2006 STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT:

Integrated Report To The U.S. Environmental Protection Agency and The U.S. Congress
Pursuant To Sections §303(D) and §305(B), Clean Water Act (P.L. 97-117)

Chapter II
Inland Freshwaters

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Environmental Planning Office
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EXECUTIVE SUMMARY

The 2006 Integrated Report is the first effort by the Hawaii State Department of Health (DOH) to integrate both reporting requirements of the Clean Water Act (CWA) §305(b) and §303(d). The CWA §305(b) requires states to describe the overall status of water quality statewide and the extent to which water quality provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water. The CWA §303(d) requires States to submit a 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. This report must be submitted by DOH to EPA for approval by April 1, 2006. Computation of Total Maximum Daily Loads (TMDLs) for all §303(d)-listed pollutant/waterbody combinations, prepared in accordance with the priority rankings, must follow with EPA approval of each state's List.

Hawaii's 2004 §303(d) List, plus readily-available data collected from any State water bodies over the past six years constitute the information reviewed for this 2006 Integrated report. Decisions to list, de-list or not list a waterbody, for which data exist and have been reviewed, must be documented (40 CFR §130.7). The periodic listing process allows DOH to list, delist, or more clearly articulate or delineate the parameters for which the waterbodies are listed.

Public health concerns may be underreported. Leptospirosis is not included as a water quality standard parameter. However, all freshwaters within the state are considered potential sources of Leptospirosis infection by the epidemiology section of the Hawaii State Department of Health. No direct tests have been approved or utilized to ascertain the extent of the public health threat through water sampling. Epidemiologic evidence has linked several illness outbreaks to contact with freshwater, leading authorities to issue blanket advisories for all fresh waters of the state. Additionally, there are several locations that have been identified and posted as areas where fish and shellfish should not be consumed. These areas include: Pearl Harbor, Ala Wai Canal and urban streams of Honolulu. Contamination of fish and shellfish include organochlorine pesticides and/or PCBs and lead.

DOH's 2006 303(d) List contains a total of 93 stream segments. Kolekole stream on Hawaii was entirely delisted and several modifications for other waterbodies were made within listings. Seventeen new streams were listed. Within the 93 listed inland freshwater perennial streams, there were a total of 296 individual pollutant/waterbody combinations. The most common listing was turbidity with 101 instances of exceedance. The next most common listings were Nitrite/Nitrates, Total Nitrogen, and Total Phosphorus with 75, 67, and 41 instances of exceedance, respectively. There were 5 instances of Dieldrin listings, 2 Chlordane, 2 Total Suspended Solids, and 1 listing for Metals/Lead.

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PART A. INTRODUCTION

The federal Clean Water Act (CWA) requires states to prepare and submit biennial reports of waterbodies that have been assessed. These reports have previously been separated into two final components. One report identifies waterbodies that are not expected to meet state water quality standards, even after application of technology-based effluent limitations. This component 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 List 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. The second required report is prepared under section 305(b) of the Clean Water Act, where states are required to report biennially on the overall status of water quality. EPA's guidance for compiling the 2006 Integrated Report for 303(d)/305(b) [1] urges states to integrate their 303(d) Lists and 305(b) Reports to ensure that consistent methodologies are applied in the preparation of both documents. EPA recommends that states sort their surface waters into 5 Categories according to the following guidance:

Category 1: All designated uses are supported, no use is threatened.
Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported.
Category 3: There is insufficient available data and/or information to make a use support determinations.
Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

4a. A TMDL to address a specific segment/pollutant combination has been approved or established by EPA.

4b. A use impairment caused by a pollutant is being addressed by the state through other pollution control requirements.

4c. A use is impaired, but the impairment is not caused by a pollutant.

Category 5: Available data and/or information indicate that at least one designated use in not being supported or is threatened, and a TMDL is needed.

Hawaii State Department of Health (DOH) has sorted State surface waters into these five categories, insofar as sorting decisions are supported by the available data.

The 2006 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 DOH to EPA for approval by April 1, 2006. Total Maximum Daily Loads (TMDLs) for all listed pollutant/waterbody combinations are prepared in accordance with the priority rankings and the State-EPA schedule for submission for TMDLs. This schedule is negotiated on a continuing

[1] Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (July 29, 2005)

basis and is influenced by federal funding, state policy, data availability and a host of other factors, which vary from year to year.

Hawaii's 2004 List plus data collected from State water bodies over the past six years constitute the body of information reviewed for the 2006 Integrated Report. Decisions to list, de-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 DOH to list waterbodies which, after recent sampling, show exceedances of numeric water quality criteria; delist waterbodies (from the 303(d) section), 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.

DOH's 2006 Integrated Report, 303(d) List of Impaired Waters contains a total of 93 stream segments for which decisions of attainment or non-attainment reflect the waterbodies status as impaired. One stream was entirely delisted and there were many changes within the parameters of listed waterbodies. Usually, DOH reports the previous year totals plus any new additions to the list. However, this year DOH has segregated the decision units to classify the waters into waterbody types as described in HAR §11-54-1. Therefore, the comparison between the 2004 List and that presented in the 2006 Report is somewhat more complicated. DOH has attempted to clearly articulate the fate of previously listed waterbodies in the table of changes. There were 17 new inland water segments listed for 2006.

PART B. BACKGROUND INFORMATION

B.1. Scope of Waters in the Integrated Report

This chapter covers all freshwaters of salinity less than 0.5 parts per thousand. The original visual non-attainment data reports from the 1998 303(d) List were revisited to determine the geographic scope of the original listings. Waterbodies were partitioned according to HAR §11-54-1 by type and then listings renewed accordingly. Please see methodology section, Part C.2. for details regarding decision units for attainment decisions.

PART C. SURFACE WATER MONITORING AND ASSESSMENT

C.1 Assessment Methodology

Basic Attainment Decision Unit
As in previous Clean Water Act Section 303(d) listing cycles (and reflected in past/present 303(d) listing criteria, the basic (Tier I) attainment decision unit (hereafter "ADU" or "decision unit") for fresh inland Hawaii waters is the entire network (EN in report tables) of hydrologically connected freshwater segments (salinity <0.5 ppt) associated with a single listed stream, stream segment, or stream tributary. These freshwater segments, and thus the basic ADU, can include one or more waterbody types [as defined by Hawaii Administrative Rules Title 11 Chapter 54 (HAR §11-54; see Tables 2. and 3.), including but not limited to intermittent streams, reservoirs, and wetlands.

Tiered Approach
A tiered approach, linked with the assessment decision criteria first adopted in the 2002 303(d) listing cycle, is currently used to refine decision units for freshwater stream networks. Tier I ADUs are used for initial attainment decisions as governed by the current 303(d) listing criteria and for defining the geographic scope of "legacy" listings based on visual assessments. Tier II decision units encompass segments and partial segments that can be more narrowly defined and assessed based on existing monitoring locations, data, and boundaries between waterbody types, and are used for attainment decisions on a case-by-case basis. Tier III decision units are those established for TMDL development and other intensive monitoring and analysis purposes. Tier IV decision units are parts of Tier III decision units that can be defined based on the most detailed assessment information. Examples of Tier I, II, and III decision units are discussed below. Although no Tier IV freshwater decision units have been established for this reporting cycle, the 2006 Integrated Report guidance provides a summary of factors that can be used to structure the Tier IV decision process (see **Future Directions** below).

Decision Unit Rationale and Implementation
Decision units, in general, are intended to represent a combination of hydrologic and regulatory truth and are constrained by water quality monitoring logistics, resources and data. DOH's current focus on defining attainment decision units for streams is based on:

(a) an assumption that streams as the most widespread fresh inland waterbody type and the most important fresh inland waterbody type to assess for reaching marine water quality goals;
(b) the lack of numeric water quality standards criteria for conventional chemical and physical pollutants in most other fresh waterbody types; and
(c) the unavailability of a complete comprehensive waterbody inventory and present limitations for monitoring and assessing all waterbodies, water quality criteria, and use attainment within each waterbody type.

ADUs for fresh inland Hawaii waterbodies do not include marine waters or inland brackish or saline waterbody types, such as estuaries and anchialine pools. Thus in the 2006 Integrated Report, the estuary components of previously listed stream systems (inland brackish waterbodies) are explicitly removed from the freshwater listing, and the freshwater tributary networks of these estuaries are explicitly added if they were not previously listed (see Table 1):

TABLE 1. Revised Decision Units for Stream Systems

Previously Listed Stream System/Estuary	Newly (N)/ Previously (P) Listed Freshwater Tributaries
Wailoa River (Hawaii)	Alenaio (P)
	Waiakea (P)
Kahaluu (Oahu)	Kahaluu (P)
Kiikii (Oahu)	Poamoho (N)
	Kaukonahua (N)
Paukauila (Oahu)	Opaeula (N)
	Helemano (N)
Anahulu (Oahu)	Kawailoa (N)
Waimea (Kauai)	Waimea (P)

As noted above, Tier II decision units encompass segments and partial segments that can be more narrowly defined and assessed based on existing monitoring locations, data, and boundaries between waterbody types. Tier II attainment decisions for three stream segments are included in the 2006 Integrated Report:

- Kalauao (Oahu) – Lack of appropriate upstream sampling locations prohibits a Tier I decision unit. Based on data from two downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from the H-I freeway down to the brackish receiving waters (Pearl Harbor Estuary).
- Moanalua (Oahu) - Lack of appropriate upstream sampling locations prohibits a Tier I decision unit. Based on data from two downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from DOH's current upstream sampling location (3-3-12-U) down to the marine receiving waters (Keehi Lagoon).
- Hanamaulu (Kauai) – Lack of sufficient data from an upstream sampling location prohibits a Tier I decision unit. Based on data from a downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from DOH's current upstream sampling location (2-3-12-U) down to the marine receiving waters (Hanamaulu Bay)

Decision unit boundaries for other fresh inland waterbody types are defined on a case-by-case basis when monitoring data and other assessment information is available, but generally encompass the entire waterbody. Attainment decisions for three non-stream waterbodies are included in the 2006 Integrated Report:

- Kawainui Marsh (Oahu) – Major wetland component of stream network separated as a Tier II decision unit from downstream receiving segment (Kawainui Stream) and upstream tributary segment (Kapaa Stream).
- Salt Lake (Oahu) – Tier I "legacy" decision unit (waterbody type under review).
- Wahiawa Reservoir (Oahu) - Impoundment of the north and south forks of Kaukonahua Stream separated as a Tier III decision unit from downstream receiving segment (Kaukonahua Stream) and upstream tributary segments.

Decision Unit Delineation, Naming, Coding, and Geolocation
Numerous conventions for naming, coding, and geolocating Hawaii waterbodies and decision unit boundaries discussed above have been designed and used over time. Building a comprehensive statewide waterbody inventory that standardizes these conventions for use by DOH and others is an ongoing, intergovernmental resource management task (see **Future Directions** below). In the 2006 integrated Report, waterbody IDs for freshwater decision units are based upon the Hawaii Stream Assessment (HSA) Coding System (Hawaii Cooperative Park Service Unit, 1990). Modifications to the HSA include:

- All "s" code suffixes [identifying "stream systems," which by DOH definition (HAR §11-54) includes estuaries] in the 2004 reporting are removed from the freshwater codings for this 2006 Integrated Report.
- New suffixes are added to stream codes to indicate non-stream components of the freshwater hydrologic network, e.g. "W" for wetland (see Kawainui Marsh, Oahu, 3-2-13-W) and "R" for reservoir (see Wahiawa Reservoir, Oahu, 3-6-06.02-R), and "E" for estuary (see Kiikii Estuary, Oahu 3-6-06-E).
- Codes not included in the HSA report are created by employing the conventions described in the HSA report, consultation with related coding systems [primarily those employed by the State of Hawaii Department of Land and Natural Resources (Commission on Water Resource Management and Division of Aquatic Resources)], or using other specific rationale devised by DOH.

Geolocation of freshwater decision units is based upon various public domain digital coverages, DOH field data (GPS coordinates, station descriptions, field mapping, stream surveys, and stream assessments), and similar spatial location data submitted with third-party data packages.

Application of the criteria to attainment decisions
For streams, 303(d) listings apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of a stream system (including all hydrologically-connected reaches) unless a case is documented in which smaller decision units are justified. Similarly, for other waterbody types, 303(d) listings apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of the waterbody (including all hydrologically-connected reaches) unless a case is documented in which smaller decision units are justified. During the course of DOH water quality monitoring and watershed analysis and planning, these hydrologic networks may be partitioned into smaller decision units and information may be gathered (including new monitoring data) to support attainment decisions for these smaller units.

We urge non-DOH entities conducting similar monitoring, analysis, and planning activities to consult with DOH about sampling designs and information management protocols that will facilitate DOH's ability to use secondary data for attainment decisions. The entire hydrologic network within a watershed is the largest possible unit of decision units for inland fresh water bodies, and may include the boundaries of the following waterbody types as defined by HAR §11-54-1.

TABLE 2. Applicable Water Quality Criteria and Decision Unit Boundaries for Inland Fresh Waterbodies

Waterbody type[1]	Applicable Water Quality Criteria[2]	Decision unit boundary[3]
Flowing seep	Basic/Recreational	Flowpath/Flow surface
Flowing spring	Basic/Recreational	Flowpath/Flow surface
Elevated wetland	Basic/Recreational/Wetland	1987 Corps delineation[4]
Low wetland	Basic/Recreational	1987 Corps delineation[4]
Intermittent stream	Basic/Recreational/Water Column/Bottom	Entire network or sub-network[5]
Perennial stream	Basic/Recreational/Water Column/Bottom	Entire network or sub-network [5]
Natural freshwater lake	Basic/Recreational	Lake
Freshwater impoundment[6]	Basic/Recreational	Impoundment
Reservoir	Basic/Recreational	Reservoir
Ditch	Basic/Recreational	Ditch
Flume	Basic/Recreational	Flume
Drainage ditch[7]	Basic/Recreational	Drainage ditch
Canal[7]	Basic/Recreational	Canal

[1]Inland freshwater (<0.5 ppt dissolved organic ion concentration) waterbody types as defined by Hawaii Administrative Rules Title 11 Chapter 54, Water Quality Standards (HAR §11-54-1). These definitions are applied to the definition of decision units.

[2]Basic criteria (Narrative "free of" and numeric standards for toxic pollutants) established by HAR §11-54-4; Specific (numeric) criteria for inland recreational waters established by HAR §11-54-8(a); Specific (numeric) criteria for stream water column established by HAR §11-54-5.2(b); Specific (numeric) criteria for stream bottom established by HAR §11-54-5.2(b)(2); Specific (numeric) criteria for elevated wetlands established by HAR §11-54-5.2(c).

[3]HAR §11-54-5.1(a) establishes a system of waterbody classification (waterbody class is defined by underlying land use classification) and associated designated uses.

[4]HAR §11-1: "... the identification and delineation of wetland boundaries shall be done following the procedures described in the U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE 1987)."

[5]According to HAR §11-54-1 "'Stream system', means the aggregate of water features comprising or associated with a stream, including the stream itself and its tributaries, headwaters, ponds, wetlands, and estuary. A stream system is geographically delineated by the boundaries of its drainage basin or watershed." For stream attainment decision purposes, "associated" is interpreted as "hydrologically connected," and estuaries, ditches, flumes, drainage ditches, and canals are not included in the assessment.

[6]This waterbody type is not defined by rule but is included in the definition of "Standing waters."

[7]These waterbody types are not defined by rule but are included in the definition of "State waters."

DOH encourages monitoring, analysis, and planning activities that acknowledge and consider the regulatory boundaries between specific waterbody types, and that demonstrate a rationale for segmenting each waterbody into smaller decision units. The 2006 Integrated Report guidance provides a summary of factors to consider in developing these rationales:

- Partition waters to represent homogeneity in expected (v. actual) physical, biological, and chemical conditions
- Segmentation reflects *a priori* knowledge of flow, channel morphology, substrate, riparian conditions, adjoining land uses, confluence with other water bodies, and potential sources of pollutant loadings
- The expected natural variability of the measured criteria associated with the WQS
- Physical characteristics of the waterbody (segment)
- Time of travel of a parcel of water in the waterbody or segment
- The amount and type of data and information necessary to provide a reasonable accurate characterization of the criteria (or core indicators) associated with the designated uses in the segment or waterbody
- Any expected changes in significant influences in the watershed (Land use, point or nonpoint sources of pollutants)
- Any site-specific concerns such as patchy or unique habitat distribution patterns or biological population distributions
- Segments should be small enough to represent a relatively homogeneous parcel of water (with regard to hydrology, land use influences, pollutant loadings, etc.).

Methodology for Attainment Decisions

To provide both documentation and consistency when making listing decisions, DOH has utilized the same methodology as 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, limit on the age of data and sample sizes, and the amount of narrative information needed to sort data into one of three priority categories. Use of these standardized criteria will enable the DOH to periodically collect and/or assess data sets and make decisions on whether a water body should be listed, delisted or not listed in any subsequent listing cycle. The steadfast requirement for photographs is flexible for coastal areas. Photos are still required for inland waters to ensure location information is correct. Many places in Hawaii are named identically; photos help to identify the exact location of the sampling event.

Please 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, listings generally 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)[2] 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 priority ranking and listing/delisting criteria (Appendix A), waterbodies were sorted into one of three priority 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 DOH 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 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 [3]. 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 priority ranking and 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 freshwater and saltwater acute and chronic concentration criteria and fish consumption criteria. FIGURE 2 describes the general process for priority ranking and listing/delisting toxic pollutants.

Criteria for indicator bacteria, used to evaluate waters for public health risks, are now both utilizing enterococci for inland and marine waters. Indicator bacteria counts are evaluated using data within a 25 to 30 day temporal increment and also contain applicable single sample maximum values.

Biological surveys of aquatic communities, fish consumption advisories and reports of contaminated sediments are also eligible sources of listing information. These surveys are most

[2] Hawaii Administrative Rules, Chapter § 11-54

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

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 DOH-approved habitat or biological assessment methodologies 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 the contamination of sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that DOH deems them appropriate for use in the Hawaiian environment (CCME 1999; NYSDEC 1999). FIGURE 3 describes the general process for priority ranking and listing/delisting based on narrative criteria.

Basic methods for analysis remained the same 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). DOH is currently working on refining this coding system. Please see discussion of coding and decision units found in Part C.2. 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 1999-2005) and space (for inland waters, from upper and lower sampling sites. For instance, if several data values were available from one day and one site, the geomean would not be deemed sufficiently representative (temporally) 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.

Basic Process for Priority Ranking and 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 season standard. If a waterbody had 10 samples in the wet or dry condition or both, the samples were sorted by condition, and the geometric mean was calculated and evaluated against the corresponding wet and/or dry season standards. In Chapter IV, the decision is represented by: A = attainment or N = non-attainment.

Likewise, Priority 2a waterbodies were sorted by station number. If at least 10 samples were spread between both wet and dry conditions, the data were combined and the geometric means for each waterbody were first evaluated against the wet season standard, then if >5 dry samples exist, tested against the dry season standard. If data from wet and dry seasons are combined because insufficient sample sizes exist to evaluate against the standards separately and the geometric mean of these data only exceeds the dry standard, a majority (>50%) of the raw data from dry seasons must exceed the dry standard to warrant listing. In Chapter IV, the decision for combined data is represented by: Ac = attainment (combined data) or Nc = non-attainment (combined data).

The Listing Criteria specifies that for statistical significance, the “10% of the time” criteria be evaluated with a minimum sample size of 100 samples, allowing for 10+ samples being above the 10% threshold. The “2% of the time” criteria are evaluated with a minimum sample size of 500 samples, allowing for 10+ samples being above the 2% threshold. DOH believes that

environmental variability precludes the application of these criteria to smaller data sets due to the sizeable fluctuations that occur in natural systems. For example, if there were 10 data points, only 2 would be required to exceed the 10% rule, and it would require 50 data points for 2 to exceed the 2% rule. If, by chance the sampling event occurred temporally near a significant rain event, the data could be biased toward an unrealistic exceedance. In many instances, due to Hawaii's storm prone events, this could be the case. If we applied the 10% or 2 % rule, many waterbodies may be listed in error. The geometric means method removes this bias in smaller sample sizes and DOH considers it the best way to prevent statistical errors within the data set. In any event, according to the Listing Criteria, the data sets for inland waters were not large enough to apply the 10% or 2% standards, but we have included a table which analyses the data for the 10% and 2% rule with Priority 1 data (at least 10 samples), please see Table 5. Although not utilized for this report, the data is provided to allow commenters an opportunity to evaluate the potential significance of including this evaluation in future listing criteria and reports.

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 season 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. In Chapter IV, the decision for combined data exceedance by a factor of 2 is represented by: N1 = non-attainment (X2). Waterbodies and their corresponding conventional pollutant data that did not meet Priority 2 criteria were compiled for future monitoring in Priority 3 and assigned a question mark (?) in Chapter IV.

FIGURE 1: Flow Chart of Priority Ranking and Listing/Delisting Process - Conventional Pollutants

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

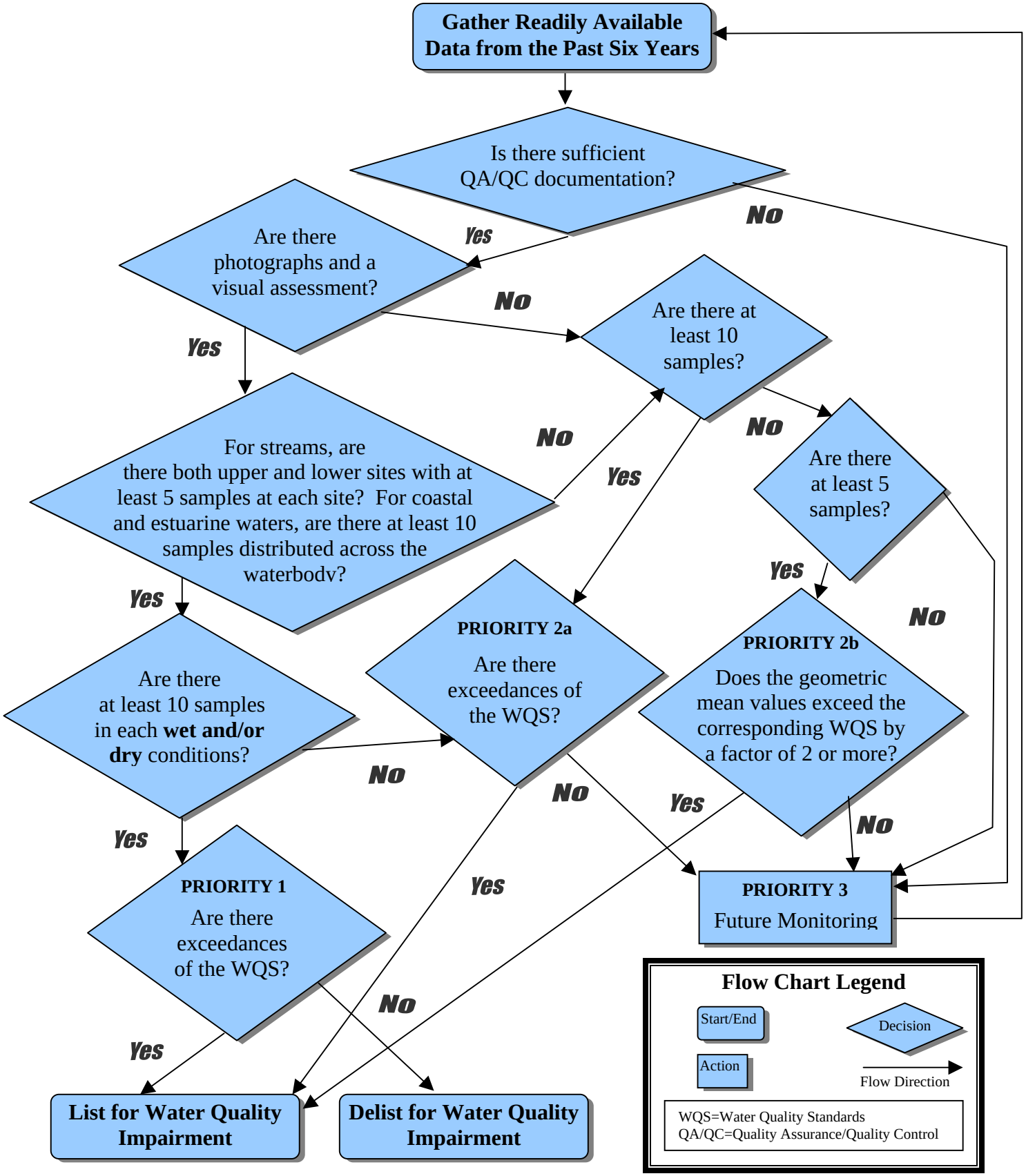


FIGURE 2: Flow Chart of Priority Ranking and Listing/Delisting Process - Toxic Pollutants

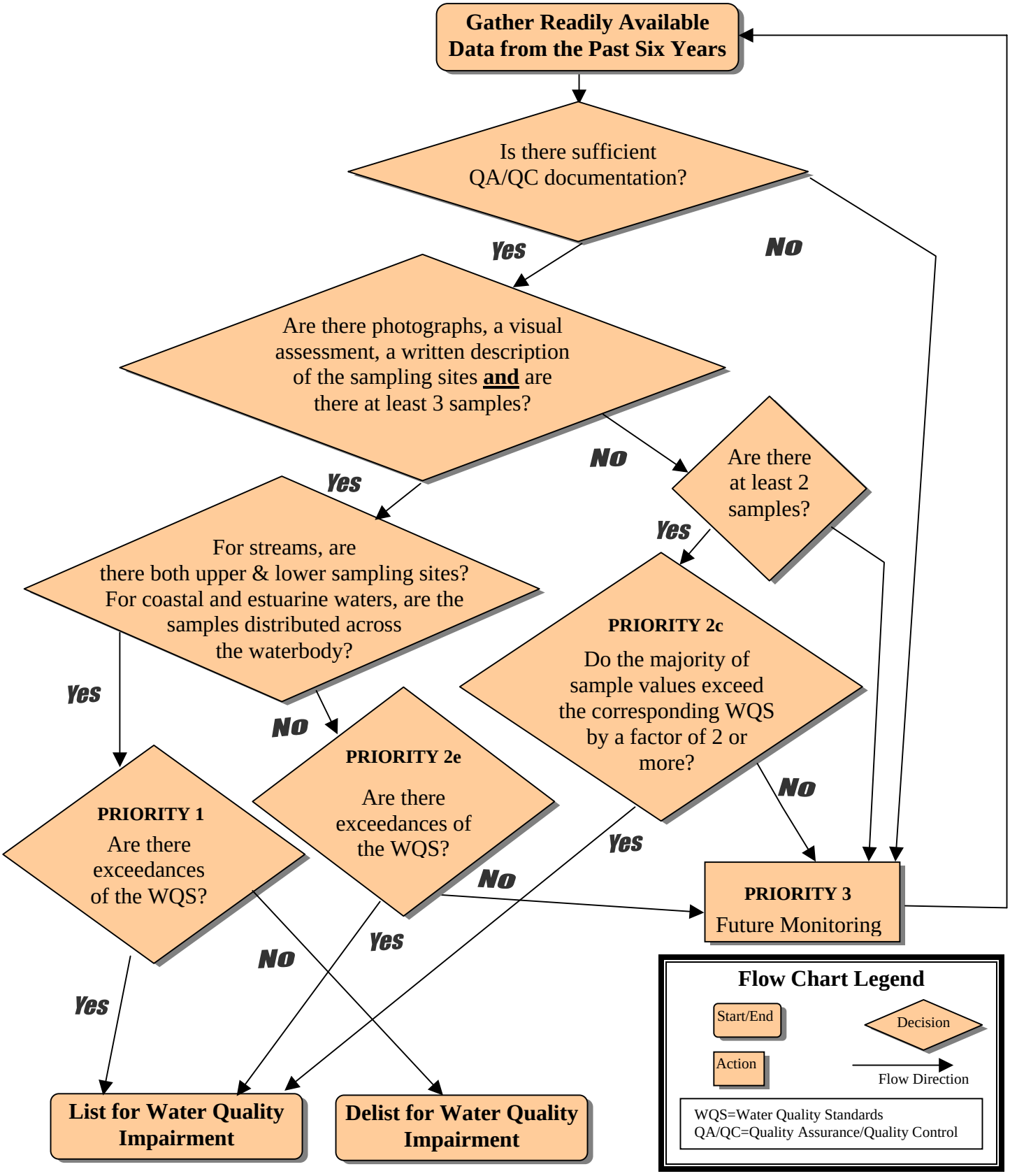
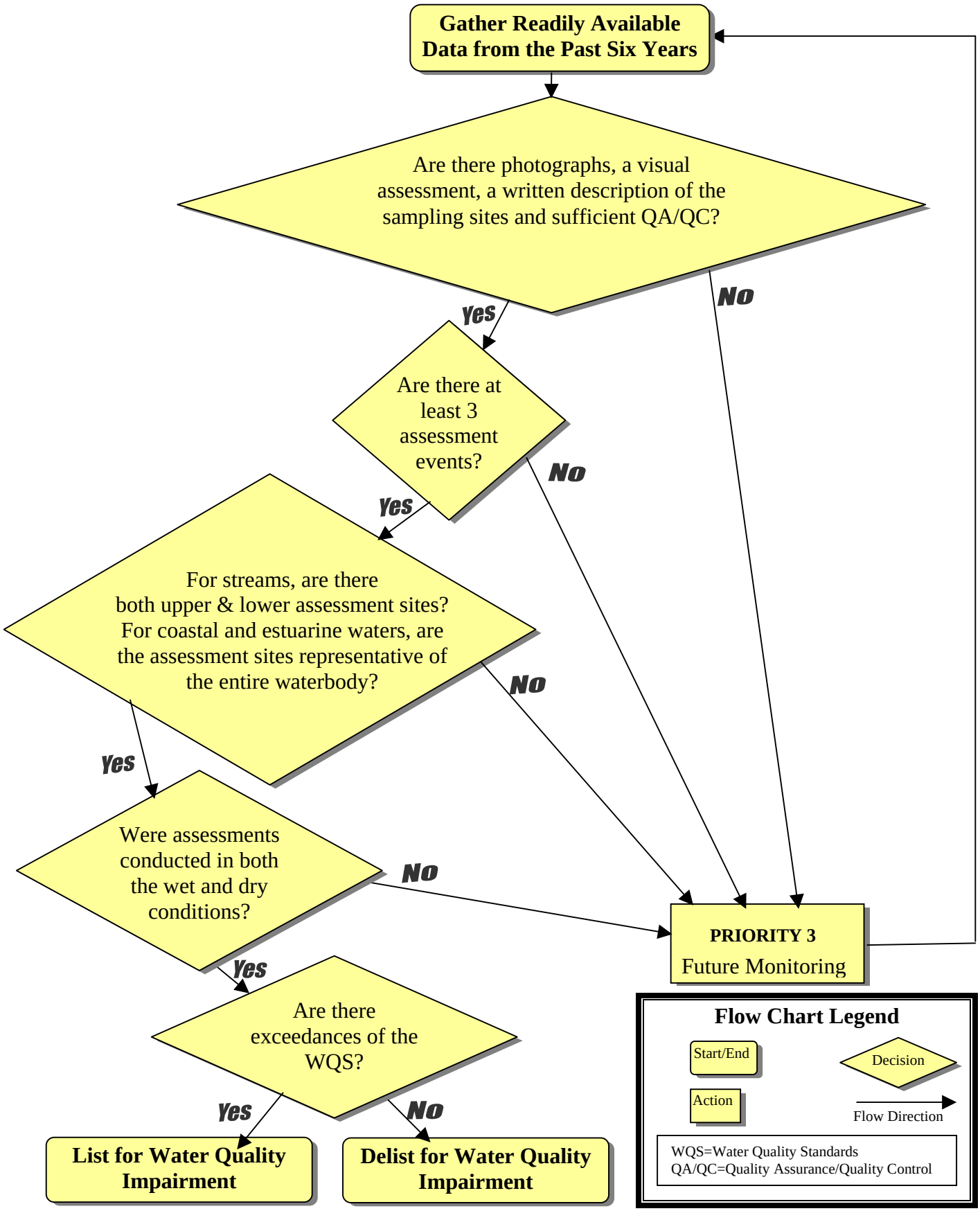


FIGURE 3: Flow Chart of Priority Ranking and Listing/Delisting Process -Narrative Criteria



Data Sources Reviewed

A formal call for data was published statewide in October 2005; a few 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. Appendix C summarizes the data submitted for consideration.

Major data sources reviewed include the following:

1. Data collected by DOH'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. Biological Assessments

   There were no new biological assessments to review.

3. Other Environmental Assessments and Investigations and permit applications

   There were no Environmental Assessments related to surface waters available for this report. Permit files were reviewed for the past 6 years. One data set was found within the files but significant issues were discovered and the data contained inadequate QA/QC to make the data defendable.

4. Other Data Sources

   Hanalei Watershed areas

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

   Heeia Stream, Kapaa Stream and Ka'elepulu area.

   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, Haiku and Kapaa, including stream, estuary and coastal areas sampling sites. Data are available at http://www.wcc.hawaii.edu/usda/Heeia and http://www.wcc.hawaii.edu/water/.

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?" DOH'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 USGS.

Various other submitted data were evaluated as to containing accessible written procedures and lab assurance documentation to validate data.

C.2 Assessment Results

C.2.1 Review of Data

Inland Streams

Seventy-four streams throughout the islands had sufficient data to evaluate whether an exceedance of the Water Quality Standards occurred. Forty-four of these streams were already listed on Hawaii's 2004 303(d) List for at least one parameter. The majority of the data used for the assessment of fresh waters came from the CWB database. Please see Tables 3 and 4 for summaries of the data evaluation.

Bacterial Data

The current WQS require the use of enterococci as the indicator bacteria for evaluating public health risks in inland waters; however, no new data was available for this parameter in inland waters. CWB efforts have been focused on coastal areas. There were no new listings for bacteria based on the data for from the Clean Water Branch.

Other Data Sources

Hanalei River - Kauai

Data for nutrients and enterococci were available from the Hanalei Watershed Hui for listing/delisting and prioritization decisions. Data were of sufficient quality and were incorporated into the master table.

Heeia, Haiku and Kapaa Streams

Sufficient data and QA/QC procedures were available from Dr. Letty Colmenares of Windward Community College for listing/delisting and prioritization decisions. The data represented sampling events over several years in three watersheds. The data agree with those collected by the Clean Water Branch of DOH (where available).

TABLE 3: Analytical Summary of Priority 1 and 2a Data – All Data Combined for Streams

Stream Code	Waterbody Name	Island	Stream on 2004 List (Y/N)	Pollutants on 2004 List	Combined Data for Conventional 1999-2005 Numeric Exceedances				
					TSS	NO3	Total N	Total P	Turb
2-1-12	Limahuli	Kauai	N		NE**	D**	NE**	NE**	NE*
2-1-13	Manoa	Kauai	N		NE*	NE*	NE*	NE*	W*
2-1-14	Wainiha	Kauai	N		NE*	NE*	NE*	NE*	NE*
2-1-17	Waipa	Kauai	N		NE**	NE**	NE**	NE**	NE**
2-1-18	Waioli	Kauai	N		NE**	NE**	NE**	NE**	NE**
2-1-19	Hanalei	Kauai	Y	Turb (V-D)	NE****	NE****	NE****	NE****	D****
2-1-28	Kilauea	Kauai	Y	Turb (W)	NE**	NE**	NE**	NE**	D**
2-1-34	Moloaa	Kauai	N		NE**	NE**	NE**	NE**	W/D****
2-1-35	Papaa	Kauai	N		NE*	D*	D*	NE*	NE*
2-2-01	Anahola	Kauai	N		NE**	NE**	NE*	NE**	W/D****
2-2-04	Kapaa	Kauai	Y	Turb (V-D) Turb (W)	NE*	NE*	NE*	NE*	W/D****
2-2-04.01	Kealia	Kauai	N		-	-	-	-	D**
2-2-08.01	Opaekaa	Kauai	N		-	-	-	-	W*
2-2-08.02	Wailua N. Fork	Kauai	N		NE*	NE*	NE*	NE*	NE***
2-2-08.03	Wailua S. Fork	Kauai	N		-	-	-	-	W***
2-2-12	Hanamaulu	Kauai	Y	Turb (W)					W/D****
2-2-13	Nawiliwili	Kauai	Y	Turb (V-D) Turb (W) NO2-NO3(W) Total N (W)	NE****	W/D****	W/D****	NE****	NE***
2-2-14	Puali	Kauai	Y	NO2-NO3 (W)	NE**	D**	D**	NE**	W*
2-2-15	Huleia	Kauai	Y	Turb (V) NO2-NO3(W)	NE****	D****	D****	NE****	NE***
2-3-02	Waikomo	Kauai	N		NE*	W*	W*	NE*	W*
2-3-04	Lawai	Kauai	Y	NO2-NO3 (D) Turb (W)	NE**	D**	D**	NE**	W/D****
2-3-06	Wahiawa	Kauai	N		NE*	W*	W*	NE*	W*
2-3-07	Hanapepe	Kauai	Y	Turb (V-W) Turb (D)	NE**	NE**	NE**	NE**	D**
2-4-04	Waimea	Kauai	Y	Turb (V)	NE**	D**	NE**	NE**	D**
3-1-16	Punaluu	Oahu	N		NE****	NE***	NE****	NE****	NE****
3-1-18	Kahana	Oahu	N		NE****	D****	NE****	NE****	D**
3-2-02	Waikane	Oahu	N		NE**	D**	NE**	NE**	NE**
3-2-04	Waiahole	Oahu	Y	NO2-NO3(W)	NE**	D**	NE**	NE**	NE**
3-2-05	Kaalaea	Oahu	Y	NO2NO3(W/D) Total N (W/D)	NE**	W/D****	W/D****	NE****	D****
3-2-07.01	Waihee	Oahu	Y	Nutrients (V)	NE**	D**	D**	NE**	D**
3-2-07.02	Kahaluu	Oahu	Y	Turbidity (V)	NE**	D**	NE**	NE**	NE**

Cont. Stream Code	Waterbody Name	Island	Stream on 2004 List (Y/N)	Pollutants on 2004 List	Combined Data for Conventional 1999-2005 Numeric Exceedances				
					TSS	NO3	Total N	Total P	Turb
3-2-08	Haiku/Heeia	Oahu	Y	NO2-NO3 (W)	NE****	W/D****	D****	NE****	W****
3-2-09	Keaahala	Oahu	Y	NO2-NO3(W/D) Total N (W/D) Total P (D) Turb (D) Trash	NE****	W/D****	W/D****	D****	D****
3-2-10	Kaneohe	Oahu	Y	Nutrients (V) Turb (W) Dieldrin	-	-	-	-	D**
3-3-09	Nuuanu	Oahu	Y	NO2-NO3(W) Total N (W/D) Turb (W/D) Trash Dieldrin Chlordane	D****	W/D****	W/D****	D****	W/D****
3-3-11	Kalihi	Oahu	Y	NO2NO3(W/D) Total N (W) Turb (D) Trash	NE****	W/D****	W/D****	NE****	D****
3-4-04	Kalauao	Oahu	Y	NO2-NO3 (W) Total N (W)	NE***	W***	W***	NE***	D**
3-4-06	Waiawa	Oahu	Y	Nutrients (V) Turb (V) Trash	NE***	NE***	NE***	NE***	-
3-4-10	Waikele	Oahu	Y	Nutrients Turbidity	NE****	W/D****	W/D****	NE****	-
3-6-06	Kiikii	Oahu	Y	Nutrients (V) Turbidity (V)	NE****	W/D****	W/D****	NE****	W*
3-6-06.01	Poamoho	Oahu		Previous Kiikii listings	-	-	-	-	-
3-6-06.02	Kaukonahua	Oahu		Previous Kiikii listings	NE***	W***	W***	NE***	W*
4-2-03	Honouliwai	Molokai	N						NE*
4-2-04	Waialua	Molokai	N		NE***	NE***	NE***	NE***	NE***
6-1-01	Ukumehame	Maui	Y	Turbidity (D)	NE**	D**	NE**	NE**	NE****
6-1-11	Honokohau	Maui	N		NE**	NE**	NE**	NE**	NE****
6-2-03	Kahakuloa	Maui	N		NE**	NE**	NE**	NE**	NE****
6-2-06	Makamakaole	Maui	Y	Turbidity (D)	NE****	NE****	NE****	NE****	D****
6-2-07	Waihee	Maui	Y	Nutrients (V)	NE**	NE**	NE**	NE**	NE****
6-2-10	Waikapu	Maui	N		NE*	NE*	NE*	NE*	NE*
6-3-08	Honopou	Maui	N						NE*
6-4-12	Ohia	Maui	Y	Nutrients (V) Turbidity (V) Trash					NE*
6-5-13	Oheo	Maui	N		NE**	NE**	NE**	NE**	NE*
8-1-09	Wainaia	Hawaii	Y	Turbidity (W)	NE*	NE*	NE*	NE*	W***

Cont. Stream Code	Waterbody Name	Island	Stream on 2004 List (Y/N)	Pollutants on 2004 List	Combined Data for Conventional 1999-2005 Numeric Exceedances				
					TSS	NO3	Total N	Total P	Turb
8-1-12	Aamakao	Hawaii	Y	Turbidity (D)	NE****	NE****	NE****	NE****	D****
8-1-14	Waikama	Hawaii	Y	Turbidity (D)	NE****	NE****	NE****	NE****	D****
8-1-15	Pololu	Hawaii	N						NE*
8-1-44	Wailoa/Waipio	Hawaii	Y	NO2-NO3 (D)	NE**	D**	D**	D**	NE****
8-1-45	Lalakea	Hawaii	Y	Turbidity (D)	NE*	NE*	NE*	NE*	D****
8-1-47	Waiulili	Hawaii	N						NE*
8-2-33	Kolekole	Hawaii	Y	Nutrients (V-D)	NE****	NE****	NE****	NE****	NE****
8-2-34	Paheehee	Hawaii	N		NE*	NE*	NE*	NE*	NE**
8-2-37	Kapeha	Hawaii	Y	Turbidity (D)	NE****	D****	NE****	NE****	D****
8-2-47	Kalaoa	Hawaii	N		NE*	NE*	NE*	NE*	NE**
8-2-49	Kaieie	Hawaii	Y	Nutrients (V)	NE**	NE**	NE**	NE**	-
8-2-53	Kapue	Hawaii	N		NE*	NE*	NE*	NE*	D**
8-2-56	Honolii	Hawaii	Y	Nutrients (V-D) Turbidity (V-D)	NE****	NE****	NE****	NE****	D****
8-2-57	Maili	Hawaii	N		NE*	NE*	NE*	NE*	D**
8-2-59	Pukihae	Hawaii	N		NE*	NE*	NE*	NE*	NE**
8-2-60	Wailuku	Hawaii	Y	Nutrients (V-D)	NE****	D****	NE****	NE****	NE**
8-2-61	Wailoa/Waiakea	Hawaii	Y	Nutrients (V)					

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 2004

Exceedance found in stream not listed in 2004

TABLE 4: Analytical Summary of Priority 2b Data – Streams (2 times the WQS)

Stream Code	Waterbody Name	Island	Stream on 2002 List (Y/N)	Pollutants on 2004 List	DOH Clean Water Branch Data 1999-2005 Numeric Exceedances				
					TSS	NO3	Total N	Total P	Turbidity
2-1-13	Manoa		N						D**
2-1-34	Moloaa		N						D**
2-1-35	Papaa		N						D**
2-2-08.01	Opaekaa	Kauai	N						D**
2-2-08.03	Wailua S. Fork	Kauai	N						D**
2-2-14	Puali		Y	NO2-NO3 (W)					D**
2-3-02	Waikomo		N			D**			D**
2-3-06	Wahiawa		N			D**	D**		D**
3-4-03	Aiea		Y	Turbidity (V) Trash		W*	W*		
3-4-05	Waimalu		Y	Turbidity (W)					W*
3-6-06.02	Kaukonahua	Oahu	Y			D**	D**		D**
3-6-06.02.1	Kaukonahua S. Fork		Y						D**
4-2-04	Waialua		N						D**
6-3-01	Maliko		Y	Turbidity (W)					W*
6-3-10	Waipio		Y	Turbidity (W)					W*
8-1-10	Halelua		N						W*
8-1-44	Wailoa/Waipio		Y	NO2-NO3 (D)		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

No Exceedance found in stream listed in 2004

Exceedance found in stream not listed in 2004

TABLE 5: Analytical Summary of Priority 1 Data – for 10% and 2% exceedance

Stream Code	Waterbody Name	Island	Season	2006 listed	10%* and 2%** Rule Application 1999-2005 Exceedances				
					TSS	NO3	Total N	Total P	Turb
2-1-19	Hanalei	Kauai	D	Turb-D					**
2-1-28	Kilauea	Kauai	D	Turb-D/W					*
2-1-34	Moloaa	Kauai	D/W	Turb-D/W					*/*
2-2-01	Anahola	Kauai	D/W	Turb-D/W					**/*
2-2-04	Kapaa	Kauai	D/W	Turb-D/W					**/**
2-2-04.01	Kealia	Kauai	D	Turb-D					*
2-2-12	Hanamaulu	Kauai	D	Turb-D/W		*			**
2-2-13	Nawiliwili	Kauai	D/W	Turb-D NO3-D/W TN-D/W		**/**	**/**		
2-2-14	Puali	Kauai	D	Turb-D/W NO3-D/W TN-D/W		**	**		
2-3-04	Lawai	Kauai	D	Turb-D/W NO3-D TN-D		**	**		**
2-3-07	Hanapepe	Kauai	D	Turb-D		**	*		*
2-4-04	Waimea	Kauai	D	Turb-D		*			*
3-1-16	Punaluu	Oahu	W						**
3-1-18	Kahana	Oahu	D	Turb-D NO3-D					*
3-2-02	Waikane	Oahu	D	NO3-D		*			
3-2-04	Waiahole	Oahu	D	NO3-D TP-D		*			
3-2-05	Kaalaea	Oahu	D/W	Turb-D NO3-D/W TN-D/W		**/**	**/**		*/-
3-2-07.01	Waihee	Oahu	D	Turb-D NO3-D TN-D		**	*		
3-2-07.02	Kahaluu	Oahu	D	Turb-D/W NO3-D		*			
3-2-08	Haiku/Heeia	Oahu	W	Turb- W NO3-D/W TN-D					*
3-2-09	Keaahala	Oahu	D	Turb-D NO3-D/W TN-D/W TP-D		**/**	*/-		

Stream Code	Waterbody Name	Island	Season	2006 listed	10%* and 2%** Rule Application 1999-2005 Exceedances				
					TSS	NO3	Total N	Total P	Turb
3-3-09	Nuuanu	Oahu	D/W	Turb-D/W NO3-D/W TN-D/W TP-D TSS-D		**/*	**/-	**/-	**/-
3-3-11	Kalihi	Oahu	D/W	Turb-D NO3-D/W TN-W		**/**			**/-
3-4-04	Kalauao	Oahu	W	Turb-D NO3-D/W TN-D/W		**	**		
6-1-01	Ukumehame	Maui	D/W	NO3-D		*		**	-/*
6-2-06	Makamakaole	Maui	D	Turb-D	*				**
6-2-07	Waihee	Maui	D	Nuts-W-V				*	
8-1-09	Wainaia	Hawaii	W	Turb-W					**
8-1-12	Aamakao	Hawaii	D/W	Turb-D					*/*
8-1-13	Nuilii	Hawaii	D/W	Turb-D					**/**
8-1-14	Waikama	Hawaii	D/W	Turb-D					**/*
8-1-44	Wailoa/Waipio	Hawaii	D	NO3-D/W TN-D/W TP-D		**	*		
8-1-45	Lalakea	Hawaii	W	Turb-D					*
8-2-37	Kapehu	Hawaii	D/W	Turb-D NO3-D		**/*	**/-		*/-
8-2-56	Honolii	Hawaii	D	Turb-D					**

C.2.2. Hawaii's 2006 303(d) List

The 2006 303(d) List includes the waterbodies on the revised 2004 List of Impaired Waterbodies minus one stream being delisted plus an additional 17 newly listed streams. Complete assessment information is found in Chapter IV. 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 Development Priorities:
TMDLs have been established for the Ala Wai Canal (revised 2002), Waimanalo Stream (approved 2001), Kawa Stream (revised 2005), and Kapaa Stream (approved 2007). TMDLs for listed streams in Kauai's Nawiliwili Bay Watershed (Nawiliwili, Puali, and Huleia); the Hanalei stream system (Kauai); Kamooalii and Kaneohe streams (Oahu); and Waiakea and Alenaio streams (Hilo Bay Watershed, Hawaii) are scheduled for completion in 2007. TMDLs for listed streams in Oahu's Pearl Harbor Watershed (Waikele, Kapakahi, Waiawa, Waimano, Waimalu, Aiea, Kalauao, and Halawa); Kaelepulu stream system (Oahu); and N. and S. Fork Kaukonahua Stream (Oahu) are expected to be completed in 2008, with ongoing phased TMDL development in Kaukonahua receiving waters (Wahiawa Reservoir, lower reaches of Kaukonahua Stream, Ki'iki'i estuary, and Kaiaka Bay). TMDL development for S. Molokai coastal waters began in 2006 (basic data collection by the U.S. Geological Survey Pacific Islands Water Science Center).

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, DOH will begin developing TMDLs for the Iao Stream (Maui), Nuuanu and Kalihi streams (Oahu), Hanalei Bay marine waters (Kauai), and other priority waterbodies in subsequent years.

The 2006 List is shown in Chapter IV – Decision Table; all changes to the 2004 list are graphically highlighted (see table legend) throughout the 2006 List. Waters previously listed on the basis of legacy data or visual assessment will remain on the list until there are sufficient numeric data to validate or invalidate previous listing using listing Priority 1 criteria (see p14, or Appendix A). 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,
- NPDES permitting schedule for facilities that discharge to the waterbody or its upstream tributaries
- relationship with watersheds designated by EPA and DOH as priority areas for achieving measurable water quality improvements

Assignment of Streams into EPA's Five-Part Categorization Scheme

In the process of identifying waters that meet the listing criteria for the Impaired Waters List, DOH was also able to indicate where waters should be placed in the categories recommended in EPA's integrated 303(d)/305(b) guidance (http://www.epa.gov/owow/tmdl/2006IRG/#documents).

(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 or threat is not caused by a pollutant;
(5) Water is impaired or threatened and a TMDL is needed.

Hawaii's Designated Use Attainment and Water Quality Standards Alignment

In general, the water quality criteria and antidegradation requirements of the Hawaii State Water Quality Standards (WQS), Chapter §11-54, are not explicitly associated with the support of particular designated uses. Numeric water quality criteria are assigned by waterbody type, not by designated use. There are no direct links tying the pollutant parameters of the WQS to the designated uses. In limited cases DOH can link certain parameters directly to the uses. These are included in the framework listed below. Refining the WQS to add biological criteria and to methods to evaluate attainment of designated uses within waterbodies may be proposed in future revisions of the WQS and 303(d) listing criteria. The WQS will need significant adjustments to ascertain attainment of designated uses through sampling of conventional and toxic pollutants. Hawaii's WQS revisions are scheduled for evaluation and review on a 3-year cycle and the Integrated 305(b) and 303(d) Report (and Listing Criteria) are required on a 2-year cycle and both are subject to public review and comment.

Logical framework for making waterbody attainment decisions (Rules of Logic):

1. Neither the State Water Quality Standards nor existing state policy explain the relationship between water quality criteria attainment and designated use attainment.
2. Attainment of one or more water quality criterion (including all narrative and numeric criterion) does not establish attainment of one or more designated uses (with exceptions, see below)
3. Non-attainment of a single water quality impairment criterion (including all narrative and numeric criterion) establishes water quality impairment.
4. Categorization designations (waterbody attainment decisions) have the following meanings, and are applied to all waterbodies according to these Rules of Logic (1-4) and the 2004 Priority Ranking and Listing/Delisting Criteria for Hawaii State Surface Waters:
    a. Category 5 - one or more designated use non-attainments or water quality impairments.
    b. Category 4 - one or more designated use non-attainments or water quality impairments.

c. Category 3 - insufficient data for determining designated use attainment and water quality impairment.
d. Category 2 - one or more designated use attainments
e. Category 1 - all designated uses attained

5. Limited Designated use attainment is considered established as follows:

Class 1 uses:

- **recreational purposes - attainment of enterococci criteria (exception to 2. above)**
- **support and propagation of aquatic life - Subsistence fishing use - results of tissue toxicity testing (and human health risk assessment if warranted) or results of bioassessment (including designated reference sites)**
- agricultural and industrial water supplies – undefined parameter combination shipping, and navigation - undefined parameter combination

Class 1.a uses:

- scientific and educational purposes- undefined parameter combination
- **protection of native breeding stock - results of bioassessment (including designated reference sites)**
- baseline references from which human caused changed can be measured - undefined parameter combination
- **compatible recreation - attainment of enterococci criteria (exception to 2. above)**
- aesthetic enjoyment- undefined parameter combination
- other nondegrading uses which are compatible with the protection of the ecosystems associated with waters of this class - undefined parameter combination

Class 1.b uses:

- domestic waters supplies – undefined parameter combination
- food processing – undefined parameter combination,
- **protection of native breeding stock - results of bioassessment (including designated reference sites)**
- **the support and propagation of aquatic life - results of bioassessment (including designated reference sites) and/or results of tissue toxicity testing (and human health risk assessment if warranted)**
- baseline references from which human-caused changes can be measured, - undefined parameter combination
- scientific and educational purposes - undefined parameter combination
- **compatible recreation - attainment of enterococci criteria (exception to 2. above**)
- aesthetic enjoyment- undefined parameter combination

Class 2 uses:

- protection and propagation of fish, shellfish, and wildlife- undefined parameter combination
- **recreation in and on these waters - attainment of enterococci criteria (exception to 2. above)**

Note: Any use - results of Use Attainability Analysis

Classification of the States Waterbodies into EPA Categories

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

Category 2 contains 17 streams that have data that show attainment of some of the water quality standards; however, none of the data sets are complete and/or consistent with the state's listing methodology and WQS. Only two designated uses are directly tied to the WQS, a) human recreational use utilizing the enterococcus standard for attainment and b) native aquatic life support utilizing a biological assessment protocol. Therefore, DOH cannot determine whether each designated use is met. DOH proposes the following inland water bodies to be listed in the Category 2: Pukihae, Kalaoa, Paheehee, Nanue and Hakalau streams on Hawaii Island, Honokohau, Hanawi, Alelele and Kahakuloa streams on Maui, Pelekunu, Wailau and Honouliwai streams on Molokai, Punaluu Stream on Oahu, and Hanakapiai, Limahuli, Wainiha and Waioli streams on Kauai. Although limited numerical data exists for Nanue and Hakalau streams on Hawaii Island, Hanawi and Alelele streams on Maui, Wailau on Molokai, and Hanakapiai and Limahuli streams on Kauai, these streams are included in Category 2 due to their status as reference sites for biological resources as utilized in the Hawaii Stream Bioassessment Protocol (HSBP, 2002), and as such, are deemed to be meeting the designated use of native aquatic life support. No data exists for recreational use attainment decisions for streams.

All of the state's waterbodies fall into Category 3, "data are insufficient to support a decision…" for at least one of the designated uses. DOH reasons that different standards are needed to apply the designated use attainment assertions for all uses inherent in this category. Waterbodies may be cross-categorized into Category 2 and Category 3 if some designated uses are supported but there is insufficient data and/or information to make a support determination for other uses. 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 or use attainments, are sorted into Categories 3 and 5.

Only 4 waterbodies are in Category 4a. Waimanalo and Kawa stream TMDLs have been approved for all listed parameters, and some listed parameters have been approved for the Ala Wai Canal Estuary and Kapaa Stream. As previously mentioned, all Hawaii streams remain in Category 3, the Ala Wai Canal Estuary and Kapaa Stream also have listed parameters not addressed by a TMDL, therefore, they will also retain the Category 5 listing as well. 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 some 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 caused by any pollutant or caused by other factors such as invasive species or water diversions.

Many streams listed in the table have multiple categories assigned. DOH's decision to list waterbodies into several categories stem from the lack of specific standards for some designated uses.

C.2.3. Explanation of Major Changes and Delisting

For streams, all listing/delisting changes were based on the data collected by DOH Clean Water Branch, Hanalei Watershed Hui and/or Windward Community College.

Many changes were initiated to clarify geographical accuracy of the listing and representational data available for analysis. These changes were based on the initial visual assessments performed for the 1998 303(d) List of Impaired Waters. DOH revisited the reports to clarify geographical scope of the assessments and adjusted the Assessment Decision Units (ADUs) accordingly to segregate differing waterbody types and applicable Water Quality Standards (WQS). Please see the sections on decision units, Part C.2., and future direction, Part C.2.4., for more information on geographical scope changes.

Several streams are newly listed as the sampling data of conventional pollutants increases. Many new streams were listed on Kauai on the basis of newly gathered data. Other changes are based on modification/refinement of delineating geographic scope. Please refer to Table 3 for full details.

Of special note on each island:

Hawaii

- Kolekole was entirely delisted based on numerical data that showed attainment of WQS.

Maui

- Ukumehame was delisted for Turbidity (dry season), but was newly listed for Nitrite/Nitrate (dry season).
- Waikapu was newly listed for Turbidity (dry season).

Molokai

- Waialua was newly listed for Turbidity (dry season).

Oahu

- Many new listings for Turbidity and Nutrients (Total Nitrogen, Nitrite/Nitrate, and Total Phosphorus)

Kauai

- New listings for Limahuli, Manoa, Waipa, Hanalei, Kilauea, Moloaa, Papaa, Anahola, Wailua, Hanamaulu, Nawiliwili, Puali, Huleia, Waikomo, Lawai, Wahiawa, Waimea

TABLE 6. Detailed Summary of Changes

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Hawaii					
Halelua	8-1-10		Turb - Wet	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total N - Dry	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total P - Dry	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total N - Wet	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		NO2-NO3 - Wet	New Listing	New numerical Data
Kolekole	8-2-33	Nutrients - Dry (visual)		Delisted	New numerical Data
Kapehu	8-2-37	Kapeha	Kapehu	Modified	Fixed spelling error
Kapehu	8-2-37		NO2-NO3 - Dry	New Listing	New numerical Data
Kaieie	8-2-49	Nutrients - (visual)	Nutrients -Wet (visual)	Modified	New numerical Data removes Dry season component
Kapue	8-2-53		Turb - Dry	New Listing	New numerical Data
Honolii	8-2-56	Nutrients - Dry (visual)		Delisted	New numerical Data
Honolii	8-2-56	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis for listing
Maili	8-2-57		Turb - Dry	New Listing	New numerical Data
Wailuku	8-2-60	Nutrients - Dry (visual)	NO2-NO3 - Dry	Modified	New numerical Data replaces visual basis for listing
Wailoa River	8-2-61	Wailoa River	Waiakea 8-2-61 Wailoa River 8-2-61-E	Modified scope	Remove from Streams listings (brackish water)*
Maui					
Ukumehame	6-1-01		NO2-NO3 - Dry	New Listing	New numerical Data
Ukumehame	6-1-01	Turb - Dry		Delisted	New numerical Data
Waihee	6-2-07	Nutrients - (visual)	Nutrients -Wet (visual)	Modified	New numerical Data removes Dry season component
Waikapu	6-2-10		Turb - Dry	New Listing	New numerical Data
Molokai					
Waialua	4-2-04		Turb - Dry	New Listing	New numerical Data

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Oahu					
Wailele	3-1-08		Turb - Wet	New Listing	New numerical Data
Kahana	3-1-18		NO2-NO3 - Dry	New Listing	New numerical Data
Kahana	3-1-18		Turb - Dry	New Listing	New numerical Data
Waikane	3-2-02		NO2-NO3 - Dry	New Listing	New numerical Data
Waikane	3-2-02		NO2-NO3 - Wet	New Listing	New numerical Data
Waiahole	3-2-04		NO2-NO3 - Dry	New Listing	New numerical Data
Waiahole	3-2-04		Total P - Dry	New Listing	New numerical Data
Kaalaea	3-2-05		Turb - Dry	New Listing	New numerical Data
Kahaluu	3-2-07	3-2-07s	Kahaluu 3-2-07.02 Kahaluu 3-2-07-E	Modified scope	Remove estuary segment from Streams listing*
Waihee	3-2-07.01	Nutrients - (visual)	Nutrients - Wet (visual)	Modified	New numerical Data removes Dry season component
Waihee	3-2-07.01	Nutrients - (visual)	NO2-NO3 – Dry Total N - Dry	Modified	New numerical Data replaces visual basis for listing
Waihee	3-2-07.01		Turb - Dry	New Listing	New numerical Data
Kahaluu	3-2-07.02		NO2-NO3 - Dry	New Listing	New numerical Data
Heeia	3-2-08		Turb - Wet	New Listing	New numerical Data
Heeia	3-2-08		NO2-NO3 - Dry	New Listing	New numerical Data
Heeia	3-2-08		Total N - Dry	New Listing	New numerical Data
Kaneohe	3-2-10		Turb - Dry	New Listing	New numerical Data
Kapaa/Kawainui	3-2-13*	3-2-13s	K. Stream 3-2-13 Kapaa Stream 3-2-13-Kapaa K. Marsh 3-2-13-W	Modified	Clarifies geog scope of prior listing
Maunawili	3-2-13.01	3-2-13	3-2-13.01	Modified	Clarifies geog scope of prior listing
Kapaa	3-2-13*		Lead	New Listing	New numerical Data
Palolo	3-3-07.01.1	3-3-07s	3-3-07.01.1	Modified	Clarifies geog scope of prior listing
Nuuanu	3-3-09		NO2-NO3 - Dry	New Listing	New numerical Data
Nuuanu	3-3-09		Total P - Dry	New Listing	New numerical Data
Nuuanu	3-3-09		TSS - Dry	New Listing	New numerical Data
Nuuanu	3-3-09	Turb (visual)	Turb - Dry	Modified	New numerical Data
Nuuanu	3-3-09	Turb (visual)	Turb - Wet	Modified	New numerical Data

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Oahu – cont.					
Moanalua	3-3-12	3-3-12	3-3-12-01	Modified	Clarifies geog scope of prior listing
Moanalua	3-3-12	Nutrients - (visual)	Total N - Dry	Modified	New numerical Data
Moanalua	3-3-12	Nutrients - (visual)	Total N - Wet	Modified	New numerical Data
Moanalua	3-3-12	Turbidity - (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis for listing
Aiea	3-4-03		Total N - Wet	New Listing	New numerical Data
Aiea	3-4-03		NO2-NO3 - Wet	New Listing	New numerical Data
Kalauao	3-4-04		Total N - Dry	New Listing	New numerical Data
Kalauao	3-4-04		NO2-NO3 - Dry	New Listing	New numerical Data
Kalauao	3-4-04		Turb - Dry		
Waiawa	3-4-06	Nutrients - (visual)	Nutrients - Dry (visual)	Modified	New numerical Data removes Wet season component
Waikele	3-4-10	Nutrients - (visual)	NO2-NO3 - Dry	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	Total N - Dry	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	NO2-NO3 - Wet	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	Total N - Wet	Modified	New numerical Data
Kiikii	3-6-06	3-6-06s	Poamoho 3-6-06.01 Kaukonahua 3-6-06.02 Kiikii 3-6-06-E	Modified scope	Remove from Streams listings (brackish water)*
Poamoho	3-6-06.01	3-6-06s	Nutrients - (visual) Turb - (visual)	Modified	Clarifies geog scope of prior listing
Kaukonahua	3-6-06.02	Nutrients - (visual) 3-6-06s	NO2-NO3 - Dry Total N - Dry Turb - Dry	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for listing.
Kaukonahua	3-6-06.02	Nutrients - (visual) 3-6-06s	NO2-NO3 - Wet Total N - Wet Turb - Wet	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for listing.
Wahiawa Reservoir	3-6-06.02-R*	3-6-06s	3-6-06.02-R*	Modified scope	Clarifies geog scope of prior listing
S. Fork Kaukonahua	3-6-06.02.1*	3-6-06s	3-6-06.02.1*	Modified scope	Clarifies geog scope of prior listing
N. Fork Kaukonahua	3-6-06.02.2*	3-6-06s	3-6-06.02.2*	Modified scope	Clarifies geog scope of prior listing
Paukauila	3-6-07	3-6-07s	Helemano 3-6-07.01 Opaeula 3-6-07.02 Paukauila 3-6-07-E	Modified scope	Remove from Streams listings (brackish water)*

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
KAUAI					
Anahulu	3-6-08	3-6-08s	Kawailoa 3-6-08.01 Anahulu 3-6-08-E	Modified scope	Remove from Streams listings (brackish water)*
Limahuli	2-1-12		NO2-NO3 - Dry	New Listing	New numerical Data
Manoa	2-1-13		Turb - Dry	New Listing	New numerical Data
Manoa	2-1-13		Turb - Wet	New Listing	New numerical Data
Waipa	2-1-17		Turb - Dry	New Listing	New numerical Data
Hanalei	2-1-19	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis listing
Hanalei	2-1-19	Enterococci		New Listing	New numerical Data
Kilauea	2-1-28		Turb - Dry	New Listing	New numerical Data
Moloaa	2-1-34		Turb - Dry	New Listing	New numerical Data
Moloaa	2-1-34		Turb - Wet	New Listing	New numerical Data
Papaa	2-1-35		Total N - Dry	New Listing	New numerical Data
Papaa	2-1-35		NO2-NO3 - Dry	New Listing	New numerical Data
Papaa	2-1-35		Turb - Dry	New Listing	New numerical Data
Anahola	2-2-01		Turb - Dry	New Listing	New numerical Data
Anahola	2-2-01		Turb - Wet	New Listing	New numerical Data
Kapaa	2-2-04	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis listing
Wailua	2-2-08		Turb - Dry	New Listing	New numerical Data
Hanamaulu	2-2-12		Turb - Dry	New Listing	New numerical Data
Nawiliwili	2-2-13		NO2-NO3 - Dry	New Listing	New numerical Data
Nawiliwili	2-2-13		Total N - Dry	New Listing	New numerical Data
Puali	2-2-14		NO2-NO3 - Dry	New Listing	New numerical Data
Puali	2-2-14		Total N - Dry	New Listing	New numerical Data
Puali	2-2-14		Turb - Dry	New Listing	New numerical Data
Puali	2-2-14		Total N - Wet	New Listing	New numerical Data
Puali	2-2-14		Turb - Wet	New Listing	New numerical Data
Huleia	2-2-15		NO2-NO3 - Dry	New Listing	New numerical Data
Huleia	2-2-15		Total N - Dry	New Listing	New numerical Data
Huleia	2-2-15	NO2-NO3 - Wet		Delisted	New numerical Data
Waikomo	2-3-02		Total N - Dry	New Listing	New numerical Data

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
KAUAI – cont.					
Waikomo	2-3-02		NO2-NO3 - Dry	New Listing	New numerical Data
Waikomo	2-3-02		Turb - Dry	New Listing	New numerical Data
Waikomo	2-3-02		Total N - Wet	New Listing	New numerical Data
Waikomo	2-3-02		NO2-NO3 - Wet	New Listing	New numerical Data
Waikomo	2-3-02		Turb - Wet	New Listing	New numerical Data
Lawai	2-3-04		Total N - Dry	New Listing	New numerical Data
Lawai	2-3-04		Turb - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Total N - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		NO2-NO3 - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Turb - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Total N - Wet	New Listing	New numerical Data
Wahiawa	2-3-06		NO2-NO3 - Wet	New Listing	New numerical Data
Wahiawa	2-3-06		Turb - Wet	New Listing	New numerical Data
Waimea	2-4-04s	2-4-04s	Waimea Stream 2-4-04 Waimea Est. 2-4-04-E*	Modified	Remove from Streams listings (brackish water)*
Waimea	2-4-04	Turb - (visual) (2-4-04s)	Turb - Dry	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for Dry season listing.
Waimea	2-4-04	Turb - (visual) (2-4-04s)	Turb - Wet (visual)	Modified	Clarifies geog scope of prior listing. Visual basis for Wet season listing remains.
Waimea	2-4-04		NO2-NO3 - Dry	New Listing	New numerical Data

*****Waterbody IDs follow the Hawaii Stream Assessment (HSA) Coding System (Hawaii Cooperative Park Service Unit, 1990).
In HSA Coding System, code suffix "s" identifies "stream system," which by DOH definition (HAR 11-54) includes estuaries.
Thus all "s" codings are removed from the freshwater codings in the 2006 Integrated Report.
Codings marked by an asterisk (*) in this table require clarification and modification not available in the 1990 HAS publication.
Please see the Freshwater Decision Units Rationale for further discussion of waterbody delineation, naming, coding, and georeferencing conventions.

C.2.4. Future Direction

Decision Units

The evolving framework for defining and georeferencing attainment decision units, waterbody segments, and NHD reaches for fresh inland Hawaii waters must have a foundation of hydrologic and regulatory truth. How we build upon this foundation is determined by our information management technology and skills and our water quality monitoring capacity and strategy. To build upon this foundation during upcoming assessment cycles, we will continue (1) modifying our watershed and waterbody delineation and coding systems to better incorporate and reflect hydrologic and regulatory truth; (2) improving our information management technology and procedures to facilitate data integration and georeferencing; (3) expanding our monitoring capacity to generate more, higher-quality data; and (4) developing our comprehensive surface water quality monitoring strategy to guide our use of this monitoring capacity for making the best possible attainment decisions while also achieving our other monitoring objectives.

The following discussion of this framework marks the current status of these efforts. Priorities for the next assessment cycle (2008 Integrated Report) include (1) completing modifications to watershed delineations and the watershed coding system; (2) beginning a comprehensive inventory of all fresh inland waterbodies, including the modification of waterbody delineation and coding protocols to be used in the inventory process; (3) completing revisions to our Quality Assurance Program Plans for surface water monitoring and analysis; and (4) updating the Comprehensive Surface Water Quality Monitoring Strategy to focus the results of these efforts on our monitoring needs and monitoring plans for attainment decision-making.

NHD reaches for fresh inland Hawaii waterbodies are intended to represent a combination of hydrologic and regulatory truth and are defined from confluence to confluence within a single waterbody type (type as established by water quality standards). For the purpose of NHD reach indexing, confluences include (a) the intersection of two or more sections (e.g. tributaries, forks, branches, arms) of a waterbody (single type) and (b) the intersection of two or more waterbodies of different types (e.g. "intermittent stream" and "perennial stream," "ditch" and "perennial stream," "spring" and "wetland"). However, intersections of fresh inland waterbodies with various (i) outfalls, (ii) other discharge structures, and (iii) overland and subsurface flow paths, where these (i, ii, and iii) are principally designed or functioning to convey storm runoff and ephemeral subsurface flow into fresh inland waterbodies, are not considered confluences. A single NHD reach is regulated by one or more water quality standards (see **Waterbody segments** below).

Waterbody segments for fresh inland Hawaii waterbodies are intended to represent regulatory truth and are defined as the portion of a single NHD reach that is regulated by a single water quality standard (meaning that it is within a single waterbody type and class). Because waterbody class is defined solely by underlying State Land Use classification, a single NHD reach may span part or all of one or more waterbody segments (and thus may be regulated by one or more water quality standards). A single waterbody segment may form all or part of an attainment decision unit, and a single attainment decision unit may include one or more waterbody segments.

TABLE 7. Descriptive Information for Each Waterbody Segment

Waterbody type[1]	Segment				
	Identifier[2]	type	size and unit of measurement	name or location on NHD	designated uses
Flowing seep	TBD	same as waterbody type	TBD	TBD	defined by segment's waterbody class (1.a., 1.b., or 2.) for all waterbody types
Flowing spring	TBD		TBD	TBD	
Elevated wetland	TBD		ha	TBD	
Low wetland	TBD		ha	TBD	
Intermittent stream	HSA stream code		m	Name_ Reach ID	
Perennial stream	HSA stream code		m	Name_ Reach ID	
Natural freshwater lake	Name/class		ha	Name	
Freshwater impoundment	Name/class		ha	Name	
Reservoir	Name/class		ha	Name	
Ditch	TBD		m	TBD	
Flume	TBD		m	TBD	
Drainage ditch	TBD		m	TBD	
Canal	TBD		m	TBD	

[1]See Chapter IV for explanation of waterbody types.
[2]Other coding systems that may be used/adapted include State of Hawaii Department of Land and Natural Resources Division of Aquatic Resources codes for streams and reservoirs.
TBD = To Be Determined

Monitoring and Assessment

Many of the data sets analyzed in this report provided insufficient quantity for listing/delisting decisions. Although this information was inadequate for DOH purpose of decision-making, it should be publicly reported. The data within this report denoted as a question mark (?), reflect the fact that some data do exist, but not enough for the decision-making process. Waterbodies not listed in Chapter IV reflect that no data was available.

Future sampling should focus on eliminating the legacy visual listings (**V**) persistent within this report. The ultimate goal is that all parameters are classified as Priority 1, and assigned not attained (**N**) or attained (**A**) designation. This would also include clarifying the Priority 2a and 2b sample sets of combined season data and the data sets between 5 and 10 where the resulting geomean is twice the standard. Concurrently, the next targeted group should be the waterbodies that have question marks (?). These waterbodies are identified as needing more data and should be sampled in the future. Waterbodies not on this listing at all, denote no data have been collected for assessment purposes, and sampling should begin. (These waterbodies should be listed in Chapter IV and identified for future monitoring.) Waterbodies need to be rotationally included to ensure enough data is available within the floating 6-year window. Careful scheduling should allow for this targeted approach.

Additionally, in the future, Water Quality Standards need to be modified to ascertain designated use attainment with less time and financial resource input. Current standards identify general biological

criteria and a more encompassing assessment of biological assemblages should gather more relevant data to determine whether designated uses are being attained. These modifications are subject to public comment and review and will be a long-term goal to bring the WQS into alignment with federal expectations.

C.3. Wetlands Program

Responsibilities for wetland protection are diffused among various federal, state, and county authorities. There is no formal wetlands program in the DOH.

C.4. Trends Analysis for Surface Waters

There were no readily available trends analysis computations for surface waters in Hawaii, and none have been developed by DOH.

C.5 Public Health Issues

Leptospirosis Threat

Leptospirosis is not included as a specific water quality standard parameter. However, all freshwaters within the state are considered potential sources of Leptospirosis infection by the epidemiology section of the Hawaii State Department of Health. No direct tests have been approved or utilized to ascertain the extent of the public health threat through water sampling. Epidemiologic evidence has linked several illness outbreaks to contact with freshwater, leading authorities to issue blanket advisories for all fresh waters of the state.

Fish Consumption Advisory

Several locations have been identified and posted as areas where fish and shellfish should not be consumed. These areas include: Pearl Harbor, Ala Wai Canal and urban streams of Honolulu. Contamination of fish and shellfish include organochlorine pesticides and/or PCBs and lead.

PART D. GROUND WATER MONITORING AND ASSESSMENT

Ground water is reported in a Chapter III attached in this report.

PART E. PUBLIC PARTICIPATION

Ongoing informal public contact is a persistent component of DOH's strategy. This report is a formal expression of the reporting requirements of the Clean Water Act. This report followed a regime of the standard public participation schedule. The first step consisted of the published formal call for data. This was accomplished on October 2, 2005 in 7 newspapers on all islands throughout the state. The final date for data submission was November 1, 2005. Additional public contact was made through e-mail and phone conversations to potential contributors of data and through e-mail broadcasts to e-lists of environmental professionals.

A public notice and draft report were published December 18, 2006, and a 30-day comment period ended January 19, 2007. Public comments were evaluated, related edits to the report were completed, and a Response to Comments document was published. The entire package was approved by the Deputy Director, Environmental Health Administration and submitted to the U.S. EPA for approval.

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