impacts on Coastal Waters." by Daniel J. Hoover. Data for various sites were presented in the thesis, but the format of the dissertation did not report the geometric means necessary for comparison to the standards. No raw data were submitted due to the author withholding data pending publication of additional scientific papers.

Kaneohe and Waimanalo Streams

The Final Report entitled "Investigations of Waimanalo and Kaneohe Streams" by Michael S. Tomlinson and Eric H. De Carlo, contained data from studies done of these two streams. The report mentions problems with the reliability of the data due to a variety of sources, including probes buried in the sediment or left drying in air; other QA/QC issues are discussed in the report. The raw data files were not readily accessible. More investigation will be required to determine if this data is usable for decision-making purposes.

Quality Assurance/Quality Control Considerations

Quality Assurance/Quality Control (QA/QC) procedures document data quality by describing data collection and analysis procedures. QA/QC basically answers the questions "Where did those numbers comes from, and why should anyone believe them?" HIDOH's Clean Water Branch, Environmental Planning Office, and Laboratory operate under the terms of a "Quality Management Plan For Surface Water Quality Monitoring," approved by EPA Region IX and dated December 9, 1999.

The USGS/NAQWA program operates under written QA/QC plans approved by the agency. A summary of AECOS QA/QC methods is attached in APPENDIX D.

RESULTS

1. Review of Data Collected by HIDOH's Clean Water Branch

Clean Water Branch (CWB), Monitoring Section, Stream Data

Forty-six streams throughout the islands had sufficient data to evaluate whether an exceedance of the Water Quality Standards occurred. Twenty-two of these streams were already listed on EPA's 2002 303(d) List for at least one parameter. Priority 1 and Priority 2a are grouped together since data for field parameters are more prevalent, and therefore, more likely to satisfy the criteria of at least 10 samples in each wet and/or dry condition. Laboratory data are less likely to have a complete assemblage of data that support separation of the conditions for evaluation. TABLEs 1a and 1b summarize the results of the analysis of Clean Water Branch stream data.

Priority 1
On Oahu, numeric data were obtained for a total of ten streams. Four were previously listed by visual assessment for nutrients. These new data more specifically identify which numeric standards were exceeded in these streams. For all of these streams, the data confirmed the listings for turbidity. Nuuanu Stream, previously listed for nutrients, trash and wet season turbidity, showed an exceedance of for Nitrite/Nitrate and Total Nitrogen, as well as both seasonal turbidity standards. Kalihi Stream, previously listed for nutrients, wet season turbidity and trash, showed no exceedance for wet season turbidity, but data did show an exceedance of Nitrite/Nitrate, Total Nitrogen and dry season turbidity standards. Kaalaea Stream, which was not previously listed, showed Nitrite/Nitrate and Total Nitrogen exceedances. Punaluu Stream showed no exceedance of the standards. (See TABLE 1a.)

On Maui, numeric data were obtained for six streams. Ukumehame Stream, which was previously listed, showed no exceedance of the wet season turbidity standard. Makamakaole Stream, which was previously listed, showed exceedance of the dry turbidity standard. Honokohau, Kahakuloa, Waihee, and Waikapu showed no exceedance of the turbidity standards. See (TABLE 1a.)

On the island of Hawaii, numeric data were obtained for nine streams. Two streams, Kapeha and Lalakea that were not previously listed showed exceedances of the dry season turbidity standard. Additionally, on Hawaii, three streams previously listed for turbidity demonstrated no exceedances. Honolii Stream, previously listed for nutrients and turbidity, showed no exceedances of nutrients and turbidity for the wet standard. Kolekole Stream and Wailuku Stream, both previously listed for nutrients and turbidity, showed no exceedances of nutrients and turbidity for the wet standard. The data also showed no exceedance in the wet season turbidity standard. More sampling is needed for these streams during the dry season. Waikama Stream, previously listed for exceedance of the wet season turbidity standard, showed no exceedance for the wet season, but exceeded the dry season turbidity standard.

On Kauai, numeric data were obtained for thirteen streams. Hanalei River, listed in 2002 for turbidity, showed no exceedance for the wet season turbidity standard. Nawiliwili and Kapaa

Streams, listed in 2002 for turbidity, showed exceedance for the wet season turbidity standard. More sampling is needed for these streams during the dry season. Nawiliwili was not listed for nutrients, however exceedance was demonstrated in Nitrite/Nitrate and Total Nitrogen for the wet season standards. Huleia Stream, listed in 2002 for only turbidity, showed no exceedance for the wet season turbidity standard. Huleia also showed exceedance for the wet season Nitrite/Nitrate standard. Hanapepe River, listed in 2002 for turbidity, showed exceedance for the dry season turbidity standard. See TABLE 1a.

Priority 2

Priority 2a represents streams that have at least 10 representative samples. The data are grouped together to include all wet and dry condition samples for comparison against the standards. Utilizing these criteria, Heeia and Waiahole Streams on Oahu exceeded the Nitrite/Nitrate standard. On Hawaii, Niulii Stream showed no exceedance of the dry season nutrient standards. On Kauai, two new streams, Kilauea and Lawai, showed exceedance of the wet season turbidity standard. Hanamaulu also showed exceedance of wet season turbidity. Maui had no streams that resulted in a 2a priority listing. (See TABLE 1a.)

Priority 2b represents the streams that have between 5 and 9 samples and the geomean exceeded the corresponding standard by a factor of 2. Fourteen streams were grouped together for priority 2b listing. (See TABLE 1b.) Eight streams were listed previously on the 2002 list. Maliko and Waipio streams on Maui, and Wailele and Waimalu streams on Oahu, exceeded the wet season turbidity standard. Hanalei and Kapaa Streams exceeded the dry season turbidity standard. Four previously unlisted streams exceeded the nutrient standards. Lawai Stream on Kauai, and Kaalaea Stream on Oahu, exceeded the dry season Nitrite/Nitrate standard. Kaalaea also exceeded the dry season Total Nitrogen standard. Puali Stream on Kauai and Heeia Stream on Oahu exceeded the wet season Nitrite/Nitrate standard. Kalihi and Nuuanu streams on Oahu, previously listed for nutrients in 2002, exceeded the dry season standard for Nitrite/Nitrate. Kapakahi Stream on Oahu, listed in 2002 for nutrients, exceeded the wet season standards for Nitrite/Nitrate, Total Nitrogen and Total Phosphorus. Wailoa/Waipio Stream on Hawaii, not listed in 2002, exceeded the wet season Nitrite/Nitrate standard by a factor of 2. (See TABLE 1b.)

TABLE 1a: Analytical Summary of Priority 1 and 2a Data - Clean Water Branch Streams

	Stream Code	Waterbody Name	Island	Stream on 2002 List (Y/N)	Pollutants on 2002 List	HIDOH Clean Water Branch Data 1997-2003 Numeric Exceedances				
						TSS	NO3	Total N	Total P	Turbidity
Priority 1 and 2a	2-2-01	Anahola	Kauai	N	None	-	-	-	-	NE*
	2-1-19	Hanalei	Kauai	Y	turbidity-visual	-	-	-	-	NE***
	2-2-12	Hanamaulu	Kauai	Y	turbidity-visual	-	-	-	-	W*
	2-3-07	Hanapepe	Kauai	Y	turbidity-visual	NE*	NE*	NE*	NE*	D**
	2-2-15	Huleia	Kauai	Y	turbidity-visual	NE***	W***	NE***	NE***	NE***
	2-2-04	Kapaa	Kauai	Y	turbidity-visual	-	-	-	-	W***
	2-1-28	Kilauea	Kauai	N	None	-	-	-	-	W*
	2-3-04	Lawai	Kauai	N	None	NE*	NE*	NE*	NE*	W*
	2-2-13	Nawiliwili	Kauai	Y	turbidity-visual	NE***	W***	W***	NE***	W***
	2-1-34	Moloaa	Kauai	N	None	-	-	-	-	NE*
	2-2-08	Opaekaa	Kauai	N	None	NE***	NE***	NE***	NE***	NE***
	2-2-14	Puali	Kauai	N	None	-	-	-	-	NE*
	2-1-18	Waioli	Kauai	N	None	-	-	-	-	NE*
	3-2-08	Heeia	Oahu	N	None	NE*	W*	NE*	NE*	NE*
	3-2-05	Kaalaea	Oahu	N	None	NE***	W***	W***	NE***	NE***
	3-2-07	Kahaluu	Oahu	Y	nutrients-visual turbidity-visual	NE*	NE*	NE*	NE*	D**
	3-1-18	Kahana	Oahu	N	None	-	-	-	-	NE*
	3-4-04	Kalauao	Oahu	N	None	-	-	-	-	NE*
	3-3-11	Kalihi	Oahu	Y	nutrients-visual turbidity-visual trash	NE***	W***	W***	NE***	D****
	3-2-09	Keaahala	Oahu	Y	nutrients-visual turbidity-visual trash	NE****	W,D****	W,D****	D****	D****
	3-3-09	Nuuanu	Oahu	Y	nutrients-visual trash	NE***	W***	W***	NE***	W,D****
	3-1-16	Punaluu	Oahu	N	None	NE***	NE***	NE***	NE***	NE****
	3-2-04	Waiahole	Oahu	N	None	NE*	W*	NE*	NE*	NE*
	3-2-02	Waikane	Oahu	N	None	-	-	-	-	NE*
	4-2-04	Waialua	Molokai	N	None	NE***	NE***	NE***	NE***	NE***

W (Wet Standard Exceedance), D (Dry Standard Exceedance), NE (No Exceedance), - (Insufficient Data)

*Indicates that both wet and dry season samples were combined for analysis since data were not adequate to compare each season separately
**indicates that enough samples from the dry season were present to compare those samples against the dry season standard
***indicates that enough samples from the wet season were present to compare those samples against the wet season standard
****indicates that enough samples were present from both the wet and dry seasons to compare those wet season sample geometric means against the wet season standard and dry season sample geometric means against the dry season standard

No Exceedance found in stream listed in 2002

Exceedance found in stream not listed in 2002

TABLE 1a (continued): Analytical Summary of Priority 1 and 2a Data - Clean Water Branch Streams

	Stream Code	Waterbody Name	Island	Stream on 2002 List (Y/N)	Pollutants on 2002 List	HIDOH Clean Water Branch Data 1997-2003 Numeric Exceedances				
						TSS	NO3	Total N	Total P	Turbidity
Priority 1 and 2a	6-1-11	Honokohau	Maui	N	None	NE*	NE*	NE*	NE*	NE****
	6-2-03	Kahakuloa	Maui	N	None	-	-	-	-	NE*
	6-2-06	Makamakaole	Maui	Y	turbidity	NE***	NE***	NE***	NE***	D****
	6-2-07	Waihee	Maui	N	None	-	-	-	-	NE*
	6-2-10	Waikapu	Maui	N	None	-	-	-	-	NE*
	6-1-01	Ukumehame	Maui	Y	turbidity	NE*	NE*	NE*	NE*	NE***
	8-1-12	Aamakao	Hawaii	Y	turbidity	NE*	NE*	NE*	NE*	D****
	8-2-56	Honolii	Hawaii	Y	nutrients-visual turbidity-visual	NE***	NE***	NE***	NE***	NE***
	8-2-37	Kapeha	Hawaii	N	None	NE***	NE***	NE***	NE***	D****
	8-2-33	Kolekole	Hawaii	Y	nutrients-visual turbidity-visual	NE***	NE***	NE***	NE***	NE****
	8-2-45	Lalakea	Hawaii	N	None	-	-	-	-	D**
	8-1-13	Niulii	Hawaii	Y	turbidity	NE*	NE*	NE*	NE*	D****
	8-1-14	Waikama	Hawaii	Y	turbidity	NE***	NE***	NE***	NE***	D****
	8-2-60	Wailuku	Hawaii	Y	nutrients, turbidity	NE***	NE***	NE***	NE***	NE****
	8-1-09	Wainaia	Hawaii	N	None	-	-	-	-	W***

W (Wet Standard Exceedance), D (Dry Standard Exceedance), NE (No Exceedance), - (Insufficient Data)

*indicates that both wet and dry season samples were combined for analysis because data were not adequate to compare each season separately
**indicates that enough samples from the dry season were present to compare those samples against the dry season standard
***indicates that enough samples from the wet season were present to compare those samples against the wet season standard
****indicates that enough samples were present from both the wet and dry seasons to compare those wet season sample geometric means against the wet season standard and dry season sample geometric means against the dry season standard

No Exceedance found in stream listed in 2002

Exceedance found in stream not listed in 2002

TABLE 1b: Analytical Summary of Priority 2b Data - Clean Water Branch Streams

	Stream Code	Waterbody Name	Island	Stream on 2002 List (Y/N)	Pollutants on 2002 List	HIDOH Clean Water Branch Data 1997-2003 Numeric Exceedances				
						TSS	NO3	Total N	Total P	Turbidity
Priority 2b	2-1-19	Hanalei	Kauai	Y	turbidity-visual	-	-	-	-	D**
	2-2-04	Kapaa	Kauai	Y	turbidity-visual	-	-	-	-	D**
	2-2-14	Puali	Kauai	N		-	W***	-	-	-
	2-3-04	Lawai	Kauai	N		-	D**	-	-	-
	3-2-08	Heeia	Oahu	N		-	W***	-	-	-
	3-2-05	Kaalaea	Oahu	N		-	D**	D**	-	-
	3-4-04	Kalauao	Oahu	N		-	W***	W***	-	-
	3-3-11	Kalihi	Oahu	Y	nutrients-visual	-	D**	-	-	-
		Kapakahi	Oahu	Y	nutrients-visual turbidity-visual trash	-	W***	W***	W***	
	3-3-09	Nuuanu	Oahu	Y	nutrients trash	-	D**	-	-	-
	3-1-08	Wailele	Oahu	Y	turbidity	-	-	-	-	W***
	3-4-05	Waimalu	Oahu	Y	turbidity-visual	-	-	-	-	W*
	6-3-01	Maliko	Maui	Y	turbidity	-	-	-	-	W***
	6-3-10	Waipio	Maui	N		-	-	-	-	W*
	8-1-44	Wailoa/Waipio	Hawaii	N		-	D**	-	-	-

W (Wet Standard Exceedance), D (Dry Standard Exceedance), NE (No Exceedance), - (Insufficient Data)

*indicates that both wet and dry season samples were combined for analysis because data were not adequate to compare each season separately
**indicates that enough samples from the dry season were present to compare those samples against the dry season standard
***indicates that enough samples from the wet season were present to compare those samples against the wet season standard
****indicates that enough samples were present from both the wet and dry seasons to compare those wet season sample geometric means against the wet season standard and dry season sample geometric means against the dry season standard

No Exceedance found in stream listed in 2002

Exceedance found in stream not listed in 2002

Bacterial Data

The current rule requires use of fecal coliforms as the indicator bacteria for evaluating public health risks in inland waters; however, fecal coliforms are rarely enumerated in inland surface water samples and very limited data were available for evaluating this parameter. Exceedances of the public health criteria for marine waters, which use an enterococcus standard of 7 CFU/100 ml seawater as an indicator, are included in Table 7. There were no new listings for bacteria based on Clean Water Branch data.

2. Visual Stream Surveys Conducted by AECOS, Inc

According to the narrative listing criteria, the visual assessment results fall into Priority 3, Future Monitoring (see APPENDIX C). The assessments were conducted only during the

dry season and at least 3 assessments were not completed. The criteria for listing decisions for the narrative standards require 3 assessments conducted with at least one from each wet and dry season. Utilizing these stream surveys does not satisfy the requirement. This data will be compiled for use at a later time; however, general observations can help allocate monitoring resources in the future.

For the two streams that were previously listed (name them), the results of AECOS's assessments were inconsistent with the previously listed impairments. HIDOH does not support future listing determinations based on photographic assessments only; however, delisting of previously listed waters will not occur until the listing/delisting criteria (APPENDIX A) are met. The Hanalei stream system visual assessment does not uphold the 2002 turbidity listing. An observation of heavy algal growth at the upper site signifies that additional future monitoring may be necessary for other parameters, such as nutrients, to evaluate eutrophic potential. The Ukumehamehe stream assessment does not uphold the 2002 listings for dry season turbidity. The visual assessments for the other streams will be compared to numeric data as they become available.

TABLE 2: Summary of 2003 AECOS, Inc. Visual Assessments

Stream System Number*	Stream System Name	Overall Lower Site Score**	Overall Upper Site Score**	Comments
2-1-19	Hanalei	High	High	Requires future monitoring for decision on impairment. Listed in 2002 for turbidity. This assessment does not support that listing.
2-2-08.01	Opaekaa	Medium to High	Medium	Requires future monitoring for decision on impairment.
2-2-08.02	South Wailua	Medium to High	Medium to High	Requires future monitoring for decision on impairment.
3-1-16	Punaluu	Medium to High	Medium to High	Requires future monitoring for decision on impairment. Generally agrees with current data.
3-1-18	Kahana	Middle Site - High	Very High	Requires future monitoring for decision on impairment.
3-2-04	Waiahole	Medium	High to Very High	Requires future monitoring for decision on impairment
3-2-08	Heeia	Low	NA	Requires future monitoring for decision on impairment. Need visual assessment for upper segment. Generally agrees with current data.
6-1-01	Ukumehame	High	High to Very High	Listed in 2002 for turbidity dry standard. Does not agree with 2002 listing.
6-2-10	Waikapu	High	Very High	Requires future monitoring for decision on impairment

These codes denote stream location and were adopted from the Hawaii Stream Assessment (COWRM and NPS 1990). The first number in each code represents the island (2=Kauai, 3=Oahu, 4=Molokai, 6=Maui and 8=Hawaii).
** Low scores imply impaired habitat conditions; High scores imply desirable habitat conditions.

3. Biological Assessments

After reviewing biological assessments of four streams in the Nawiliwili Watershed (Huleia, Papakolea, Nawiliwili and Puali), Environmental Planning Office staff concluded that insufficient data were available to determine whether the streams exceeded the narrative standards. HIDOH is working on developing an appropriate protocol for addressing the application of the narrative standards utilized in biological assessments with the conventional pollutant standards. The biological assessments did not meet the listing/delisting criteria for narrative criteria because assessments were not sufficiently distributed over time and space. Nawiliwili and Huleia, listed in 2002 for turbidity, had a sufficient number of sites; however, sampling was not representative of both wet and dry season conditions. All these streams are listed except Papakolea. These stream systems should be scheduled for future monitoring (see APPENDIX C). Several attempts were made to determine the exact dates of sampling represented by this report, but HIDOH was unable to get this data by the publication date of this report. TABLE 3 summarizes the results of the biological assessments.

The Kaneohe and Waikele Stream bioassessments were conducted by HIDOH as part of the TMDL studies for these streams.

TABLE 3: Summary of Biological Assessments

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Stream System Number*	Stream System	Number of Sites	Includes Upper Site (Y/N)	Includes Lower Site (Y/N)	Conducted in Wet Season (W), Dry Season (D) or Both (B)	Overall Biotic Integrity Rating	Overall Habitat Rating**
2-2-13	Nawiliwili	2	Y	Y	Unclear	Impaired	Impaired
2-2-15	Huleia	2	Y	Y	Unclear	Impaired	Poor
2-2-14	Puali	1	Unclear	Y	Unclear	Impaired	Very Poor
2-2-15	Papakolea	1	Unclear	Unclear	Unclear	Impaired	Impaired
3-2-10	Kaneohe	3	Y	Y	Both	Impaired	Impaired
3-4-10	Waikele	5	Y	Y	Both	Impaired	Very Poor

* These codes denote stream location and were adopted from the Hawaii Stream Assessment (COWRM and NPS 1990). The first number in each code represents the island (2=Kauai, 3=Oahu, 4=Molokai, 6=Maui and 8=Hawaii).
***0-40% of Reference Conditions=Impaired, 40-60%=Very Poor, 60-70%=Poor, 70-80% = Fair, 80-90%=Good, 90-100%=Very Good*

4. Other Environmental Assessments and Investigations

There were no environmental assessments or investigations that pertained to surface waters available for this report.

5. Other Data Sources

West Maui - Lahaina and Kihei coastal areas

Sufficient QA/QC procedures for Priority 2a listing were presented by Dr. Edward A. Laws in his Report to DOH, Coastal Water Quality in West Maui-Lahaina and Kihei. The sites generally correspond with areas surveyed by the Clean Water Branch, however, these sites were added to the listing as separate stations because the samples were gathered by different personnel, utilizing protocols and analytical equipment that was deemed different enough to warrant being treated as separate events.

TABLE 4a: Summary of West Maui and Kihei Coasts Data

West Maui sites	Turb. (NTU)	SS (mg/L)	TDP mg/l)	(NO3 (mg/l)	NH4 (mg/l)	TDN (mg/l)	chl a (mg/L)
Hanakaoo	E	NE	NE	E	NE	NE	NE
Honokeana Cove	E	NE	NE	E	NE	E	E
Kahana Cove	E	NE	NE	E	NE	E	E
Kahana Sunset	E	NE	NE	E	NE	NE	E
Kahana Village	E	NE	NE	NE	NE	NE	E
Kaopala Bay	E	NE	NE	E	E	E	E
Lokelani	E	NE	NE	E	NE	NE	E
Mala	E	NE	NE	NE	NE	NE	E
Napili Bay	E	NE	NE	E	NE	NE	E
Papakea	E	NE	NE	NE	NE	NE	E
Puamana	E	NE	NE	NE	NE	NE	E
S-Turns	E	NE	NE	E	NE	E	E
Maalaea sites							
Cove Park	E	NE	NE	E	NE	E	E
Kalama Park	E	NE	NE	E	E	E	E
Kalepolepo	E	NE	NE	E	NE	E	E
Kaunoulu	E	NE	NE	E	NE	E	E
Kealia Pond	NE	NE	NE	NE	NE	NE	E
Keawakapu	NE	NE	NE	E	NE	NE	E
Kihei Boat Ramp	E	NE	NE	E	NE	E	NE
Kalanihakoi	E	NE	NE	E	E	E	E
Luana Kai	E	NE	NE	E	E	E	E
Ma'alaea harbor	E	NE	NE	E	NE	E	E
Maui Coast	E	NE	NE	E	NE	NE	E
Mokulele	E	NE	NE	E	NE	E	E
SOUTH KAM II	NE	NE	NE	E	NE	NE	E
South Lipoa	E	NE	NE	NE	NE	NE	E

E – exceedance of standard NE – no exceedance of standard

Hanalei Watershed area

The Hanalei Watershed Hui presented sufficient QA/QC procedures. The data were analyzed for this report. The sites generally correspond with areas surveyed by the Clean Water Branch; however, these sites were added to the listing as separate stations. The rationale behind keeping the samples as separate entries is that completely different groups gather the samples with different personnel, equipment, protocols, and analytical methods.

TABLE 4b: Summary of Hanalei, Kauai Data

Kauai – Hanalei Area	Enterococci (col/100ml)	Turbidity (NTU)
Hanalei River at Weke Road	N/A	E
Hanalei River at Dolphin	N/A	E
Hanalei Landing	N/A	E
Hanalei Pavilion	E	*
Hanalei Pinetrees	E	*
Mooring	E	*
Waioli Estuary	N/A	E
Waipa Estuary	N/A	E
Waikoko Estuary	N/A	E
Hanalei River at Cutoff	N/A	NE

E – exceedance of standard NE – no exceedance of standard
N/A – no appropriate data for standard - fecal coliforms are the standard for fresh and brackish waters > 0.5 ppt salinity
* - no turbidity data provided for these sites

Heeia and Haiku Streams

Sufficient data and QA/QC procedures were available for listing/delisting decisions. The data represented seven sampling events in the wet season. The data agree with those collected by the Clean Water Branch of HIDOH.

TABLE 4c: Summary of Heeia and Haiku, Oahu Data

Sampling Site	**Total Nitrogen**	**Nitrate/ Nitrite**	**Total Phosphorus**
Haiku	NE	E	NE
Subdivision	E	2E	NE
Marsh	NE	NE	NE
Restoration	NE	E	NE
Stream Mouth	NE	2E	NE
Kaneohe Bay <reef	NE	2E	NE
Kaneohe Bay >reef	NE	2E	NE
Kaneohe Bay – deep water	NE	E	NE

NE – No exceedance, E- exceedance, 2E – exceeds WQS by a factor of 2.

HAWAII'S 2004 303(d) LIST

The 2004 303(d) List includes the waterbodies on the revised 2002 List of Impaired Waterbodies plus an additional forty-six new waterbodies: eleven streams and thirty-five coastal waters. Station numbers and names are based on the Hawaii Stream Assessment (CWRM and NPS 1990). Waterbodies were prioritized as High, Medium or Low for Total Maximum Daily Load (TMDL) development. High, medium or low priorities were assigned to each water based on number of parameters listed and severity of exceedances.

TMDL Priorities:

TMDLs have been established for the Ala Wai Canal (revised 2002), Waimanalo Stream (approved 2001) and Kawa Stream (approved 2002). TMDLs for Kamooalii, Kaneohe, Waikele and Kapaa streams (Oahu) and Nawiliwili, Puali, and Huleia Streams (Kauai) are scheduled for completion in 2004. HIDOH contractors are developing TMDLs for listed waterbodies in Oahu's Pearl Harbor Watershed (Kapakahi, Waiawa, Waimano, Waimalu, Aiea, Kalauao, and Halawa streams), with completion expected in 2005.

HIDOH contractors are also developing TMDLs for Oahu's Kaiaka Bay Watershed - Kiikii Stream system (upper Kaukonahua Stream), with completion expected in 2005, and Wahiawa Reservoir, phased TMDL. On the island of Hawaii, the Hilo Bay Watershed TMDLs for Waiakea and Alenaio Streams are expected to be completed in 2005. EPA contractors are developing TMDLs for the Hanalei River and estuary; TMDL Reports are expected to be completed in 2005.

In each case, TMDLs will be established for pollution by sediment, nutrients, and bacterial indicators. Other detected pollutants in these waterbodies (e.g. trash in Kapakahi; metals in Kapaa; and pathogens, metals, organochlorine pesticides and lead in the Ala Wai Canal) are not currently scheduled for TMDL development. Depending on the availability of funding and community partnerships, HIDOH will begin developing TMDLs for the Kaelepulu Stream System (stream and estuary segments) in 2004 and for other priority waterbodies in subsequent years.

The 2004 List appears in TABLE 5; all changes to the 2002 list are shaded throughout the 2004 List. Waters previously listed on the basis of old data or visual assessment will remain on the list until there are sufficient data to justify delisting. Factors considered for prioritizing waters on the 303(d) list as High (H), Medium (M) or Low (L) include the following:

* severity of pollution (number of pollutants listed and degree that levels of pollutants exceed the standard),
* uses of the waters,
* type and location of waterbody,
* degree of public interest and
* vulnerability of particular waters,

TABLE 5: 2004 303(d) List for Hawaii

- Newly listed waters are highlighted in the table, as are any changes to the parameters for previously listed waters.
- The "Standard" column explains whether waters listed based on numeric assessments were found to violate numeric water quality standards under wet and/or dry conditions. Estuaries do not have separate wet/dry standards and thus state "overall" values.
- For the purposes of this report, listed waterbodies were sorted by island, then into the streams category (salinity chronically below 0.5 ppt) or the coastal category (above 0.5 ppt). The waterbodies were then sorted alphabetically.

HAWAII

STREAMS						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Aamakao Stream	Aamakao Stream	turbidity	numeric assessment	8-1-12	dry	L
Alenaio Stream	Alenaio Stream (Wailoa tributary)	nutrients	visual assessment	8-2-61.01.1		(TMDL in process)
Hakalau Stream	Hakalau Stream	nutrients turbidity	visual assessment	8-2-32		M
Honolii Stream	Honolii Stream	nutrients turbidity	visual assessment	8-2-56	dry dry	M
Kaieie Stream	Kaieie Stream	nutrients	visual assessment	8-2-49		M
Kapeha Stream	Kapeha Stream	turbidity	numeric assessment	8-2-37	dry	L
Kolekole Stream	Kolekole Stream	nutrients ~~turbidity~~	visual assessment numeric assessment	8-2-33	dry ~~wet, dry~~	M
Lalakea Stream	Lalakea Stream	turbidity	numeric assessment	8-1-45	dry	L
Niulii Stream	Niulii Stream	turbidity	numeric assessment	8-1-13	dry	L
Waiakea Stream	Waiakea Stream (Wailoa tributary)	nutrients	visual assessment	8-2-61		(TMDL in process)
Waikama Stream	Waikama Stream	turbidity	numeric assessment	8-1-14	~~wet~~, dry	L
Wailoa ~~Stream~~ River	Wailoa ~~Stream~~ River	nutrients turbidity	visual assessment	8-2-61		M

HAWAII (continued)

STREAMS						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Wailoa/Waipio Stream	Wailoa/Waipio Stream	nitrite/nitrate	numeric assessment	8-1-44	dry	L
Wailuku Stream	Wailuku Stream	nutrients	visual assessment	8-2-60	~~wet~~, dry	L
Wainaia Stream	Wainaia Stream	turbidity	numeric assessment	8-1-09	wet	L

COASTAL						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Hapuna Beach	Hapuna Beach station	chlorophyll a turbidity	numeric assessment	001200	wet wet	L
Hilo Bay	Bay inshore of Breakwater and near shore waters from Wainaku to Paukaa	nutrients turbidity	visual assessment, prior listing			M
Hilo Bay	Boat Landing station	chlorophyll a	numeric assessment	001106	wet/dry	M
Hilo Bay	Canoe Beach station	enterococci turbidity	numeric assessment	001138	wet wet/dry	M
Hilo Bay	Exit of Ice Pond station	Total P enterococci	numeric assessment	001102	wet/dry wet	M
Hilo Bay	Lighthouse station	chlorophyll a turbidity enterococci	numeric assessment	001107	wet/dry wet wet	M
Hilo Bay	Offshore station	chlorophyll a turbidity nitrite/nitrate ammonium	numeric assessment	001141	wet/dry dry wet/dry wet/dry	M
Hilo Bay	Honolii Cove station	enterococci turbidity	numeric assessment	001110	wet/dry wet/dry	M

HAWAII (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Leleiwi Beach Park	Leleiwi Beach Park station	Total P enterococci	numeric assessment	001121	Dry wet/dry	M
Kailua Bay	Kailua Pier A-1 station	Total P	numeric assessment	001205	wet	L
Kawaihae Harbor/ Pelekane Bay	Kawaihae Harbor/ Pelekane Bay	turbidity				L
Kawaihae Harbor/ Pelekane Bay	Spencer Park Beach station	turbidity chlorophyll a	numeric assessment	001225	wet wet	L
Kealakekua Bay	Kealakekua Bay - off curio stand station	turbidity	numeric assessment	001211	dry	L
Kolekole Beach	Kolekole Gulch station	enterococci turbidity	numeric assessment	001118	wet/dry wet/dry	L
Magic Sands Beach	Magic Sands Beach station	chlorophyll a turbidity	numeric assessment	001215	wet/dry dry	L
Pacific Ocean	Vacationland Station	turbidity	numeric assessment	1142	dry	L
Pualaa Beach Park	Pualaa Beach Park station	enterococci	numeric assessment	001143	dry	L
Puhi Bay	Puhi Bay #3 station	turbidity chlorophyll a	numeric assessment	001130	dry wet/dry	L
Richardson Ocean Center	Richardson Ocean Center station	chlorophyll a turbidity	numeric assessment	001136	wet/dry dry	L
Wailoa River	Wailoa River Boat Ramp station	enterococci	numeric assessment	001132	wet/dry	M

KAUAI

STREAMS						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Hanalei River	Hanalei River	turbidity	visual assessment	2-1-19	dry	(TMDL in process)
Hanamaulu Stream	Hanamaulu Stream	turbidity	~~visual assessment~~ numeric assessment	2-2-12	wet	M
Hanapepe River	Hanapepe River	turbidity	visual assessment numeric assessment	2-3-07	wet dry	M
Huleia Stream	Huleia Stream	turbidity nitrite/nitrate	visual assessment numeric assessment	2-2-15	dry wet	(TMDL in process)
Kapaa Stream	Kapaa Stream	turbidity	visual assessment numeric assessment	2-2-04	dry wet	M
Kilauea Stream	Kilauea Stream	turbidity	numeric assessment	2-1-28	wet	L
Lawai Stream	Lawai Stream	turbidity nitrite/nitrate	numeric assessment numeric assessment	2-3-04	wet dry	M
Nawiliwili Stream	Nawiliwili Stream	turbidity turbidity nitrite/nitrate Total N	visual assessment numeric assessment numeric assessment numeric assessment	2-2-13	dry wet wet wet	(TMDL in process)
Puali Stream	Puali Stream	nitrite/nitrate	numeric assessment	2-2-14	wet	(TMDL in process)
Uhelekawawa Stream	Uhelekawawa Stream	turbidity	visual assessment			M
Waimea River	Waimea River	turbidity	visual assessment	2-4-04s		M

KAUAI (continued)

COASTAL						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Anini Beach	Anini Park Pavilion Station	turbidity	numeric assessment	000801	dry	L
Hanalei Bay	Hanalei Bay Landing station	enterococci turbidity	numeric assessment numeric assessment	000804	wet/dry	H
Hanalei Bay	Hanalei Bay Landing station	turbidity	numeric assessment			H
Hanalei Bay	Hanalei Bay Mooring station	enterococci	numeric assessment			H
Hanalei Bay	Hanalei Bay at Pavilion station	enterococci	numeric assessment			H
Hanalei Bay	Hanalei Bay at Pinetrees station	enterococci	numeric assessment			H
Hanalei River Estuary	Hanalei River upstream of Dolphin	turbidity	numeric assessment			(TMDL in progress)
Hanalei River Estuary	Hanalei River (Weke Rd) station	enterococci turbidity	numeric assessment	000839	wet/dry	(TMDL in process)
Hanalei River Estuary	Hanalei River (Weke Rd) station	turbidity	numeric assessment			See above
Hanamaulu Bay	Hanamaulu Bay	turbidity	visual assessment			L
Hanamaulu Bay	Hanamaulu Beach (middle) station	enterococci	numeric assessment	000806	wet/dry	L
Hanapepe Bay	Bay from breakwater to shore and nearshore waters to 30' from Puolo Point to Paakehi Point	nutrients	visual assessment, prior listing			L
Hanapepe Bay	Port Allen Pier station	Total N turbidity chlorophyll a	numeric assessment	000821	wet/dry dry wet/dry	L
Kalihiwai Bay Beach	Kalihiwai Bay Beach station	enterococci	numeric assessment	000811	wet	L
Koloa Landing	Koloa Landing station	enterococci	numeric assessment	000837	wet	L
Waikoko Stream Estuary	Waikoko Stream Estuary	turbidity	numeric assessment			H
Waioli Stream Estuary	Waioli Stream Estuary	turbidity	numeric assessment			M
Waipa Stream Estuary	Waipa Stream Estuary	turbidity	numeric assessment			H

KAUAI (continued)

COASTAL (continuted)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Nawiliwili Bay	Bay from breakwater to shore	turbidity nutrients	visual assessment, prior listing			H
Nawiliwili Bay	Nawiliwili Harbor- Coast Guard Pier station	enterococci	numeric assessment	000817	wet	H
Nawiliwili Bay	Kalapaki Beach (middle) station	enterococci	numeric assessment	000809	wet	H
Nawiliwili Bay	Nawiliwili Bay offshore embayment station	nitrite/nitrate ammonium turbidity chlorophyll a	numeric assessment	000881	wet/dry wet/dry dry wet/dry	H
Wailua River	Wailua River station	enterococci	numeric assessment	000822	wet/dry	M
Waimea Bay	Nearshore waters to 18' from Kekaha Oomano Pt. to point 1.5 miles southeast of Mahinaui Stream	suspd. solids turbidity	visual assessment, prior listing			M
Waimea Bay	Waimea Bay Beach (near River) station	enterococci	numeric assessment	000823	wet/dry	M

MAUI

STREAMS						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Honokowai Stream	Honokowai Stream	turbidity	visual assessment	6-1-07		M
Iao Stream	Iao Stream	turbidity trash	visual assessment	6-2-09		H
Kahana Stream	Kahana Stream	turbidity	visual assessment	6-1-08		M
Kahoma Stream	Kahoma Stream	turbidity	visual assessment	6-1-05		M
Makamakaole Stream	Makamakaole Stream	turbidity	numeric assessment	6-2-06	dry	L
Maliko Stream	Maliko Stream	turbidity	numeric assessment	6-3-01	wet	L
Ohia Stream	Ohia Stream	nutrients turbidity trash	visual assessment	6-4-12		M
Ukumehame Stream	Ukumehame Stream	turbidity	numeric assessment	6-1-01	dry	L
Waihee Stream	Lower Waihee Stream	nutrients	visual assessment	6-2-07		M
Waipio Stream	Waipio Stream	turbidity	numeric assessment	6-3-10	wet	L

COASTAL						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Baldwin Beach Park	H.A. Baldwin Park Station	turbidity	numeric assessment	000689	wet/dry	L
Hanakaoo Beach Park	Hanakaoo Beach Station	turbidity nitrite/nitrate	numeric assessment	000693	wet/dry	L
Hanakaoo	Hanakaoo Station	turbidity nitrite/nitrate	numeric assessment			L
Honomanu Bay	Honomanu Bay station	enterococci	numeric assessment	000653	wet/dry	L
Hookipa Beach Park	Hookipa Station	turbidity	numeric assessment	000688	dry	L
Kahekili Beach Park	Airport (Kahekili) Beach Station	turbidity	numeric assessment	000695	wet/dry	L
Kahului Bay	Bay inshore of breakwater	nutrients turbidity	visual assessment, prior listing			L

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kahului Bay	Hukilau Hotel Station	turbidity	numeric assessment	000654	wet/dry	L
Kahului Bay	Kahului Bay station	turbidity chlorophyll a Total N nitrite/nitrate ammonium	numeric assessment	000680	wet/dry wet/dry wet wet/dry wet/dry	L
Kihei Coast	Kalepolepo	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			L
Kanaha Beach	Kaa Shoreline station	Total P turbidity chlorophyll a	numeric assessment	000655	dry wet/dry wet/dry	L
Kanaha Beach	Kanaha Beach Park station	Total P turbidity chlorophyll a	numeric assessment	000677	dry wet/dry wet/dry	L
Kaunoulu Estuary	Kaunoulu Estuary	turbidity nitrIte/nitrate Total N chlorophyll a	numeric assessment			L
Kealia Pond	Kealia Pond	chlorophyll a	numeric assessment			H
Kihei Coast	Kihei Coast - Estuary Boat Ramp	turbidity nitrite/nitrate Total N	numeric assessment			L
Kihei Coast	Cove Park	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			L

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kihei Coast (formerly listed as West Maui, Kihei or South)	Nearshore waters to 60' from Kihei North - Kalama Beach	nutrients turbidity suspd. solids	visual assessment, prior listing			M
Kihei Coast	Kalama Beach station	turbidity nitrite/nitrate ammonium Total N chlorophyll a	numeric assessment	000679	dry wet/dry wet/dry	M
Kihei Coast	Kalama Beach station	turbidity nitrite/nitrate ammonium Total N chlorophyll a	numeric assessment			M
Kihei Coast	Kamaole Beach #1 station	chlorophyll a turbidity	numeric assessment	000681	wet/dry wet/dry	M
Kihei Coast	Kamaole Beach #2 station	turbidity chlorophyll a	numeric assessment	000682	wet/dry wet/dry	M
Kihei Coast	South Kam II	nitrite/nitrate chlorophyll a	numeric assessment			M
Kihei Coast	Kamaole Beach #3 station	chlorophyll a turbidity	numeric assessment	000683	wet/dry wet/dry	M
Kihei Coast	Keawekapu Beach station	turbidity chlorophyll a	numeric assessment	000685	wet*/dry wet/dry	M
Kihei Coast	Keawakapu	nitrite/nitrate chlorophyll a	numeric assessment			M
Kihei Coast	Kihei North station	chlorophyll a turbidity Total P	numeric assessment	000671	wet/dry wet dry	M

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kihei Coast	Kihei South station	Total P chlorophyll a turbidity	numeric assessment	000676	wet/dry wet/dry wet/dry	M
Kihei Coast	Lipoa – South	turbidity chlorophyll a	numeric assessment			M
Kihei Coast	Ulua Beach station	chlorophyll a turbidity	numeric assessment	000686	wet/dry* wet/dry*	M
Launiupoko Wayside Park	Launiupoko Wayside Park Station	turbidity	numeric assessment	000694	wet/dry	L
Kihei Coast	Luana Kai	turbidity nitrite/nitrate ammonium Total N chlorophyll a	numeric assessment			M
Kihei Coast	Kihei Coast - Maui Coast	turbidity nitrite/nitrate chlorophyll a	numeric assessment			M
Kihei Coast	Kihei Coast Mokulele	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			M
Kihei Coast	Kulanihakoi	turbidity nitrite/nitrate ammonium Total N chlorophyll a	numeric assessment			M
Maalaea Bay and Harbor	Maalaea Condo station	chlorophyll a turbidity	numeric assessment	000687	wet/dry wet/dry	L
Maalaea Bay and Harbor	Maalaea Small Boat Harbor station	turbidity chlorophyll a	numeric assessment	000659	dry dry	L

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Maalaea Harbor	Maalaea Boat Harbor station	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			L
Mai Ponia Oe Iau Park	Mai Ponia Oe Iau Station	turbidity	numeric assessment	000702	dry	L
Makena Beach	Makena Beach station	chlorophyll a turbidity	numeric assessment	000661	dry dry/wet	L
Olowalu Beach	Teen Challenge (MI 14) Station	turbidity	numeric assessment	000697	dry	L
Paia Bay	Paia Outfall Station	turbidity	numeric assessment	000664	wet/dry	L
Puunoa Point	Puunoa (Baby) Beach Station	turbidity	numeric assessment	000696	dry	L
Spreckelsville Beach	Spreckelsville Beach Station	turbidity	numeric assessment	000700	wet/dry	L
Ukumehame Beach	Ukumehame Beach station	enterococci	numeric assessment	000698	wet	L
Wailea Beach	Wailea Beach Station	turbidity	numeric assessment	000691	wet/dry	L
West Maui Coast	Hanakeana Cove – West Maui Coast	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			M
West Maui Coast	Kahana Cove – West Maui Coast	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			M
West Maui Coast	Kahana Sunset – West Maui Coast	turbidity nitrite/nitrate chlorophyll a	numeric assessment			M
West Maui Coast	Kahana Village – West Maui Coast	turbidity chlorophyll a	numeric assessment			M

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
West Maui Coast	Kaopala Bay – West Maui Coast	turbidity nitrIte/nitrate ammonium Total N chlorophyll a	numeric assessment			M
West Maui Coast- North	Nearshore waters to 60' from Honolua - Lahaina	nutrients turbidity,TSS	visual assessment, prior listing			M
West Maui Coast- North	Olowalu Shore Front station	chlorophyll a turbidity	numeric assessment	000663	dry wet/dry	M
West Maui Coast	Lokelani – West Maui Coast	turbidity nitrite/nitrate chlorophyll a	numeric assessment			M
West Maui Coast- North	Lahaina Small Boat Harbor station	turbidity	numeric assessment	000657	dry	M
West Maui Coast	Mala Warf – West Maui Coast	turbidity chlorophyll a	numeric assessment			L
West Maui Coast	Napili Bay – West Maui Coast	turbidity nitrite/nitrate chlorophyll a	numeric assessment			L
West Maui Coast- North	Mala Wharf station	enterococci Total P turbidity chlorophyll a	numeric assessment	000662	wet wet/dry wet/dry wet/dry	M
West Maui Coast- North	Waihikuli Beach station	chlorophyll a turbidity	numeric assessment	000678	wet/dry wet/dry	M
West Maui Coast- North	Sheraton Kaanapali Shoreline station	chlorophyll a turbidity	numeric assessment	000666	wet/dry wet/dry	M
West Maui Coast- North	Hale Onoloa Condominium Shore station	chlorophyll a turbidity Total P	numeric assessment	000651	wet/dry wet/dry dry	M

MAUI (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
West Maui Coast- North	Mahinahina Condo Shoreline station	turbidity chlorophyll a Total P	numeric assessment	000660	wet/dry wet/dry dry	M
West Maui Coast- North	Fleming Beach station	turbidity chlorophyll a	numeric assessment	000650	wet/dry wet/dry	M
West Maui Coast	S-Turns (Pohaku) – West Maui Coast	turbidity nitrite/nitrate Total N chlorophyll a	numeric assessment			M
West Maui Coast	Papakea – West Maui Coast	turbidity chlorophyll a	numeric assessment			M
West Maui Coast	Puamana – West Maui Coast	turbidity chlorophyll a	numeric assessment			M
West Maui Coast- North	Fleming Beach North station	Turbidity chlorophyll a	numeric assessment	000674	wet/dry wet/dry	M

MOLOKAI

COASTAL						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kawaaloa and Moomomi Bays	Kawaaloa and Moomomi Bays	turbidity	visual assessment			L
South Molokai Coast	Nearshore waters to 18' from southwest point - Waialua	nutrients turbidity suspd. solids	prior listing			M

OAHU

STREAMS						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Aiea Stream	Aiea Stream	turbidity trash	visual assessment	3-4-03		(TMDL in process)
Anahulu Stream	Anahulu Stream	nutrients turbidity	visual assessment	3-6-08s		M
Halawa Stream	Halawa Stream	nutrients turbidity	visual assessment	3-4-02		(TMDL in process)
Heeia Stream	Heeia Stream	nitrite/nitrate	numeric assessment	3-2-08	wet	M
Kaaawa Stream	Kaaawa Stream	nutrients turbidity	visual assessment	3-1-19		M
Kaalaea Stream	Kaalaea Stream	nitrite/nitrate Total N	numeric assessment numeric assessment	3-2-05	wet/dry wet/dry	M
Kaelepulu Stream	Kaelepulu Stream/Enchanted Lakes	nutrients turbidity	visual assessment	3-2-14		H
Kahaluu Stream	Kahaluu Stream	~~nutrients~~ turbidity	visual assessment	3-2-07s	wet	M
Kahawainui Stream	Kahawainui Stream	nutrients turbidity	visual assessment	3-1-07		M
Kalauao Stream	Kalauao Stream	nitrite/nitrate Total N	numeric assessment numeric assessment	3-4-04	wet wet	(TMDL in process)
Kalihi Stream	Kalihi Stream	~~nutrients~~ nitrite/nitrate Total N turbidity trash	~~visual~~ numeric assessment numeric assessment numeric assessment narrative	3-3-11	wet/dry wet dry	~~M~~ H
Kamooalii Stream (Tributary to Kaneohe Stream)	Kamooalii Stream	nutrients turbidity	visual assessment numeric assessment	3-2-10.01	dry	(TMDL in process)

OAHU (continued)

STREAMS (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kaneohe Stream	Kaneohe Stream	nutrients turbidity dieldrin	visual assessment ~~visual~~ numeric assessment narrative assessment	3-2-10	wet	(TMDL in process)
Kapaa Stream	Kapaa Stream/Kawainui Marsh/Kawainui Stream	nutrients turbidity suspd. solids metals	visual assessment	~~2-2-04~~ 3-2-13s		(TMDL in process)
Kapakahi Stream	Kapakahi Stream	~~nutrients~~ turbidity nitrite/nitrate Total N Total P trash	visual assessment numeric assessment numeric assessment numeric assessment		wet wet wet	(TMDL in process)
Kapalama Stream	Kapalama Stream	nutrients turbidity trash	Visual assessment	3-3-10		M
Kaupuni Stream	Kaupuni Stream	nutrients turbidity trash	visual assessment	3-5-05		M
Kawa Stream	Kawa Stream	nutrients turbidity suspd. solids	visual assessment	3-2-11		(TMDLs approved in 2002)

OAHU (continued)

STREAMS (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Keaahala Stream	Keaahala Stream	~~nutrients~~ nitrite/nitrate Total N Total P turbidity trash	~~visual~~ numeric assessment numeric assessment numeric assessment numeric assessment visual assessment	3-2-09	 wet, dry wet, dry dry dry	~~M~~ H
Kiikii Stream	Kiikii Stream	nutrients turbidity	visual assessment	3-6-06s		(TMDL segment in process)
Makiki Stream	Makiki Stream (Jack in the Box) station	Total P nitrogen	numeric assessment	ALWS06	dry dry	M
Manoa Stream	Manoa Stream	nutrients turbidity dieldrin total chlordane	visual assessment visual assessment narr.&num. assmt. assessment	~~2-1-13~~ 3-3-07.01		M
Maunawili Stream	Maunawili Stream (Kawainui Marsh tributary)	nutrients turbidity trash	visual assessment	3-2-13		M
Moanalua Stream	Moanalua Stream	nutrients turbidity,trash	visual assessment	3-3-12		M
Nuuanu Stream	Nuuanu Stream	~~nutrients~~ trash nitrite/nitrate Total N turbidity dieldrin total chlordane	~~visual assessment~~ visual assessment numeric assessment numeric assessment narrative assessment	3-3-09	 wet, wet, dry wet, dry	H

OAHU (continued)

STREAMS (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Palolo Stream	Palolo Stream	trash	visual assessment	3-3-07s		M
Paukauila Stream	Paukauila Stream	nutrients turbidity	visual assessment	3-6-07s		M
Waiahole Stream	Waiahole Stream	nitrite/nitrate	numeric assessment	3-2-04	wet	M
Waiawa Stream	Waiawa Stream	nutrients turbidity trash	visual assessment	3-4-06		(TMDLs in process)
Waihee Stream	Waihee Stream	nutrients	visual assessment	~~6-2-07~~ 3-2-07.01		M
Waikele Stream	Waikele Stream	nutrients turbidity	~~visual~~ numeric assessment	3-4-10		(TMDLs in process)
Waimalu Stream	Waimalu Stream	turbidity	~~visual~~ numeric assessment	3-4-05	wet	(TMDLs in process)
Waimanalo Stream	Waimanalo Stream	nutrients turbidity suspd. solids	visual assessment	3-2-15		(TMDLs approved 2001)
Waimano Stream (Tributary to Waiawa)	Waimano Stream	turbidity	visual assessment			(TMDLs in process)

OAHU (continued)

COASTAL						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Ala Wai Canal and Harbor	Ala Wai Canal and Boat Harbor	nutrients pathogens metals turbidity suspd. solids organochlorine pesticides lead	visual assessment, prior listing fish consumption advisory			TMDL completed for nutrients M - others
Ala Wai Canal and Harbor	Ala Wai Canal (Diamond Head end) station	enterococci turbidity Total N Total P chlorophyll a	numeric assessment	ALWS01	wet/dry overall overall	L
Ala Wai Canal and Harbor	Ala Moana Bridge station	enterococci nitrogen turbidity Total P chlorophyll a	numeric assessment	000320	wet/dry overall overall overall overall	L
Manoa Stream	Manoa Stream Fork station	turbidity nitrogen fecal coliform	numeric assessment	ALWS03	overall overall wet	M
Ala Wai Canal and Harbor	Manoa-Palolo Stream mouth station	chlorophyll a nitrogen Total P turbidity	numeric assessment	ALWS05	overall overall overall overall	L
Ala Wai Canal and Harbor	Manoa-Palolo Stream (KHS) station	fecal coliform nitrogen Total P turbidity chlorophyll a	numeric assessment	ALWS04	Wet overall overall overall overall	M

OAHU (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Ala Wai Canal and Harbor	Palolo Stream Fork station	nitrogen turbidity fecal coliform	numeric assessment	ALWS02	overall overall wet	M
Ala Wai Canal and Harbor	McCully St. Bridge station	enterococci	numeric assessment	000321	wet/dry	L
Ewa Beach Park	Ewa Beach Park station	Total P Total N chlorophyll a turbidity	numeric assessment	000189	dry wet/dry wet/dry wet/dry	L
Gray's Beach	Gray's Beach station [Halekulani]	Total N turbidity chlorophyll a	numeric assessment	000159	wet/dry wet/dry wet/dry	L
Hanauma Bay	Hanauma Bay	trash	visual assessment			L
Hanauma Bay	Hanauma Bay (oceanic) station	chlorophyll a nitrite-nitrate ammonium	numeric assessment	000444	dry dry dry	L
Hanauma Bay	Hanauma Bay station	turbidity Total N chlorophyll a	numeric assessment	000201	wet/dry wet/dry dry	L
Hawaii Kai	Hawaii Kai station	enterococci	numeric assessment	000229	wet	L
Honolulu Harbor and Shore Areas	Nearshore waters to 30' from 1 mile northwest of Honolulu Harbor/Sand Island channel to Waikiki Beach	nutrients pathogens metals turbidity suspd. solids	prior listing			L
Honolulu Harbor and Shore Areas	Ala Moana Park (Diamond Head end) station	enterococci	numeric assessment	000154	wet	L
Honolulu Harbor and Shore Areas	Ala Moana Park Center station	Total N turbidity chlorophyll a	numeric assessment	000153	wet/dry wet/dry wet/dry	L

OAHU (continued

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Honolulu Harbor and Shore Areas	Kewalo Basin	nutrients suspd. solids turbidity trash	visual assessment, prior listing			L
Honolulu Harbor and Shore Areas	Kewalo Basin station	Total N Total P turbidity chlorophyll a	numeric assessment	000361	dry dry dry dry	L
Honolulu Harbor and Shore Areas	Honolulu Waterfront-Aloha Tower	turbidity trash	visual assessment			L
Honolulu Harbor and Shore Areas	Sand Island Point #2	turbidity Total N chlorophyll a	numeric assessment	000165	dry dry dry	L
Honolulu Harbor and Shore Areas	Sand Island Point #3	turbidity Total N chlorophyll a	numeric assessment	000165	dry dry dry	L
Lanikai Beach	Lanikai Beach station	enterococci	numeric assessment	000194	wet*	L
Kaelepulu Stream	Kaelepulu Stream station	enterococci Total N Total P turbidity chlorophyll a	numeric assessment	000302	wet/dry wet/dry wet/dry wet/dry wet/dry	M
Kahana Bay	Nearshore waters to 30' from Mahie Point to a point one mile north of Kahana Bay station	suspd. solids turbidity	visual assessment, prior listing			L
Kahana Bay	Kahana Park (1) station	Total N enterococci turbidity Total P	numeric assessment	000178	wet/dry wet/dry wet/dry wet/dry	L

OAHU (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kahanamoku Lagoon-Diamond Head	Kahanamoku Lagoon- Diamond Head station	enterococci	numeric assessment	000157	wet	L
Kailua Beach	Kailua Beach Park station	enterococci Total N chlorophyll a Total P turbidity	numeric assessment	000193	wet wet/dry wet/dry wet/dry wet/dry	L
Kailua Beach	Oneawa Beach station	chlorophyll a Total P Total N turbidity	numeric assessment	000304	wet/dry wet wet/dry wet/dry	L
Kaiona Beach	Kaiona Beach station	enterococci	numeric assessment	000227	wet	L
Kaneohe Bay	Nearshore waters at mouths of Kaneohe and Kawa streams	nutrients turbidity suspd. solids	prior listing			H
Kaneohe Bay	Kaneohe Bay (Central Region) station	total Total N nitrate-nitrite ammonium turbidity chlorophyll a	numeric assessment	000403	dry wet/dry wet/dry wet/dry wet/dry	L
Kaneohe Bay	Kaneohe Bay (Northern Region) station	total Total N nitrate-nitrite ammonium turbidity chlorophyll a	numeric assessment	000402	dry wet/dry wet/dry wet/dry wetdry	L
Kaneohe Bay	Kaneohe Bay (Southern Region) station	chlorophyll a turbidity total Total N nitrate-nitrite ammonium enterococci	numeric assessment	000401	wet/dry wet/dry dry wet/dry wet/dry wet	L

OAHU (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Kaneohe Bay	Kokokahi Pier	enterococci Total N chlorophyll a turbidity Total P	numeric assessment	000191	wet wet/dry wet/dry wet/dry dry	L
Kaneohe Bay	Kaneohe Beach Park station	Total N turbidity chlorophyll a Total P	numeric assessment	000190	wet/dry wet/dry wet/dry wet/dry	L
Kaneohe Bay	Heeia Kea Small Boat Harbor station	enterococci Total N chlorophyll a	numeric assessment	000362	wet wet/dry wet/dry	L
Kawela Bay	Kawela Bay station	Total N chlorophyll a Total P turbidity enterococci	numeric assessment	000173	wet/dry wet/dry wet/dry wet/dry wet	L
Keehi Lagoon	Keehi Lagoon waters and nearshore waters to 30' from lagoon mouth to Pearl Harbor	nutrients turbidity suspd. solids	prior listing			L
Keehi Lagoon	Keehi Lagoon Point X	enterococci Total N chlorophyll a Total P	numeric assessment	000342	wet/dry wet/dry wet/dry wet/dry	L
Kualoa Beach	Kualoa Beach Park Station	enterococci	numeric assessment	000208	wet	L
Kuhio Beach	Kuhio Beach station	enterococci	numeric assessment	00161	wet	L
Laie Bay	Laie Bay station	chlorophyll a Total N Total P turbidity	numeric assessment	000175	wet/dry wet/dry wet/dry wet/dry	L

OAHU (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Makaha Beach	Makaha station	Total N chlorophyll a turbidity	numeric assessment	000185	wet/dry wet/dry wet	L
Mamala Bay	Mamala Bay (oceanic) station	Total N chlorophyll a	numeric assessment	000442	wet/dry wet/dry	L
Mamala Bay	Mamala Bay (Sand Island offshore) station	Total N chlorophyll a enterococci	numeric assessment	000441	wet/dry wet/dry wet	L
Maunalua Bay	Maunalua Bay (open coastal) station	total Total N nitrite-nitrate ammonium chlorophyll a	numeric assessment	000443	wet wet/dry wet/dry wet/dry	L
Pearl Harbor	Harbor waters and nearshore waters to 30' from Keehi Lagoon to Oneula Beach	nutrients turbidity suspd. solids polychlorinated biphenyls (PCBs)	prior listing prior listing prior listing fish consump. advisory			H
Pearl Harbor	Blaisdell Park	Total N chlorophyll a turbidity Total P	numeric assessment	000223	wet/dry wet/dry wet/dry wet	H
Pokai Bay	Pokai Bay (oceanic) station	Total N chlorophyll a	numeric assessment	000452	dry	L
Pokai Bay	Pokai Bay (open coastal) station	Total N chlorophyll a	numeric assessment	000451	wet/dry	L
Public Bath Beach	Public Bath Beach station	Total N chlorophyll a turbidity	numeric assessment	000162	wet/dry wet/dry wet/dry	L
Salt Lake	Salt Lake	turbidity trash	visual assessment			M

OAHU (continued)

COASTAL (continued)						
Listed Waterbody	**Geographic Scope of Listing**	**Pollutant(s)**	**Basis for Listing**	**Station ID**	**Standard**	**Priority**
Sandy Beach Point	Sandy Beach Point #1 station	Total N turbidity chlorophyll a	numeric assessment	000200	wet/dry wet/dry wet/dry	L
Waialae-Kahala Beach	Waialae-Kahala Beach station	enterococci	numeric assessment	000214	wet	L
Waialua/Kaiaka Bays	Nearshore waters to 60' from Puaena Point to a point 1.5 miles west of Kaiaka Point	nutrients turbidity susp. solids	visual assessment, prior listing			L
Waialua/Kaiaka Bays	Kaiaka Bay	enterococci Total N nitrite-nitrate ammonium chlorophyll a turbidity	numeric assessment	000170	wet wet wet/dry wet/dry wet/dry wet/dry	L
Waialua/Kaiaka Bays	Haleiwa Beach Park station	Total P Total N chlorophyll a	numeric assessment	000171	wet/dry wet/dry wet/dry	L
Waimanalo Bay	Waimanalo Bay Station	enterococci	numeric assessment	000196	wet	L
Bellows Beach	Bellows Beach (Waimanalo Stream mouth) station	enterococci	numeric assessment	Bellows5	dry	L
Bellows Beach	Bellows Beach (north runway) station	enterococci	numeric assessment	Bellows4	wet	L

Explanation of Major Changes and Omissions

For streams, all listing/delisting changes were based on HIDOH Clean Water Branch data. For coastal areas, additional stations were added based on analyses of data from outside sources.

Hawaii - Streams

1) Aamakao Stream provided enough samples to separately analyze turbidity by season. This stream remains listed for turbidity (dry season) based on data that showed exceedance of the dry season turbidity standard.
2) Honolii Stream will remain listed for turbidity (dry season – visual basis) based on the limited data available. The stream will be delisted for wet season turbidity since adequate numeric data showed attainment of the wet season turbidity standard. This stream is also delisted for nutrients (wet season) since nutrient data showed no exceedance for wet season standards. More data are needed to evaluate the dry season nutrient standards and the stream will, therefore, remain listed for nutrients (dry season – visual basis). This stream should be included in future monitoring plans.
3) Kapehu Stream is a new listing and is listed for turbidity (dry season) based on recent data that showed exceedance of the dry season turbidity standard. The turbidity (wet season) numeric data was within the standard.
4) Kolekole Stream was delisted for turbidity since the geometric mean of the data available was within the standards. This stream is also delisted for nutrients (wet season) since nutrient data showed no exceedance for wet season standards. More data are needed to evaluate against the dry season nutrient standards. The listing for nutrients (dry season – visual basis) will remain until more dry season data are gathered. This stream should be included in future monitoring plans.
5) Lalakea Stream is newly listed for turbidity (dry season) based on recent data that showed exceedance of the dry season turbidity standard. More data are needed to evaluate against the wet turbidity standard. This stream should be included in future monitoring plans.
6) Niulii Stream remains listed for turbidity based on recent data that showed exceedance of the dry season turbidity standard.
7) Waikama Stream was delisted for turbidity (wet season) based on recent data that showed exceedance of only the dry season turbidity standard. Enough data from samples from Waikama Stream was present to separate the analysis for a seasonal comparison of turbidity
8) Wailuku Stream was delisted for turbidity (both seasons) and nutrients (wet season) based on the data available. The listing for nutrients (dry season – visual basis) will remain until more dry season data are gathered. This stream should be included in future monitoring plans.
9) Wailoa/Waipio Stream is newly listed for Nitrite/Nitrate (NO_3+NO_2-N) based on limited data that showed exceedance of the dry season standard by a factor of two. This stream should be included in future monitoring plans.
10) Wainaia Stream was listed for turbidity based on data that showed exceedance of the wet season turbidity standard. More turbidity data are needed to evaluate the dry season standard. This stream should be included in future monitoring plans.

Kauai – Streams

1) Hanalei River will remain listed for turbidity (dry season – visual basis) based on limited data available. The stream will be delisted for turbidity (wet season) since recent combined numeric data showed attainment of the wet season turbidity standard.
2) Hanamaulu Stream was changed from visual to numeric basis listing for turbidity (wet season) based on combined data showing an exceedance of the wet season turbidity standard.
3) Hanapepe Stream remains listed for turbidity (wet season – visual basis) based on limited data available. The stream will also remain listed for turbidity (dry season) based on recent combined numeric data showed exceedance of the wet season turbidity standard.
4) Huleia Stream remains listed for turbidity (dry season – visual basis) based on limited data available for the dry season. The stream is delisted for turbidity (wet season) since recent numeric data showed attainment of the wet season turbidity standard. This stream is also listed for Nitrite/Nitrate (NO_3+NO_2-N) for the wet season standard. More data are needed to evaluate against the dry season standards. This stream should be included in future monitoring plans.
5) Kapaa Stream will remain listed for turbidity (dry season – visual basis) based on limited data available. The stream will be listed for turbidity (wet season) since recent numeric data showed exceedance of the wet season turbidity standard.
6) Kilauea Stream is newly added to the list for turbidity (wet season) exceedance based on combined numeric data.
7) Lawai Stream is newly added to the list for turbidity (wet season) exceedance based on combined numeric data. The stream will be listed for Nitrite/Nitrate (NO_3+NO_2-N) since recent limited numeric data showed exceedance of the dry season turbidity standard by a factor of 2.
8) Nawiliwili Stream remains listed for turbidity (dry season – visual basis) based on limited data available for the dry season. The stream is listed for turbidity (wet season) since recent numeric data showed exceedance of the wet season turbidity standard. This stream is also listed for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) for the wet season standards. More data are needed to evaluate against the dry season standards. This stream should be included in future monitoring plans.
9) Puali Stream is newly added to the list for Nitrite/Nitrate (NO_3+NO_2-N) since recent limited numeric data showed exceedance of the wet season standard by a factor of 2.

Kauai - Coastal

1) Three stations Hanalei Landing, Hanalei Pavilion and Hanalei Pinetrees are added for entercocci based on exceedance of the standard
2) Hanalei River – Weke Road and Dolphin Restaurant is listed due to numeric data for turbidity that exceeds the estuarine standard.
3) Waikoko, Waioli, and Waipa stream estuary areas are listed due to numeric data for turbidity that exceeds the estuarine standard.

Maui – Streams

1) Waipio Stream is newly listed for turbidity (wet season) based on limited data that showed exceedance of the wet season turbidity standard by a factor of 2.

Maui – Coastal

1) Cove Park is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
2) Kamala Park was listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Ammonium, Total Nitrogen (Total N) and chlorophyll a.
3) Kalepolepo Station was listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
4) Kaunoulu Station was listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
5) Kealia Pond Station was listed for chlorophyll a based on recent data that showed exceedances.
6) Keawakapu is listed for exceedances of the standards for Nitrite/Nitrate (NO_3+NO_2-N) and chlorophyll a.
7) Keehi Boat Ramp is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
8) Kulanihakoi Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), ammonium, Total Nitrogen (Total N) and chlorophyll a.
9) Luana Kai Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), ammonium, Total Nitrogen (Total N) and chlorophyll a.
10) Ma'alaea Harbor station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
11) Maui Coast Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), and chlorophyll a.
12) Mokulele Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
13) South Kam 2 Station is listed for exceedances of the standards for Nitrite/Nitrate (NO_3+NO_2-N), and chlorophyll a.
14) South Lipoa Station is listed for exceedances of the standards for turbidity and chlorophyll a.
15) Honokeana Cove is listed for exceedances of the standards for turbidity and Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
16) Kahana Cove station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.
17) Kahana Sunset Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N) and chlorophyll a.
18) Kahana Village station is listed for exceedances of the standards for turbidity and chlorophyll a.
19) Kaopala Bay is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), ammonium, Total Nitrogen (Total N) and chlorophyll a.
20) Lokelani Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N) and chlorophyll a.
21) Mala Station is listed for exceedances of the standards for turbidity and chlorophyll a.
22) Napili Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N) and chlorophyll a.
23) Papakea Station is listed for exceedances of the standards for turbidity and chlorophyll a.
24) Puamana Station is listed for exceedances of the standards for turbidity and chlorophyll a.

25) S-Turns Station is listed for exceedances of the standards for turbidity, Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and chlorophyll a.

Oahu – Streams

1) Heeia Stream is newly added to the list for Nitrite/Nitrate (NO_3+NO_2-N) since recent limited numeric data showed exceedance of the wet season standard by a factor of 2.
2) Kaalaea Stream is newly added to the list for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since numeric data showed exceedance of the dry season standards. This stream is also listed for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since recent limited numeric data showed exceedance of the wet standards by a factor of 2.
3) Kahaluu Stream is delisted for Total Nitrogen (Total N) and Total Phosphorus (Total P) nutrients based on the combined data showed no exceedances of the dry standards. Kahaluu Stream is also delisted for Nitrite/Nitrate (NO_3+NO_2-N) for wet season based on combined data, but the listing for Nitrite/Nitrate (NO_3+NO_2-N) for dry season standard will remain. This stream is also delisted for turbidity (wet season) since numeric data showed attainment of the standard. Kahaluu Stream remains listed for turbidity (wet season – visual basis) until more data are gathered.
4) Kalauao Stream is newly listed for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since recent limited numeric data showed exceedance of the wet season standards by a factor of 2.
5) Kalihi Stream is delisted for turbidity (wet season) since numeric data showed attainment of the wet season standard. The stream maintains the turbidity (dry season) listing since numeric data showed exceedance of the dry season standard. This stream maintains the listing of nutrients Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since numeric data showed exceedance of the wet season standards. This stream is also listed for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since recent limited numeric data showed exceedance of the dry season standards by a factor of 2. The stream is delisted for Total Phosphorus (Total P) based on numeric data that shows no exceedance of both standards.
6) Kamooalii Stream listing for turbidity (dry season) is confirmed by numeric data that exceeds the standard by a factor of 2.
7) Kaneohe Stream is delisted for turbidity (wet season) and maintains the turbidity (dry season) listing based on numeric data for both seasons.
8) Kapakahi Stream listing for Nitrite/Nitrate (NO_3+NO_2-N), Total Nitrogen (Total N) and Total Phosphorus (Total P) is upheld since recent limited numeric data showed exceedance of the dry season standards by a factor of 2.
9) Keaahala Stream is delisted for turbidity (wet season) since numeric data showed attainment of the wet season standard. The stream maintains the turbidity (dry season) listing since numeric data showed exceedance of the dry season standard. This stream maintains the listing of nutrients Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since numeric data showed exceedance of both seasons standards. The stream is delisted for Total Phosphorus (Total P) based on numeric data that shows no exceedance of wet season standards, but maintains the Total Phosphorus (Total P) listing based on exceedance of the dry season standard.

10) Nuuanu Stream is listed based on numeric data that showed exceedance of both seasons turbidity standard. This stream maintains the listing of nutrients Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since numeric data showed exceedance of the wet season standards. This stream is also listed for Nitrite/Nitrate (NO_3+NO_2-N) and Total Nitrogen (Total N) since recent limited numeric data showed exceedance of the dry season standards by a factor of 2. The stream is delisted for Total Phosphorus (Total P) based on numeric data that shows no exceedance of the both standards.
11) Waiahole Stream is newly listed for Nitrite/Nitrate (NO_3+NO_2-N), since recent limited numeric data showed exceedance of the wet season standard by a factor of 2.
12) Waikele Stream is currently under study for TMDLs.
13) Waimalu Stream listing for turbidity is confirmed with numeric data that showed exceedance of the wet season standard by a factor of 2.

Oahu – Coastal
No changes are noted for this listing cycle.

FUTURE MONITORING

Many of the data sets analyzed in this report provided insufficient support for listing/delisting decisions. Although this information was inadequate for our purposes, it should be publicly reported. The table in APPENDIX C summarizes the information gained from these analyses, which should be helpful in prioritizing future monitoring efforts. In addition to APPENDIX C, waterbodies that may be estuarine and are listed for enterococci should be evaluated to determine whether they are in fact estuarine. The State enterococci criterion currently does not apply to estuaries (salinity of greater than 0.5 parts per thousand (ppt) and less than 32 ppt) or freshwater bodies with salinity of less than 0.5 ppt.

ASSIGNMENT OF STREAMS INTO EPA CATEGORIES

In the process of identifying waters that meet the listing criteria for the Impaired Waters List, HIDOH was also able to identify where waters should be positioned in the new categories established in EPA's integrated 303(d)/305(b) guidance. As a reminder (see page 6, Introduction), the guidance requests that states sort all waters into one of the following categories:

(1) All designated uses are met;
(2) Some designated uses are met, but data are insufficient to support a decision on the remaining designated uses;
(3) Data are insufficient to support a decision on whether any designated uses are met;
(4) A waterbody is impaired or threatened but a Total Maximum Daily Load (TMDL) is not needed if
    a. A TMDL has been completed for all listed parameters;
    b. Required control measures are expected to result in Water Quality Standards (WQS) attainment in a reasonable period of time;
    c. The impairment of threat is not caused by a pollutant;

(5) Water is impaired or threatened and a TMDL is needed.

Determining whether a water body can be appropriately classified in Category 1,"All designated uses are met," requires extensive knowledge of the health of a water body. Collection of physical, chemical and biological data that indicate that all water quality standards and uses are being attained is fundamental to this classification. At this time, HIDOH has determined that not enough data has been collected to assign any waterbody to this category.

Category 2 contains 4 streams that have data that show attainment of some of the water quality standards; however, all data sets are not complete and/or consistent with the state's listing methodology. Therefore, HIDOH cannot determine whether all designated uses are met. Punaluu Stream on Oahu, Honokohau Stream on Maui, Opaekaa Stream on Kauai and Waialua Stream on Molokai are assigned to this category.

Many of the state's waterbodies fall into Category 3, "data are insufficient to support a decision on whether any designated uses are met." This category includes most of the waterbodies in Appendix C, except the waterbodies that are currently on the 303(d) List. The waterbodies that are currently 303(d) listed for specific water quality parameters, but need more data to determine compliance with other water quality standards, will be sorted into Category 5.

Only one waterbody is in Category 4. Waimanalo Stream is in Category 4a because all TMDLs that correspond to the listing decision have been EPA-approved. Two other waterbodies, Kapaa Stream and the Ala Wai Canal have limited TMDLs but remain on the 303(d) List for other pollutants that have not yet had TMDLs developed. There are no waterbodies in Category 4b; where control measures are expected to result in WQS attainment in a reasonable period of time. There may be potential for waterbodies to be assigned to Category 4c. More study is required to determine if the cause of impairments or threats to many of Hawaii's waterbodies is pollution or other factors such as invasive species or water diversions. Some candidates may be those listed in Appendix C where a Use Attainability Assessment shows diversions or canal modifications exist. An evaluation must be made as to the existing uses of the surface water, and what designated uses correspond. Most of these are streams that need more data to inform decision-making.

The majority of this report pertained to Category 5, "water is impaired or threatened and a TMDL is needed." All of the waterbodies that are on the 2004 List (see Table 5) can be assigned to Category 5, with the exception of the one, Waimanalo Stream, with approved TMDLs for listed pollutants.

TABLE 6: Surface Waters Sorted into EPA's Recommended Categories

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5
All designated uses are met (WQS)	Some designated uses are met, but insufficient data exist to evaluate all uses	Insufficient data exist for decision making	Impaired, but TMDL not needed	TMDL needed
No waters surveyed to Jan. 2004 meet all designated uses	Punaluu Stream - Oahu Honokohau Stream - Maui Opaekaa Stream – Kauai Waialua Stream - Molokai	Please refer to Appendix C, pg. 63 for a list of waterbodies needing more data	4A – Waimanalo Stream, Oahu B – None 4C – Waterbodies need to be evaluated further	Please refer to Table 5, pg. 25, for listed waters

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APPENDIX A: 2004 Listing & Delisting Criteria for Hawaii State Surface Waters Compiled under Clean Water Act §303(d)

Section 303(d) of the federal Clean Water Act requires states to list impaired waters every two years after reviewing "all existing and readily available water quality-related data and information" from a broad set of data sources and to submit this list to the U.S. Environmental Protection Agency (EPA). If previously listed waters are not listed on the subsequent list, "good cause" must be demonstrated on the basis of availability of newer and/or more accurate water quality data, discovery of past analytical flaws, or changes in conditions such as closing of a discharge pipe or implementation of major non-point source pollution controls.[5]

For the 2004 List, the Hawaii State Department of Health (HIDOH) screened available data according to listing criteria, below, that allow sorting of surface water quality data into one of three priority rankings for decision-making. Data evaluated at the end of the current listing cycle shall have been collected within the six-year period prior to each EPA-required submittal deadline. A six-year window was chosen to ensure that data reviewed for each listing cycle are both recent and available in sufficient quantity to warrant a statewide water quality data review. In the process of generating this list, the State is assuming that waterbodies meet water quality standards unless a weight-of-evidence approach shows otherwise.

The format of Hawaii's Water Quality Standards[6] differs from other states' standards in that many of the criteria are expressed as geometric means of a representative data set, and are not intended for comparison with single sample values. The criteria contain allowances for rainfall events in the form of less strict "10 per cent" and "2 per cent" criteria. Because funding is limited for monitoring waterbodies in Hawaii, we use minimum sample size requirements to ensure a reasonable level of sampling of a waterbody over time and space. These sample sizes are not strict cutoffs, rather they are guides meant to systematize decision-making by the Department of Health in protection of environmental health and public health.

<u>Data Sources</u>:

Data from the following sources may be used for making listing or delisting decisions in addition to or instead of routine HIDOH Clean Water Branch sampling, provided that an acceptable written Quality Assurance/Quality Control (QA/QC) Plan or other documented data quality assurance process was utilized during sample collection and analysis and is available for review, if requested:

1) United States Geological Survey (USGS)
2) National Oceanic & Atmospheric Administration (NOAA)
3) Universities
4) Community groups, individuals & respondents to a published, statewide "Call for Data"
5) HIDOH Hazard Evaluation and Emergency Response Office (HEER)
6) Military
7) United States Fish and Wildlife (USFWS)
8) Superfund investigation and remediation projects

[5] Federal regulations concerning the listing process can be found at 40 CFR Part 130.7.
[6] State Water Quality Standards can be found at HAR 11-54.

9) United States Department of Agriculture (USDA)
10) Special projects by HIDOH Clean Water Branch
11) Other government agencies
12) Environmental Assessments and Environmental Impact Statements
13) Consulting Firms
14) Private & public entities operating under water pollution control permits

Basic Data Quality Requirements for All Listing Priorities:

Acceptable written QA/QC documentation appropriate for the project, and containing descriptions of procedures used during sample collection and analysis, must be available for review, if requested.

Additional Data Quality Requirements for Listing Priority 1:

1. Photographs and written descriptions of the sampling sites are available upon request.
2. A general visual assessment of the water body that contains sufficient information to place the water body in the context of surrounding land uses and overall condition of the habitat is also available upon request.

Listing Priority 1:

Waters will be listed if these criteria are met for conventional pollutants such as total suspended solids, nutrients and temperature and toxic substances compiled in the Hawaii Administrative Rule, Chapter 11-54, Water Quality Standards:

1. For conventional pollutants, at least ten (10) samples per water body were collected and analyzed, the geometric mean[7] of the data for a single waterbody exceeds the corresponding geomean criterion and at least one of the following requirements is met:
    a. For streams, there must be at least two stations per stream (upper and lower) and at least five (5) samples per station.
    b. For non-flowing fresh water bodies such as ponds and reservoirs, and for tidally-influenced water bodies such as estuaries and coastal waters, the samples must be distributed either on transects or randomly over the extent of the water body or section of water body sampled. In order to obtain a representative sample for evaluating water quality over the area of concern, not only at a single point, samples should be collected along onshore-offshore transects extending seaward at least 50 feet, or at randomly scattered points across the surface of the area of concern.

[7] The concept of a geometric mean may seem confusing: the nth root of the product of n numbers. However, people use an "arithmetic" mean in every day life for averaging. Unlike an "arithmetic" mean, a "geometric" mean or "geomean" multiplies numbers rather than adding them to find an average. This method allows people to use geometric means when they have highly variable number sets and do not want a few high or low values to distort an average.

2. In order to independently evaluate the "10% of the time" and "2% of the time" numeric criteria, sample sizes for the 10% criteria must be 100, for the 2% criteria must be 500. For listing, calculations using these data sets must exceed the corresponding criteria.
3. For toxic substances, at least three samples per water body were collected and analyzed, and the sample geometric mean exceeded the corresponding numeric criterion listed in §11-54-04(a).

Listing Priority 2:

Waters may be listed if all data requirements under Listing Priority 1 are not met, provided that at least one of the following factors is met and sufficient site documentation is available:

1. For Conventional Pollutants,
    a. At least ten (10) samples per water body were collected and analyzed, but wet and dry season data must be combined because insufficient sample sizes exist to evaluate the wet and dry standards separately (Note: if the geometric mean of this data only exceeds the dry season standard, a majority of the dry season sample values must exceed the dry season standard to warrant listing; however, if the geometric mean of this data exceeds both the wet and dry season standards, the waterbody may be listed for both wet and dry exceedances), this category is referred to as Priority Listing 2a.
    b. The majority of sample values in a data set of 5 - 9 values for a single waterbody exceed the corresponding geometric mean criterion in the rule by a factor of 2 or more, this category is referred to as Priority Listing 2b.
    c. Calculations with a sample size of 50 to 90 show exceedance of the corresponding "10% of the time" criterion or
    d. Calculations with a sample size of 250 to 450 show exceedance of the corresponding "2% of the time" criterion.
2. The type of water quality problem identified is particularly severe (i.e., each of two measurements of a toxic substance is more than twice the corresponding water quality criterion). This category is referred to as Priority Listing 2c.
3. For narrative information, at least three sampling events are presented, direct correlations to the narrative criteria in 11-54-04 can be established and the narrative standards are not attained. Data sets for evaluation of narrative criteria must include at least 3 sampling events and represent conditions in both the wet and dry seasons. These narrative criteria may be evaluated using HIDOH approved habitat or biological assessments as long as they can be directly correlated to specific narrative criteria in HAR 11-54-04. This category is referred to as Priority Listing 2d.
4. For toxic substances, at least three samples per water body for toxic substances were collected and analyzed; compute the sample geometric mean and compare to the narrative criteria listed in §11-54-04(a). Acute toxicity standards for sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that HIDOH deems them appropriate for use in the Hawaiian environment. This category is referred to as Priority Listing 2e.

Listing Priority 3:

These waters are considered a high priority for additional monitoring; data will be assessed at the end of the next listing cycle and a listing decision made at that time:

1. ≤ 5 sample values are available for conventional pollutants.
2. <3 sampling events for determination of toxic or narrative standard exceedances.
3. Other information is limited and inconclusive.

The Department of Health reserves the right to list waters within any priority category when dilution calculations, predictive modeling, historical data or other supporting information indicate probable exceedance of the water quality standards and/or a risk to public and environmental health. These determinations will be made based on a weight of evidence approach with input from the U.S. Environmental Protection Agency.

Delisting Criteria:

Waters may be delisted if the data show that water quality standards are attained, and the appropriate sample sizes and other information required under Listing Priority 1 are available.

APPENDIX B: Communications Summary

1. **United States Geological Survey (USGS)**
   - Data accessed from website at http://wwwdhihnl.wr.usgs.gov/nawqa/ .

2. **National Oceanic and Atmospheric Administration (NOAA)**
   - No water quality data readily available.

3. **Universities**

   Water Resources Research Center
   University of Hawaii at Manoa
   - Contacted by phone.
   - As of 10/03, no information received.
   - Contacted Daniel Hoover via email on 2/24/04 regarding raw data used from his thesis. The response was that he would be publishing soon utilizing the data and would not like to release the data as yet.

4. **Community Groups, Individuals and Respondents to the 2003 "Call for Data"**
   - Hanalei Heritage River
   - Responded to Call for Data.
   - Emailed data and pertinent information.

5. **HIDOH Hazard Evaluation and Emergency Response Office (HEER)**
   - Contacted by phone
   - The HEER office only gets involved when there is a big spill (chemical, oil, etc).
   - The office usually helps with the clean up process and rarely takes samples.

6. **Military**
   - Contacted Jay Silberman, Coast Guard, regarding data from Haiku Valley, Oahu, soil and surface water samples. Referred to Chris Swenson, Fish and Wildlife Service, who said the data was 15 years old. Doesn't even remember if a report was filed. Will look for it.

7. **United States Fish and Wildlife (USFWS)**
   - Contacted by phone.
   - See above.

8. **Superfund**
   - No water quality data readily available.

9. **United States Department of Agriculture (USDA)**
   - Contacted by phone.
   - No response.

10. HIDOH Clean Water Branch

- Received monitoring data 10/03.
- Received from Enforcement Section permit numbers, expiration dates, the receiving water bodies and the classification (one dealing with the general permit and the other dealing with individual permits). The permits usually required water quality measurement, but measurements were only done near the end of the pipe.
- Spoke with Enforcement Section representative during 10/03 to discuss copper and zinc exceedances at Barber's Point Harbor, Oahu.

11. Other Government Agencies

Department of Land and Natural Resources (DLNR)

- Contacted Division of Aquatic Resources by phone
- No response received.

12. Environmental Assessments and Environmental Impact Statements

- Reviewed Land Use documents.

13. Consulting Firms

AECOS, Inc.

- Contacted by e-mail.
- Data not readily available but Visual Assessment reports received

14. Private & public entities operating under water pollution control permits

- Covered under Clean Water Branch communications.

APPENDIX C: List of Waterbodies for Future Monitoring

The following table lists waterbodies that, through data analysis required for this report, were identified as needing additional monitoring. Lab samples refer to collecting samples and returning to the laboratory where nutrient analyses such as suspended solids, total nitrogen, nitrite/nitrate, total phosphorus, ammonium and chlorophyll a are performed. Field samples refer analyses performed in situ in the field to include turbidity, salinity, dissolved oxygen, temperature, conductivity, and pH.

Station Number**	Station Name	# of Lab Samples	# of Field Samples	Considerations	Major reasons for Low Sample Count
2-1-15	Lumahai	1	4/8		Upper Site Inaccesible
2-1-17	Waipa	1	4/8		Upper Site Inaccesible
2-1-18	Waioli	8	14	Drains into listed coastal station (enterococci)	
2-1-19	Hanalei	8	18	Listed in 1998 for turbidity	
2-1-25	Kalihiwai	1		Drains into listed coastal station (enterococci)	
2-1-25	Kalihiwai		4/8	Candidate for UAA*	Upper Site Inaccessible
2-1-28	Kilauea	8	14/15		
2-1-34	Moloaa	8	14		
2-2-01	Anahola	7	12		
2-2-04s	Kapaa	8	16	Listed in 1998 for turbidity	
2-2-08s	Wailua	16	25	Mouth Listed in 1998 for enterococci, 2002 data shows NO turbidity exceedance	
2-2-10	Wailua		0/2	Candidate for UAA*	No sampling, site located in Estuary
2-2-12	Hanamaulu	4	10/12	Listed in 1998 for turbidity	
2-2-13	Nawiliwili	10		TMDL in preparation	
2-2-14	Puali	6	10/12	TMDL in preparation	
2-2-15	Huleia	19	21/25	Listed in 1998 for turbidity	
2-3-01	Kipu	5	5		
2-3-04	Lawai	10	15/16	2004 listing for turbidity. More data needed	
2-3-07	Hanapepe	11	13/18	Listed in 1998 for turbidity, 2002 Visual Assessment indicates possible impairment by other parameters	
2-4-04	Waimea	2	6/10	Listed in 1998 for turbidity	
3-1-03	Paumalu		0/4	Candidate for UAA*	DRY or brackish water
3-1-04	Kawela	1		Candidate for UAA*	
3-1-04	Kawela		2/10	Candidate for UAA*	DRY or brackish water
3-1-05	Oio		1/5	Candidate for UAA*	DRY
3-1-06	Malaekahana		4/10	Candidate for UAA*	DRY
3-1-07	Kahawainui		1/5	Candidate for UAA*	DRY
3-1-08	Wailele	1	12	Turbidity exceedance (Priority 2b).	
3-1-09	Koloa	1	4/6		DRY
3-1-10	Kaipapau	2	6/10	Candidate for UAA*	DRY
3-1-11	Maakua		1/5	Candidate for UAA*	DRY
3-1-13	Kaluanui	1	4/5		DRY
3-1-16	Punaluu	22	30	More data needed for dry season.	
3-1-18	Kahana	6	12/16	Drains into 1998 listed coastal segment (tradtl. pollutants)	inaccessible
3-2-02	Waikane	6	10/18	2002 Visual Assessment indicates possible moderate impairment by turbidity and trash	inaccessible

*Since these streams were dry during many of the sampling events, a preliminary evaluation may be conducted in the future to determine whether a Use Attainability Analysis (UAA) is warranted. This process is formally described in 40 CFR 131.10.

** These codes denote stream location and were adopted from the Hawaii Stream Assessment (COWRM and NPS 1990). The first number in each code represents the island (2=Kauai, 3=Oahu, 4=Molokai, 6=Maui and 8=Hawaii). For further information regarding these codes, please consult the Hawaii Stream Assessment.

APPENDIX C: Future Monitoring (cont.)

Station Number**	Station Name	# of Lab Samples	# of Field Samples	Considerations	Major reasons for Low Sample Count
3-2-04	Waiahole	10	14/20	2002 data shows NO turbidity exceedance	inaccessible
3-2-05	Kaalaea	20	20/20		
3-2-07s	Waihee/Kahaluu	16	18/48	More data on different days is necessary	
3-2-08	Heeia	12	16/20	Drains into 1998 listed coastal segment (tradtl. pollutants)	
3-3-09	Nuuanu	20	26/28	Needs more dry season data	
3-3-11	Kalihi	20	26/28	Needs more dry season data	
3-3-12	Moanalua	6	9/24	Candidate for UAA*	UPPER SITE DRY
3-4-02	Halawa	4	6/12	Candidate for UAA*. Biological Assessment showed stream may be impaired	DRY
3-4-03	Aiea	4	5/12		
3-2-04	Kalauao	9	14/22	site selection needs to be evaluated	
3-4-05	Waimalu	4	6/12	Candidate for UAA*	DRY
3-4-06	Waiawa	4	5/12	Candidate for UAA*	DRY
3-4-11	Honouliuli	2	0/6	Candidate for UAA*	DRY
3-5-04	Mailiili	0	0	Mailiili Beach identified by NRDC as one of the 70 dirtiest beaches in America	
3-6-06	Kiikii	4	6/16	Candidate for UAA*, 2002 Visual Assessment scored medium to high	DRY
3-6-07	Paukauila	4	9/14	Listed in 1998 for nutrients and turbidity	No access to upper watershed
3-6-08	Anahulu	2	4/7	Listed in 1998 for nutrients and turbidity	No access to upper watershed
4-1-09	Pelekunu	0	6/9		inaccessible
4-2-01	Pohakupili	0	0/2	Candidate for UAA*	Dry
4-2-02	Honoulimaloo	0	2		
4-2-03	Honouliwai	0	6	Drains into listed coastal segment (traditional pollutants)	
4-2-04	Waialua	12	14/21	Drains into 1998 listed coastal segment (traditional pollutants, entero, chor) more dry data needed	
4-2-05	Kainalu	0	1/6	Candidate for UAA*	DRY or Ponded Water
4-2-06	Honomuni	0	1/3	Candidate for UAA*	DRY or Ponded Water
4-2-08	Mapulehu	0	0/12	Candidate for UAA*	DRY
4-2-09	Kaluaaha	0	0/3	Candidate for UAA*	DRY
4-2-10	Kahananui	0	0/2	Candidate for UAA*	DRY
4-2-11	Manawai	0	0/3	Candidate for UAA*	DRY
4-2-12	Ohia	0	0/3	Candidate for UAA*	DRY
4-2-13	Wawaia	0	0/12	Candidate for UAA*	DRY
4-2-14	Kamalo	0	1/3	Candidate for UAA*	DRY
4-2-15	Kawela	0	0/12	Candidate for UAA*	DRY
4-2-16	Papio	0	1/2		DRY
6-1-01	Ukumehame	10	18/20	Listed stream - more data needed	
6-1-02	Olowalu	3/4	3/12	Candidate for UAA*	DRY
6-1-03	Launiupoko	2	0/12	Candidate for UAA*	DRY
6-1-04	Kauaula	2	0/10	Candidate for UAA*	DRY
6-1-05	Kahoma	2	0/12	Candidate for UAA*	DRY
6-1-06	Waihikuli	2	0/10	Candidate for UAA*	DRY
6-1-07	Honokowai	2	0/12	Candidate for UAA*	DRY
6-1-08	Kahana	2	0/12	Candidate for UAA*	DRY
6-1-09	Honokahua		0/8	Candidate for UAA*	DRY
6-1-10	Honolua	2	2/12	Candidate for UAA*	DRY
6-1-11	Honokohau	17	10/12	2002 data shows possible turbidity exceedance	Calibration
6-2-01	Poelua		23/26	Candidate for UAA*	DRY
6-2-02	Honanana		0/4	Candidate for UAA*	Dry-one site only

APPENDIX C: Future Monitoring (cont.)

Station Number**	Station Name	# of Lab Samples	# of Field Samples	Considerations	Major reasons for Low Sample Count
6-2-03	Kahukuloa	6	12		
6-2-05	Waiolai	1	4		
6-2-06	Makamakaole	16	24/26	Listed – more dry season data needed	
6-2-07	Waihee	6	14	Listed coastal segment (turbidity and chlorophyll a)	
6-2-08	Waiehu	3	8/12		DRY
6-2-09	Iao	4	6/12	Candidate for UAA*	Lower reach DRY
6-2-10	Waikapu	9/10	12/26		Lower reach DRY
6-3-01	Maliko	2	6/20	2002 data shows turbidity exceedance (Priority 2b)	
6-3-02	Kuiaha	1/2	4/14	Candidate for UAA*	DRY
6-3-03	Kaupakulua	0/2	1/13	Candidate for UAA*	DRY
6-3-04	Manawaiiao	0/2	0/12	Candidate for UAA*	DRY
6-3-05	Uaoa	0/2	0/12	Candidate for UAA*	DRY
6-3-07	Kakipi	1	2/6	Candidate for UAA*	DRY
6-3-08	Honopou	2	5/6		Equipment Failure
6-3-09	Hoolawa	1	5/6		Equipment Failure
6-3-10	Waipio	1	5/6		Equipment Failure
6-3-11	Hanehoi	1	2/6	Candidate for UAA*	DRY
6-3-12	Hoalua	0/1	0/6	Candidate for UAA*	DRY
6-3-13	Hawawana	1	4/6		Equipment Failure
6-3-14	Kailua	1	3		
6-3-15	Nailiilihaele		2/3		DRY
6-4-01	Oopuola	1	2/3		Equipment Failure
6-4-02	Kaaiea	1	2/3		Equipment Failure
6-4-03	Kolea	1	2/3		Equipment Failure
6-4-04	Waikamoi	1	2/3		Equipment Failure
6-4-06	Puohokamoa	1	3		
6-4-07	Haipuaena	1	3		
6-4-08	Punalau	1	3	Drains into listed coastal station (enterococci)	
6-4-09	Honomanu		2/3		DRY
6-4-10	Nuaailua	2	4		
6-4-11	Piinaau	2	4		
6-4-12	Ohia	1	3/4	Listed in 1998 for nutrients, turbidity and trash	
6-4-13	Waiokamilo	2	4		
6-4-15	W.Wailuaiki	2	4		
6-4-16	E.Wailuaiki	2	4		
6-4-17	Kopiliula	2	3/4		DRY
8-1-03	Kumakua	2	0/6	Candidate for UAA*	DRY
8-1-06	Hanaula	0/2	0/12	Candidate for UAA*	DRY
8-1-07	Hapahapai	2/4	8/12		Lower reach DRY
8-1-08	Pali Akamoa	0/2	1/14	Candidate for UAA*	DRY
8-1-09	Wainaia	11/12	10/14	2002 data shows turbidity exceedance	Lower reach DRY
8-1-10	Halelua	1	4/6		DRY
8-1-11	Halawa	3	9/12		Lower reach dry
8-1-12	Aamakao	16	30	2002 data shows turbidity exceedance	
8-1-13	Niulii	16	28	2002 data shows turbidity exceedance	
8-1-14	Waikama	18	32	2002 data shows turbidity exceedance	
8-1-15	Pololu	2/4	6/12	Candidate for UAA*	Lower reach DRY
8-1-31	Waiaalala	0	4/8	Bioassessment indicates possible impairment	
8-1-44	Wailoa/Waipio	8	16	Biological assessment showed stream may be impaired.	
8-1-45	Lalakea	8	16		
8-1-47	Waiulili	2	7/8		DRY
8-1-49	Waipunahoe	1	5/9	Candidate for UAA*	DRY

APPENDIX C: Future Monitoring (cont.)

Station Number**	Station Name	# of Lab Samples	# of Field Samples	Considerations	Major reasons for Low Sample Count
8-1-50	Waialeale	1	4/8	Candidate for UAA*	DRY
8-1-51	Waikoloa	1	4/8	Candidate for UAA*	DRY
8-1-52	Kapulena		1/8	Candidate for UAA*	DRY
8-1-53	Kawaikalia	1	5/8	Candidate for UAA*	DRY
8-1-54	Malanahe		0/8	Candidate for UAA*	DRY
8-1-61	Nienie	1	3/8	Candidate for UAA*	DRY
8-1-62	Papuaa		0/8	Candidate for UAA*	DRY
8-1-65	Kahaupu		1/8	Candidate for UAA*	DRY
8-1-66	Kahawailiili		1/8	Candidate for UAA*	DRY
8-1-67	Keahua		0/8	Candidate for UAA*	DRY
8-1-68	Kalopa		1/8	Candidate for UAA*	DRY
8-1-69	Waikaalulu		2/8	Candidate for UAA*	DRY
8-1-70	Kukuilamalamahii		0/8	Candidate for UAA*	DRY
8-1-71	Alilipali		0/8	Candidate for UAA*	DRY
8-1-73	Kaumoali		1/8	Candidate for UAA*	DRY
8-1-76	Waipunahina		2/8	Candidate for UAA*	DRY
8-1-77	Waipunalau	1	3/8		
8-2-32	Hakalau	0	0	Listed in 1998 for nutrients and turbidity, 2002 Visual Assessment severely contradicts 1998 listing	
8-2-33	Kolekole	19	28/29	Listed – need more dry season data	
8-2-37	Kapehu	20	28/29	Listed – need more dry season data	
8-2-49	Kaieie	0	0	Listed in 1998 for nutrients. 2002 Visual Assessment severely contradicts listing.	
8-2-56	Honolii	16	24	Listed in 1998 for nutrients and turbidity	
8-2-60	Wailuku	17	25/26	Listed in 1998 for nutrients and turbidity. Delisted in 2002 for turbidity. Need more dry season data.	
226 (Oahu)	Waimanalo State Park	61	0	Need photographic and written documentation	
Oahu	Kalaeloa Barber's Point			Notice of Finding of Violation for Copper	
Oahu	Manuwai Canal			Data available in military investigation	
Oahu	Kumumauu Canal			Data available in military investigation	
Hawaii	Wailea Bay			Reported to have been devastated by a severe 100 year storm on January 26, 2002	

APPENDIX D: Summary of AECOS, Inc. QA/QC Methods

Prepared by Susan Burr

QA/QC methods used by *AECOS* when conducting Visual Assessments

AECOS, Inc. has a Quality Management Plan (QMP) that describes its quality system for planning, implementing, documenting, and assessing the effectiveness of activities supporting environmental data operations and other environmental programs. The QMP is approved by the US Environmental Protection Agency.

Specific QA/QC methods for this project include:
Field instruments - Optic StowAway® temperature loggers manufactured by Onset Computer Corp. and the AO handheld refractometer are calibrated and maintained regularly.
Standard methods – the surveys were conducted following the NRCS Visual Assessment Protocol Version 1.0 or DOH-EPO Standard Operating Procedures. If deviations from the written protocols occurred, a description of the deviation must be included in the report. The lead field scientist conducted all of the visual assessments, with the assistance of others specifically trained to use the protocol or having sufficient stream ecology experience.
Record keeping – Original data sheets are maintained at the *AECOS* office. The lead field scientist verified data sheets, and the lead scientist checked computer entries.