Alaska's FINAL 2012 Integrated Water Quality Monitoring and Assessment Report

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Alaska
Department of Environmental Conservation

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List of Abbreviations and Acronyms

µg/L	micrograms per liter
AAC	*Alaska Administrative Code*
ACWA	Alaska Clean Water Actions
ADF&G	Alaska Department of Fish and Game
APDES	Alaska Pollutant Discharge Elimination System
ARWA	Alaska Rural Water Association
ATTF	Alaska Timber Task Force
BEACH	Beaches Environmental Assessment and Coastal Health
BMP	best management practice
BOD5	5-day biochemical oxygen demand
BTEX	benzene, toluene, ethylbenzene, and xylenes
DEC	Alaska Department of Environmental Conservation
CBS	City and Borough of Sitka
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
cm	centimeter
CWA	Clean Water Act
CWS	Community Water System
CZARA	Coastal Zone Act Reauthorization Amendments
DNR	Alaska Department of Natural Resources
DO	dissolved oxygen
DRO	diesel-range organics

DWP	Drinking Water Protection
EPA	U.S. Environmental Protection Agency
FC	fecal coliform
GP	General Permit
GPS	global positioning system
GRO	gasoline-range organics
LTF	log transfer facility
LSA	log storage area
MCL	maximum contaminant level
mgd	million gallons per day
ml	milliliter
MMS	Minerals Management Service, now known as Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)
NCA	National Coastal Assessment
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NTNCWS	Non-transient, Non-community Water System
PAH	polynuclear or polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PWS	public water system
PWSS	Public Water System Supervision
QAPP	quality assurance project plan
ROD	record of decision
SDWA	Safe Drinking Water Act

SDWIS	Safe Drinking Water Information System
SFY	State Fiscal Year
SPAR	DEC's Division of Spill Planning and Response
SQuiRTS	NOAA Screening Quick Reference Tables
STORET	STOrage and RETrieval, an EPA environmental database
SVE	soil vapor extraction
TAH	total aromatic hydrocarbon
TCE	trichloroethylene
TDS	total dissolved solids
TMDL	total maximum daily load
TNCWS	Transient Non-community Water System
TOC	total organic carbon
TSAIA	Ted Stevens Anchorage International Airport
TSS	total suspended sediment
UIC	underground injection control
USACE	U.S. Army Corps of Engineers
USF&WS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WFLHD	Western Federal Lands and Highway Division
WPMP	Wellhead Protection Management Plan
WQS	water quality standards
WSA	Wadeable Streams Assessment
ZOD	Zone of Deposit

1 Introduction

The Purpose of the 2012 Integrated Water Quality Assessment Report

The Clean Water Act (CWA) mandates that each state develop a program to monitor and report on the quality of its surface and groundwaters and prepare a report describing the status of its water quality. The U.S. Environmental Protection Agency (EPA) then compiles and summarizes the information and sends this information in a report to Congress. The process for developing information on the quality of the nation's water resources is contained in several sections of the CWA. Most prominent are Section 305(b), which requires that the quality of all waterbodies be characterized, and Section 303(d) which requires that states list any waterbodies that do not meet water quality standards (WQS). The Alaska WQS are documented in Title 18, Chapter 70, of the *Alaska Administrative Code* (18 AAC 70). EPA has recommended that the Section 305(b) reports and the Section 303(d) list of impaired waters be integrated into a single, comprehensive monitoring and assessment report, the Integrated Water Quality Monitoring and Assessment Report (Integrated Report).

This integrated approach allows each state to identify any water quality problems, develop remediation plans, and ultimately, achieve WQS in all of its waters. The Alaska Department of Environmental Conservation (DEC) considers the Integrated Report an important tool for understanding the health of Alaska's waters and identifying actions that can be taken to improve water quality in Alaska. Water quality information is one component that contributes to the efforts and priorities under the Alaska Clean Water Actions (ACWA) initiative, a much broader and more comprehensive assessment that includes water quality, water quantity, and aquatic habitat. More detailed descriptions of the ACWA initiative and its process for assessing information and establishing waterbody priorities are available in Section 2 and Appendix F.

The 2012 Integrated Report is a statewide water quality assessment. It describes whether the existing condition of each Alaska waterbody is sufficient to maintain multiple designated uses of that waterbody. Alaska WQS designate seven uses for fresh waters (drinking water; agriculture; aquaculture; industrial; contact recreation; non-contact recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife) and seven uses for marine waters (aquaculture; seafood processing; industrial; contact recreation; non-contact recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting raw mollusks or other raw aquatic life for human consumption). Sources of information used by DEC to develop the biannual water quality assessment include monitoring data (e.g., water testing), professional knowledge, and evaluations such as those provided by water resource managers, fish and wildlife biologists, and aquatic biologists.

This Integrated Report fulfills the CWA Section 305(b) requirement that each state provide a comprehensive report of water quality to EPA. The report documents a comprehensive evaluation of the status and health of each waterbody in the State of Alaska and describes state programs for maintaining or improving the quality of Alaska's waters.

In addition, this report describes the process for evaluating whether waterbodies attain WQS or are impaired (polluted). This process includes classifying each waterbody according to five categories, depending on their health; determining which waterbodies need further action; scheduling when each (Category 5) impaired waterbody will be addressed; involving the public in determining how water quality will be addressed; and determining how waterbodies are removed from the impaired waterbody list.

DEC water quality programs are described in Appendix F.

Assessment Results

Alaska is rich in water quantity, water quality, and aquatic resources; almost half of the total surface waters of the United States are located within the state. Because of the size, sparse population, and remote character of Alaska, the vast majority of its water resources are in pristine condition. More than 99.9% of Alaska's waters are considered unimpaired. Among the state's vast water resources are more than 3 million lakes, 714,000 miles of streams and rivers, 44,000 miles of coastline, and approximately 174,683,900 acres of wetlands. While Alaska's probabilistic survey assessments conducted by the AK Map program have only evaluated less than 1% of the states freshwater resources and completed initial surveys of 3 of the 5 major coastal provinces, less than 0.1% of these water resources have been identified as impaired. Historically, Alaska's water quality individual assessments have focused on areas with known or suspected water quality impairments. Appendix A provides detailed information about the individual assessments and Appendix F provides information about the probabilistic assessment program. The table below provides information about Alaska.

Table 1: Alaska Quick Facts

Atlas – Topic	**Value**	**Value**
State population		710,231 [a]
State surface area (square miles)		656,425
Total miles of rivers and streams		714,004
Number of lakes/reservoirs/ponds		3,000,000+
Acres of lakes/reservoirs/ponds		12,787,200
Miles of coastal shoreline		44,000
Wetland Acreages [b]		
Palustrine –non-tidal: muskegs, bogs, forested wetlands, tundra, open water	172,503,400	
Estuarine—bays, salt marshes, beaches	2,131,900	
Marine intertidal—ocean shoreline	48,600	
Total wetland acres		174,683,900

Notes:
a. US Census Bureau National and State Population Estimates, September 2010 http://quickfacts.census.gov/qfd/states/02000.html
b. U.S. Fish and Wildlife Service, Cowardin Classification of Wetlands and Deepwater Habitat, 1979

In Alaska, surface fresh water supplies three-fourths of water needed for industry, agriculture, mining, fish processing, and public water use and is used for about half of the domestic water supply. Alaska's surface waters include more than 15,000 salmon streams, an important resource for Alaskans and the world. Alaska also has the largest groundwater resources of any state.

Alaska is sparsely populated, having approximately 710,000 residents (approximately one resident per square mile). Urban development is concentrated in a few main population centers, and the majority of people live in Southcentral Alaska. The 2010 U.S. Census showed a 13% population increase since the previous census in most areas of the state. Almost 50% of the state's population lives in the Municipality of Anchorage in Southcentral Alaska. The other major population centers are Juneau, the state capital, in Southeast Alaska, and Fairbanks in Interior Alaska. Communities outside these major population centers tend to be small and generally not connected by roads.

As population grows and the natural resource-based economy expands in Alaska, an increasing number of state waters, especially in urban areas, face the threat of degradation. In specific localized parts of Alaska, surface water quality has been impaired. Waters in urban settings (cities, towns, and villages) are predominantly impaired from sediment, turbidity, and fecal coliform (FC) bacteria contamination caused by urban and stormwater runoff. Other sources of impairment are sediment and turbidity from mining activities in Interior Alaska, residues from seafood processing facilities in coastal zones, contaminated military sites in Southcentral and Southwest Alaska, and bark and wood residues from timber processing and transfer facilities in coastal Southeast Alaska. Petroleum products, such as from motorized watercraft, oil spills, or fuel leaks, are also sources of impairment within the state.

Waterbody Categories

Generally, waterbodies are assigned to categories by the degree to which water quality goals are attained. The five categories and three subcategories are described below:

- **Category 1.** All WQS criteria uses are attained.
- **Category 2.** Some WQS criteria are attained, but data and information to determine whether the WQS for the remaining uses are attained are insufficient or absent.
- **Category 3.** Data or information is insufficient to determine whether the WQS for any designated uses are attained.
- **Category 4.** The waterbody is determined to be impaired but does not need a total maximum daily load (TMDL).
    - **Category 4a.** An established and EPA-approved TMDL exists for the impaired water.
    - **Category 4b.** Requirements from other pollution controls have been identified to meet WQS for the impaired water.
    - **Category 4c.** Failure to meet a water quality standard for the impaired water is not caused by a pollutant; instead, the impairment is caused by a source of pollution such as nuisance aquatic plants, degraded habitat, or a dam that affects flow.

- **Category 5.** WQS are not attained for one or more criteria and the waterbody requires a TMDL or recovery plan. Category 5 waters are those waters identified on the Section 303(d) list of impaired waters.

The following table summarizes the number of waterbodies in each category as determined by the evaluation of existing and readily available water quality data and information reviewed for this draft 2012 Integrated Report.

Table 2: Number of Waterbodies

Category	Number of Waterbodies
1	Majority of Alaskan waters
2	48
3	327
4a	37 (for 44 impairments)
4b	3
4c	0
5	24

Alaska's Approach to Impaired Waterbodies

Alaska's process for listing an individual waterbody for failure to meet WQS, as required in the CWA Section 303(d), begins with an internal review of existing and new information to determine (1) the presence of pollutants, (2) whether persistent exceedances of WQS are occurring, (3) whether impacts on the designated uses are occurring, and (4) the degree to which WQS and the other criteria are attained. The specific criteria used for evaluation and listing of waterbodies associated with residue discharges from log transfer or seafood processing facilities are found in Appendixes G and I.

When a waterbody is placed on the Section 303(d) list, a TMDL or recovery plan is developed, unless data obtained after the listing indicate that the waterbody is no longer impaired or other measures are undertaken to restore the waterbody. State of Alaska waterbodies on the Section 303(d) list are scheduled for development of a TMDL (see Appendix C) or waterbody recovery plan between now and 2017. Specific criteria apply for delisting of impaired waterbodies in Section 2, and Appendices G and I.

When a TMDL or waterbody recovery plan is developed, a public process is initiated. As part of the process, the public is notified of the document and can comment on it.

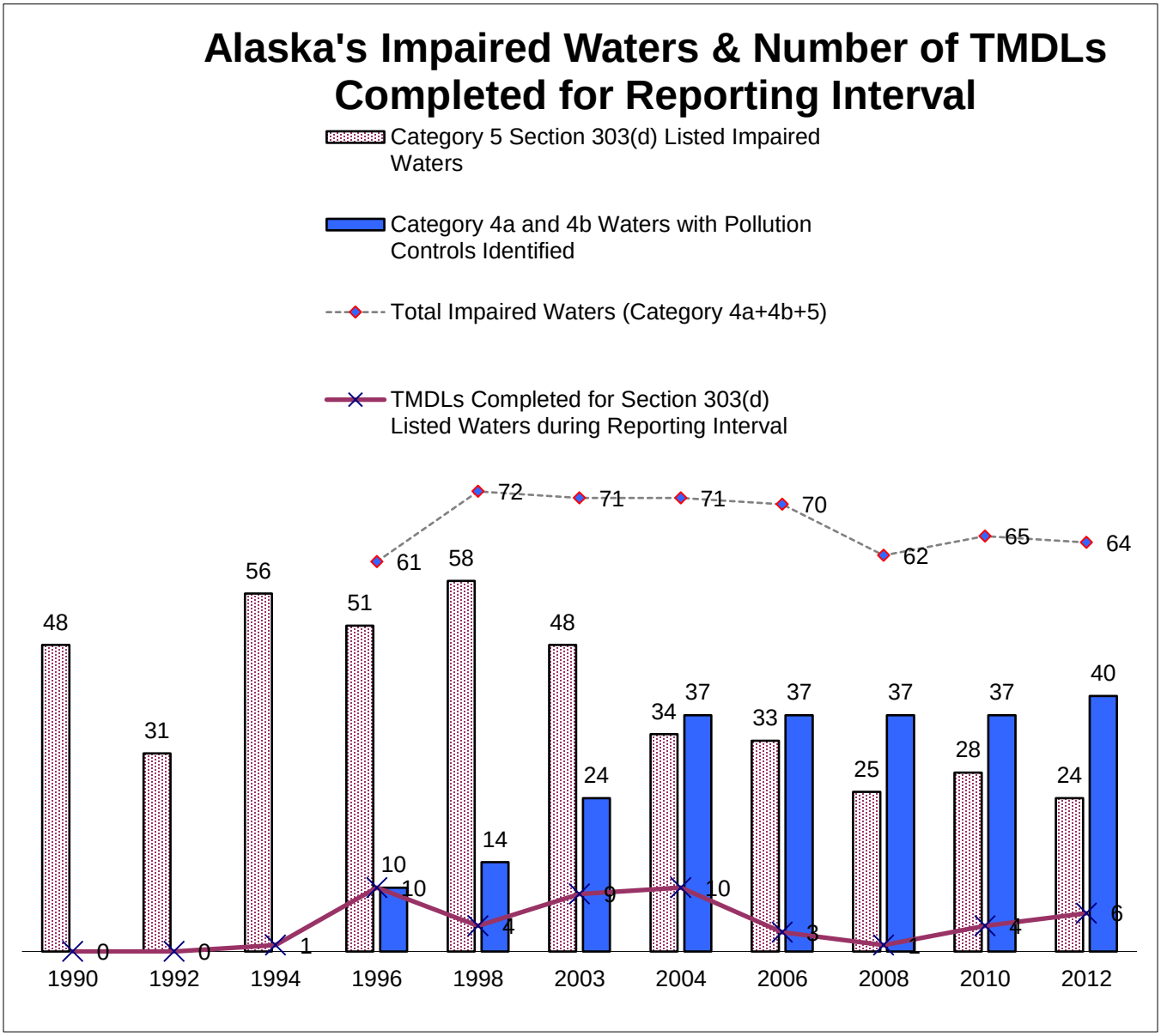

Figure 1 Alaska's Impaired Waters & Number of TMDLs Completed for Reporting Interval

Significant Changes from Alaska's 2010 Integrated Water Quality Assessment Report

This 2012 Integrated Report documents the following water quality impairment changes from the 2010 Integrated Report:

Three waters are now attaining standards in Category 2:

- East Port Frederick, near Hoonah, where the marine water is meeting the residues standard.

- Eyak Lake, Cordova, where the water is meeting the petroleum hydrocarbons standard.
- Fubar Creek on Prince of Wales Island, where the water is meeting the sediment standard.

Six impaired waters are now under a plan in Category 4:

- Big Lake, near Wasilla, is now in Category 4a, because a TMDL has been developed for petroleum hydrocarbons.
- Dutch Harbor, near Unalaska, is now in Category 4a, because a TMDL has been developed for petroleum hydrocarbons.
- Iliuliuk Harbor, near Unalaska, is now in Category 4a, because a TMDL has been developed for petroleum hydrocarbons.
- Noyes Slough, in Fairbanks, is now in Category 4a, because a TMDL has been developed for petroleum hydrocarbons.
- Red Lake Anton Road Pond, in now in Category 4a, because a TMDL has been developed for metals (iron and manganese).
- Skagway Harbor, at Skagway, is now in Category 4a, because a TMDL has been developed for petroleum hydrocarbons. Also, as part of the TMDL data collection efforts the east harbor (small boat harbor area) was found to be attaining water quality standards.
- Tongass Narrows, Ketchikan Harbor, is now in Category 4b, because a waterbody recovery plan (4b) has been developed for seafood residues.

Three new waters are placed in Category 5/Section 303(d) impaired list:

- Hawk Inlet, NW Admiralty Island, where a small portion of the marine sediment is impaired from cadmium, copper, lead, mercury, and zinc.
- Kimshan Cove, west Chichagof Island, where the marine sediment is impaired from arsenic, copper, lead, and mercury.
- Stampede Creek, Denali National Park and Preserve, where the water is impaired from antimony.

Four modifications of waters with impairments are proposed:

- Akutan Harbor in the Aleutians – This water is no longer impaired from dissolved gas (low dissolved oxygen) but remains in Category 4a as impaired for residues with a TMDL.
- Ship Creek in Anchorage – This water is no longer impaired from petroleum hydrocarbons but remains in Category 4a as impaired from fecal coliform bacteria with a TMDL.
- Slate Creek in Denali National Park and Preserve – This water is no longer impaired from turbidity but has been determined to be impaired from antimony and arsenic.
- Skagway Harbor in Skagway – This water is no longer impaired from metals but has been determined to be impaired from petroleum hydrocarbons with a TMDL. As part of the

TMDL data collection efforts the east harbor (small boat harbor area) was found to be attaining water quality standards.

Other broader changes reflected in the 2012 report include the following:

- 21 new waterbodies are reported in Category 3 because waters were added to the DEC water quality assessment database, which now identifies 326 waterbodies in Category 3.
- Narratives were updated based on existing and readily available information. Updates to Category 4a waterbody narratives were completed to describe development of TMDLs.
- ACWA waterbody priority rankings are included in Appendix H.
- Some descriptions of water quality management programs were updated in Appendix F.

Public Process Overview

DEC has an open, ongoing solicitation for water quality data and information. To solicit ACWA waterbody nominations, DEC coordinates a continuous effort among state resource agencies. During the preparation and development of Alaska's 2012 Integrated Report, DEC actively solicited readily available and existing water quality data and information for use in preparing the report.

DEC posted a public notice solicitation for existing and readily available water quality data and information from August 1 to September 14, 2011.

DEC will consider public comments on the public notice draft of the report and make necessary changes to the final report. DEC will prepare a responsiveness summary on the public comments received on the draft report and information received during the solicitation and makes it available to the pubic via web posting. DEC will then forward the proposed final report to EPA who has approval authority over the Section 303(d) list of impaired waters.

2 Description of Categories and Overview of Assessment Methodology and Results

This section of the Integrated Report describes the process used by the State of Alaska to evaluate the nature, health, and status of waterbodies. This evaluation process includes assigning waterbodies into five categories, depending on their health; determining which waterbodies need further action; scheduling when each polluted or impaired (Category 5) waterbody will be addressed; and involving the public in determining how waterbodies will be addressed. (Figure D-1, Logic Flow Diagram for Making Category Determinations, in Appendix D portrays the logic of assigning waterbodies to categories.)

Section 303(d) requires a list of impaired waterbodies that are not expected to meet standards without additional controls. Section 303(d) requires that for waterbodies found to be impaired or polluted, a TMDL must be conducted and implemented. Alternatively, a waterbody recovery plan can be developed and the water is placed in Category 4b. Many Section 303(d) listed waters have not undergone comprehensive water quality assessments to determine the extent of water quality impairment or whether existing controls are adequate to achieve the standards. When waterbodies are elevated to the department's attention DEC closely scrutinizes waterbodies to determine whether suspected water quality violations or persistent exceedances of WQS have been thoroughly investigated and documented. Careful review by DEC is intended to prevent the listing of waterbodies with inconclusive or circumstantial data or solely on the basis of observation.

General Assessment Methods

DEC actively solicits all existing and readily available water quality data and information in accordance with EPA guidance at http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/guidance.cfm

The information gathered is not limited to waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions. Organizations and groups are contacted for research they may be conducting or reporting. University researchers, the U.S. Department of Agriculture, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the U.S. Fish and Wildlife Service (USF&WS) are examples of such sources of field data.

DEC actively accepts and solicits water quality data and information on a continuous basis. Additionally, formal public notice that such information is sought is made every two years as part of developing the Integrated Report.

DEC considers and evaluates data and information from a wide range of sources, such as those listed below:

- Previous reports prepared to satisfy CWA Sections 305(b), 303(d), and 314 and any updates.
- Reports of ambient water quality data, including those prepared as part of state ambient water quality monitoring programs, complaint investigations, information generated by the public and other sources that provide readily available data (e.g., STORET, an EPA environmental database), and data and information provided in public comments.
- Reports of dilution calculations or predictive models.
- Water quality management plans.
- Records of decision (RODs) for Superfund (contaminated) sites.
- Safe Drinking Water Act (SDWA) source water assessments.
- DEC Contaminated Sites database.

In addition to these conventional sources of data, DEC also considers water quality data and information from citizen volunteer monitoring networks.

General Considerations for All Waterbody Categories

The following subsections describe data quality and quantity considerations addressed by DEC when evaluating a water for inclusion in, or removal from, impaired waters categories (Category 4a, Category 4b, and Category 5) or in making an attainment determination.

Data Quality Considerations

DEC considers whether typical elements of a quality assurance project plan (QAPP) are submitted for water quality data and information. A QAPP checklist for sampling, a QAPP review checklist, and a description of elements that characterize a good QAPP are available on the DECs web site at http://www.dec.state.ak.us/water/wqapp/wqapp_index.htm.

Water quality data and information that is collected and submitted without a QAPP or that uses a QAPP for which the level of confidence is weak will not be relied on to make an impairment determination. Such data and information may only be considered as ancillary information to support an attainment or impairment determination.

Data Quantity Considerations

Adequate data quantity is necessary to make well-grounded attainment and impairment decisions. Assessments based on larger sample sets are preferred because they are more likely to yield accurate conclusions than assessments based on smaller sample sets.

Enough data or information should be available to indicate that standards are or are not exceeded, or that uses are or are not impaired, and that such measurements are representative of the waterbody.

Categories and Assessments

Category 1 – WQS Attained for All Uses

Waterbodies are placed in this category if data are available to support a determination that all WQS criteria are attained.

Criteria Used to Classify a Waterbody as Category 1

The majority of Alaska's waters are not subject to human-caused stressors and are considered unimpaired. DEC expects that 99.9% of Alaska's waters can be classified as Category 1; however, no specific waters are identified in this category.

Category 2 – WQS Attained for Designated Uses

Waterbodies are placed in this category if some of the WQS criteria are attained.

Waterbodies are placed in Category 2 if data and information are available to support a determination that some, but not all, criteria are attained and if the attainment status for the remaining criteria is unknown because there is insufficient or no data or information. These waters are presumed to be attaining all criteria. Additional monitoring of these waters is scheduled when new information becomes available that would indicate a change in the status or significant cause for concern. The 48 waterbodies assigned to Category 2 are identified in Appendix A.

Criteria Used to Classify a Waterbody as Category 2

Waterbodies that have been previously identified as impaired but are now attaining a water quality criteria are placed in this category. Examples are a water for which recent monitoring data support a determination that the criteria is attained.

Waterbodies associated with residue discharges are also placed in Category 2 if recent dive survey reports show that WQS criteria are attained and have continued to be attained.

Waterbodies that were determined to be impaired from residues and listed as Category 5 but have a documented continuous coverage of residues of less than 1.0 acre are also placed in Category 2 and are identified in Appendix A.

Category 3 – Data or Information Insufficient

Waterbodies are placed in Category 3 if data or information are insufficient to determine whether the WQS criteria are attained.

An additional 21 waterbodies have been identified for placement in Category 3 since the 2010 Integrated Report. The 327 Category 3 waterbodies are identified in Appendix A.

Criteria Used to Classify Waterbodies as Category 3

Alaska's water resources include more than 3 million lakes larger than 5 acres in size, 714,004 miles of rivers and streams, more than 175 million acres of fresh water wetlands, and 44,000 miles of coastal shoreline. Because of the size of its water resources, Alaska has insufficient, inadequate, or little to no data or information to support attainment or impairment determinations for many waterbodies. DEC expects that the majority of these waters would be assigned to Category 1—waters attaining standards for all uses—if DEC had information available to assess them.

Category 3 includes waters DEC formerly called "open files" and waters nominated for assessment through the ACWA process of Alaska's three resource agencies: DEC, Alaska Department of Fish and Game (ADF&G), and Alaska Department of Natural Resources (DNR). Actions that trigger opening a file can include nomination from the public, a public complaint, a newspaper report, or more rigorous information such as water quality reports or assessments. For many of these waters, definitive water quality data or information to determine whether water uses are being attained or impaired is lacking, scant, spotty, or outdated. Many of these waters have been brought to the attention of Alaska's state resource agencies for suspected pollution or for impairment of water quantity or fish habitat. DEC maintains files on some of these waterbodies, and the information is available upon request.

Some circumstances under which a water may be assigned to Category 3 are identified below:

- The data and information were collected using unacceptable quality assurance/quality controls and could not be used to provide an accurate assessment.
- The quantity of the existing and readily available data and information is inadequate to provide an accurate assessment.
- The existing and readily available data and information are not representative of current conditions of the waterbody. Examples of conditions that might have altered current conditions are (1) significant land use changes occurred in the watershed affecting the hydrology and nonpoint loadings, (2) point source discharges were removed or new discharges are now operating, (3) Alaska made significant changes in applicable data collection methodologies, or (4) sampling station locations did not reflect the character of the waterbody segment.

The ACWA Process

Through the ACWA process, DEC, DNR, and ADF&G work together to focus state and federal resources on addressing issues of water quality, water quantity, and aquatic habitat for the waters with the greatest need. These cooperating agencies have developed a waterbody nomination and ranking process that relies on established criteria to identify priorities for assessment, stewardship, and corrective action needs. The process addresses waters affected by these and other problems: presence or risk of pollution, habitat degradation, and quantity problems. Several components of ACWA are interwoven and occur concurrently.

Determination About Future Actions

The entire ACWA process (consisting of the integrated components) is conducted in three phases: nomination, analysis, and action. During the nomination phase, each waterbody nominated by the public, agencies, or both is reviewed. Information identifying the waterbody is entered into the ACWA database. The nominator may be asked for additional information.

The ACWA database uses four tracks to identify the nominated waterbodies: Data Collection and Monitoring, Adequately Protected Waterbodies, Waterbody Recovery, and Protect and Maintain Waterbodies at Risk. Identification of the applicable track is an ongoing process and is affected by evaluations, analysis, and ranking, as well as receipt of additional data and information. Therefore, new knowledge or decisions may lead to placement of the waterbody in a different track. For example, during the analysis and action phases, the identification of additional data needs may result in the waterbody being reassigned to the Data Collection and Monitoring track.

Waterbodies for which data are not sufficient to suggest a current or anticipated problem are placed in the Data Collection and Monitoring track. The waterbodies for which sufficient and credible data are available and for which those data suggest existence of a current water quality, water quantity, or aquatic habitat problem or the likelihood of future problems are subject to additional evaluation. Those further evaluations assess the effectiveness of agency stewardship and determine the persistence of standard exceedances or of regulation violations. Many of these waterbodies are entered in the Protect and Maintain Waterbodies at Risk or Waterbody Recovery database tracks.

The determination about future actions primarily considers whether the water is at risk, in need of recovery, or adequately protected. The determination is used by the agencies to identify actions needed for a particular water.

Waterbodies that are at risk and waterbodies needing recovery are addressed as follows during the action phase:

- Priorities for action on individual waterbodies are established.
- Protection or recovery actions are identified and implemented.
- The success of protection/recovery actions and directing the waterbody for additional information, continued monitoring, or additional protection/recovery actions is evaluated.

Finally, waterbodies that are determined to be adequately protected are placed in the Adequately Protected waterbodies track.

Analysis of Data

During the analysis phase, a successfully nominated waterbody undergoes a series of determinations using established criteria to assess the adequacy and credibility of the associated data available for the waterbody. This step is called a "sufficient and credible data review." Tables used to assist in reviewing the rigor of the data and information associated with each water and to score each water are available at http://www.dec.state.ak.us/water/acwa/pdfs/su.pdf.

In scoring waters for sufficient and credible data, three topics are considered: Data Content, Data Coverage, and Data Quality. Parameters addressed under Data Content evaluate how sufficiently and completely the information contained in the nomination describes the nature and extent of the identified issue. Parameters addressed under Data Coverage and Data Quality evaluate the quality of the information provided and how rigorous it is.

Data Content scoring considers the basis for the assessment of use attainment, the land use information available for the water, information on the expected reference condition, information on the source or sources of pollution, and the availability of photographs showing the condition of the water. The objective is to identify whether the available data are sufficient to identify the existence or extent of a current or potential problem.

Data Coverage scoring considers the number of locations and seasonal information available. Data Quality scoring considers adequacy of the quality assurance and quality control for the information, whether sampling protocols were documented, and how relevant and current the information is.

Nearly all of the Category 3 waters identified in this Integrated Report have gone through the sufficient and credible data step in the ACWA process. A small number of waters at any given time are placed in a "pending" status until the water quality information and data associated with the water undergo a sufficient and credible data review step.

Creation of the ACWA Priority Ranking

In addition to the analysis of data and overall determination of future actions for the watershed, the waterbodies are ranked to establish priorities. The waterbody ranking enables agencies to focus resources on the most important priorities. Criteria were developed to assign a numeric value that identifies relative priority to each successfully nominated waterbody, resulting in the ACWA Priority Ranking.

Six factors are used to score each of three components: water quantity, water quality, and aquatic habitat. The six factors are as follows:

- Allocation, or the extent to which the water has been obligated for various uses
- Condition
- Protection
- Future use
- Present use
- Value

Evaluation for each of the six factors results in relevant scoring for each component. The possible scores are high (5), medium (3), or lower (1).

Staff from one of the three resource agencies reviews readily available information and data related to a given waterbody and use their best professional judgment to assign a factor rating. The agency with statutory or regulatory authority over the water resource component is responsible for assessing that

component. The following considerations guide the ranking decisions: (1) the statutory criteria, (2) severity of pollution, and (3) expected uses of the waters, according to CWA Section 303(d)(1)(A).

The DNR hydrologists provide factor ratings for water quantity; biologists in the ADF&G provide aquatic habitat factor ratings; and DEC provides water quality ratings. Appendix H provides ranking for each waterbody. More detailed information on the ranking process is available online at http://www.dec.state.ak.us/water/acwa/acwa_ranking.htm.

Distinctions for the ACWA Process and Listing of Waters by Category

For the ACWA process and the categorization or listing of waters in the Integrated Report, two important points should be noted:

- The process for the Integrated Report listing decisions is different from the process used for ACWA ranking and priorities. An impairment listing is considered in the ACWA process, and most waters that are listed as impaired under Categories 5 and 4 are ranked as high priority by the ACWA process. In other words, the Integrated Report plays a role in the ACWA prioritization process. ACWA does not drive the listing decision; it provides information management and helps with identifying and implementing actions that will remove impairments.
- One component of the ACWA process is an analysis of whether sufficient and credible information exists. This analysis is only used for ACWA prioritization for further action; it does not determine whether data are sufficient for a use in an attainment decision. The criteria used for attainment and listing decisions are discussed under the "Criteria Used to Classify a Waterbody as Category 5" section of this report.

Category 4 – Impaired Waterbody

Category 4 waters have been determined to be impaired but do not need a TMDL. The three subcategories of Category 4 waters are discussed below.

Category 4a – TMDL Has Been Completed

An impaired water that was previously listed in Category 5 but for which a TMDL has been completed and approved by EPA is assigned to this category.

For waterbodies that have been placed in this category, a TMDL addressing a specific impairment has been developed and approved by EPA. It is expected that implementation of that TMDL will result in full attainment of the WQS applicable for that specific impairment. If the waterbody has another impairment, the waterbody will also be assigned to Category 5 until a TMDL has been developed and approved for that impairment.

Monitoring is scheduled for Category 4a waters as dictated by the specific TMDL to verify that the WQS have been met after implementation of the water quality management actions needed to achieve one or more TMDLs.

Approved and final TMDLs can be found at http://dec.alaska.gov/water/tmdl/approvedtmdls.htm

There are 44 active impairments for which TMDLs have been developed on 37 waters are identified for placement in Category 4a and are described in Appendix A.

Criteria Used to Classify a Waterbody as Category 4a

The key criterion for Category 4a is a completed and approved TMDL.

Category 4b – Other Pollution Control Requirements Are Reasonably Expected to Result in Attainment of the Water Quality Standard in a Reasonable Period of Time

Waters are placed in this category when other pollution control requirements required by a local, state, or federal authority are stringent enough to achieve any WQS applicable to such waters within a reasonable time period. These pollution control requirements should specifically apply to the particular water quality problem.

Monitoring is scheduled for these waters as dictated by the specific Category 4b recovery plan to verify that the WQS criteria will be attained as expected.

There are a total of three Category 4b waterbodies.

Criteria Used to Classify a Waterbody as Category 4b

For waterbodies placed in Category 4b, controls and assurances are sufficiently stringent that the waterbody is expected to meet standards in a reasonable time period. The following are examples of pollution controls:

- An approved state or federal ROD associated with a state or federally approved cleanup action for a contaminated site
- An approved remediation plan for a permitted facility, such as a log transfer facility (LTF), reporting more than 1.5 acres of continuous residue coverage
- A National Pollutant Discharge Elimination System (NPDES) permit that incorporates TMDL-type controls for the permitted facility
- A water-quality based permit with controls or assurances that water quality goals will be met
- Restoration, remediation, or recovery measures or plans with controls and assurances that are sufficiently stringent to assure that water quality goals will be attained within a reasonable time period

Key factors that must be considered before placing a waterbody in Category 4b are as follows:

- The need for pollution controls or measures
- Whether requirements and controls are sufficiently stringent that standards can be expected to be met in a reasonable time period; incremental progress should be reported

- Assurances that the requirements and controls will be implemented in a reasonable time period

Placing a water in Category 4b requires EPA approval and the development of a Category 4b rationale that must address the following six elements:

1. Identification of impaired segment and statement of problem causing the impairment
2. Description of pollution controls and how they will achieve WQS
3. An estimate or projection of the time when WQS will be met
4. Schedule for implementing pollution controls
5. Monitoring plan to track effectiveness of pollution controls
6. Commitment to revise pollution controls as necessary

Determining whether to place a waterbody in Category 4b requires the application of best professional judgment and agency enforcement discretion. This approach includes discussion and analysis of a variety of factors such as pollutant characteristics (for instance, consideration of the magnitude, frequency, and duration of the pollution event or events), pollutant sources, size of the waterbody, the stringency of the requirements or assurances, and the degree of recovery response required.

Waterbodies associated with residue discharges also are placed in Category 4b if the following conditions are met: (1) two or more dive survey reports from LTFs document more than 1.5 acres of continuous residues coverage and (2) the waterbody is addressed in an approved remediation plan under the LTF General Permit (GP) or under an individual state wastewater discharge permit. (Information on remediation plans is provided in Appendix G.) Waterbodies that are under EPA compliance orders for seafood residue violations may also be considered for placement in Category 4b if the compliance order(s) ensures that the water will attain the water quality standard for the residues in a reasonable time period.

Category 4c – Impairment Is Not Caused By a Pollutant

Waterbodies are placed in this category if the impairment is not caused by a pollutant affecting water quality. An example of an impairment with a cause other than water quality is an area with hydromodification and low flow issues.

No Category 4c waterbodies are currently identified; however, Alaska's resource agencies may use this category to track waterbodies with non-pollutant impairments in the future.

Criteria Used to Classify a Waterbody as Category 4c

Alaska has not adopted specific criteria or standards to identify any impairments not related to water quality. ACWA priority rankings identify aquatic habitat or water quantity waters for action, but these waters are not referred to as "impaired" because they are not impaired in terms of water quality.

Category 5 – Impaired Waterbodies on the Section 303(d) List

Waterbodies are placed in Category 5 if one or more WQS criteria (in 18 AAC 70) are not attained. Waters are also placed in Category 5 if the waterbody is impaired for at least one criterion and a TMDL or waterbody recovery plan to attain applicable WQS criteria is required.

The 24 waterbodies identified for placement in Category 5 and on the Section 303(d) list are described in Appendix A.

Criteria Used to Classify a Waterbody as Category 5

The Alaska listing methodology for determining impairments from turbidity, pathogens, and residues is described in Appendix I.

Waterbodies in Category 5 constitute the CWA Section 303(d) list of waters impaired by one or more pollutants and for which applicable TMDLs are needed. A waterbody is listed in this category if application of Alaska's assessment and listing methodology finds that a pollutant has caused impairment. According to CWA Section 303(d) and EPA's implementing regulations, Section 303(d)-designated waters include impaired surface waters that do not or are not anticipated to meet applicable WQS solely through the implementation of existing technology-based or similar controls. In Alaska, these waterbodies are priority-ranked based on the severity of the pollution, the feasibility of implementing a waterbody recovery plan, and other factors. The development of a TMDL or equivalent waterbody recovery plan for these waterbodies is scheduled 8 to 13 years into the future from the time they are first placed on the Section 303(d) list (see Appendix C: TMDL Schedule and Factors).

Impaired waterbodies are surface waters with documentation of actual or imminent persistent exceedances of water quality criteria, adverse impacts to designated uses, or both, as defined in Alaska WQS. Designation of a waterbody as impaired does not necessarily indicate that the entire waterbody is affected. In most cases, only a segment of the waterbody is affected. When possible, the assessment process identifies the specific segment that is impaired and the corresponding pollutant parameters of concern.

The term "persistent" is key to determining whether a surface waterbody is impaired. Determining persistent exceedances of WQS is a waterbody-specific decision that requires the application of best professional judgment. This approach includes discussion and analysis of a variety of factors such as pollutant characteristics (for instance, consideration of the magnitude, frequency, and duration of the pollution event or events); pollutant sources; size of the waterbody; and the degree of remediation response required.

DEC makes impairment determinations based on credible data. The term "credible data" means scientifically valid chemical, physical, or biological monitoring data collected under a scientifically accepted sampling and analysis plan, including quality control and quality assurance procedures that are consistent with Alaska WQS (18 AAC 70). Water quality data supportive of an impairment determination must be specific to the waterbody. Water quality data and information that are less than 5 years old are preferred. In certain instances, data and information more than 5 years old may be

considered in an impairment determination. For those instances, the data and information are carefully scrutinized and reviewed before they are validated as credible.

Impairment determinations must be substantiated with empirical water quality chemistry unless the water quality criterion is a narrative qualitative standard such as the absence of a visible sheen or presence of sludge.

DEC uses the following guidelines to determine whether a waterbody is impaired:

- Water quality monitoring data that documents persistent exceedances of a criterion or criteria established in Alaska WQS (18 AAC 70).
- EPA guidelines and guidance.
- Photographs or videos with appropriate documentation definitively linked to persistent exceedances of WQS. Documented persistent presence of residues (floating solids, debris, sludge, deposits, foam, scum) on or in the water, on the bottom, or on adjoining shorelines.
- Documentation or water quality data, such as a report or study within the last five years, which demonstrates designated uses are adversely affected by pollutant condition data. Data or documentation older than five years old is only considered if it is determined to reflect the current condition of the waterbody.
- Developed listing methodology guidelines demonstrates impairment.
- Documentation from a resource agency or other credible source that applies the use of best professional judgment to provide credible data. Best professional judgment is used to determine whether a waterbody persistently exceeds WQS or has designated uses that are adversely affected by pollutant sources.

Best professional judgment determinations should be made by more than one professional and at the agency level; must be made by a professional knowledgeable in the relevant field of expertise and generally be based on that person's experience and all the information reasonably available at the time; should be based on the best available scientific data and information; and must be subject to management level review.

Best professional judgment recommendations from outside DEC must be affirmed by DEC, and available data and basis for the decision should be documented.

Alaska's process for listing an individual waterbody under Section 303(d) begins with an internal review of existing and new information for ACWA-nominated waters or former open files. Waters may be brought to the attention of DEC by its staff, other state and federal agencies, municipalities, Native organizations and tribes, industry, and the concerned public. In the development of the Integrated Report, DEC solicits public participation in providing existing and readily available water quality data and information.

DEC staff initially evaluate available information about a waterbody to determine the presence of pollutants and/or persistent exceedances of WQS or impacts to the designated uses and the degree to which WQS are attained. This process constitutes a DEC desk audit and may involve a preliminary field

review and the collection of water quality monitoring data. The possible findings and the subsequent actions are described below:

- Credible data and information indicates that the waterbody may be impaired and that existing controls may be inadequate to attain or maintain standards in a reasonable time period. The waterbody is placed on the Category 5 list. As needed, these Section 303(d) listed waterbodies are scheduled for comprehensive water quality assessments.
- Credible data and information indicates that the waterbody may be impaired and that existing controls are adequate to attain or maintain standards in a reasonable time period. If a water undergoes the process associated with a Category 4b assignment and meets those requirements, the waterbody may be placed in Category 4b. Category 4b waters are tracked and monitored until standards are achieved.
- Credible data and information on a waterbody indicates the waterbody is not impaired. The waterbody is placed in Category 1 or 2. Category 1 and 2 waters typically require no further action but may be reconsidered at any time if new water quality data or information becomes available.

Not all Section 303(d)-designated waters have undergone comprehensive water quality assessments to determine either the extent of water quality impairment or whether existing controls are adequate to achieve the standards. DEC closely scrutinizes waterbodies to determine whether suspected water quality violations were thoroughly investigated and documented. This approach is designed to prevent the listing of waterbodies with inconclusive or circumstantial data or solely on observations.

A completed water quality assessment of a Category 5 waterbody confirms the extent of impairment to water quality, designated uses, or both. A comprehensive assessment requires the identification of the pollution source and pollutant causing the impairment. The subsequent actions that follow specific findings of the assessment are described below:

- The assessment indicates the waterbody is impaired and that existing controls are inadequate to achieve WQS in a reasonable time period. Category 5 waterbodies require a TMDL or equivalent waterbody recovery plan.
- The assessment indicates the waterbody is impaired but confirms existing controls are adequate to achieve standards in a reasonable time period. The waterbody is placed on the Category 4b list.
- The assessment indicates that the waterbody is not impaired. The waterbody is placed in Category 1 or 2.

Section 303(d) listed waterbodies are scheduled for TMDL development or waterbody recovery plan, now and out to year 2017. The TMDL schedule and the criteria for developing the schedule are provided in Appendix C.

DEC has developed specific listing criteria guidelines for the most common pollutants for impairments from turbidity, pathogens, and residues in Appendix I. Addition listing criteria guidelines for residues is contained in Appendix G. Site specific information including biological assessment information (such as sediment profiling imaging) can be used to help determine whether an impairment exists and may be

used to justify variance from listing methodologies as long as the information provides a clear demonstration as to whether the waterbody is meeting the applicable water quality standard.

Removal of Waterbodies from the Category 5 List

After a waterbody has been placed on the Category 5 list, several conditions can lead to removal of the waterbody from the list. All determinations to remove waterbodies from the Category 5 list are subject to approval by EPA. One or more of the following conditions can support delisting of a waterbody:

- More recent and accurate data show that one or more of the applicable WQS criteria are met.
- More sophisticated water quality modeling demonstrates that one or more of the applicable WQS criteria are met.
- Flaws in the original analysis of data and information led to the water being incorrectly listed.
- Revised listing methodology criteria negate the original rationale for listing.
- The water quality criteria for which the waterbody was listed has been revised and the water meets the new water quality standard.
- Sufficiently stringent requirements have been applied. Examples are incorporation of TMDL-type controls into the NPDES permit or controls such as those applied by a cleanup or remediation plan with assurance that one or more of the WQS criteria will be met within a reasonable time period.
- A TMDL or equivalent waterbody plan has been developed. If a TMDL is developed, the water is placed in Category 4a; if an equivalent waterbody recovery plan is developed, the water is placed in Category 4b.
- Other pollution controls that ensure WQS criteria are attained in a reasonable time period (as described for Category 4b waterbodies).
- Other relevant information supports the decision that the water should not be included on the Category 5 list.

The following protocols are applied to all waterbodies associated with a permitted facility and Category 5/Section 303(d) listed for residues, regardless of an active discharge on site:

- For waterbodies Section 303(d) listed after 1998 and determined to be impaired for residues based on <u>two</u> or more dive surveys:
    - DEC requires two consecutive dive surveys documenting that continuous residues coverage is no more than 1.5 acres before the waterbody is eligible for removal from the Category 5/Section 303(d) list and for placement in either Category 1 or 2.
- For waterbodies Section 303(d) listed in 1998 or earlier (based on 1.0 acre) and determined to be impaired for residues based on <u>one</u> dive survey or best professional judgment:

- DEC requires one dive survey documenting that continuous residues coverage is no more than 1.0 acre before the waterbody is eligible for removal from the Category 5/Section 303(d) list and placement in Category 1 or 2.

In addition to consideration of the continuous residues coverage standard of 1.5 acres, DEC may consider biological assessment information, such as sediment profile imaging, in a determination to remove a water on the Section 303(d) list for residues.

In addition, all of the following conditions are required to support a determination to remove a water from the Category 5 list:

- "Good cause"—an explanation of why or on what basis the water was originally listed and why it is now appropriate to remove the listed water or redefine the listed area—has been demonstrated.
- An administrative record and documentation supporting the recommended determination is needed.
- A public notice of the proposed delisting is published and public comment is sought. Typically the Integrated Report acts as the vehicle for providing public notice and soliciting comments. In special instances, a public meeting could be held in the community closest to the waterbody in question.
- When considering a determination to remove a waterbody from the Category 5 list, in most instances the level of data to support a determination and burden of proof are not required to be greater than were used in the initial listing determination. In certain instances, determined on a case by case basis, additional data or monitoring techniques may be needed to have confidence that water quality standards are attained.

APPENDIX A Waterbody Categories 2 through 5

The tables in this appendix describe the waterbodies that have been placed in Categories 2 through 5. No waterbodies in Alaska have been identified as Category 1 because the state does not possess that level of information for any one waterbody.

To more easily sort and find waterbodies within the tables of this appendix, each waterbody is associated with one of three general regions in Alaska. Within each category, waterbodies are organized by region in the following order: Interior, Southcentral, and Southeast.

Unless otherwise stated in the narrative associated with a waterbody, no determination has been made about the effects to any designated use(s) for that waterbody.

The following abbreviations or notations are used consistently in Appendix A tables:

- The "Region" column indicates the general region of Alaska in which the waterbody is located. The abbreviations are defined as follows: IN for Interior, SC for Southcentral, and SE for Southeast.
- The "AK ID Number" column identifies the Alaska waterbody-specific identification number, such as "20402-409." The first five digits of the number represent the USGS hydrologic (catalog) unit in which the waterbody is located. The last three digits identify the type of waterbody, as follows: 001 for rivers, creeks, or streams; 400 for lakes; 500 for bays (i.e., marine waters); 600 for estuaries; 700 for wetlands; and 800 for coastal waters (i.e., coastline).
- The "Waterbody" column provides the name of the waterbody.
- The "Location" column describes the area or provides location information to clarify the location of the waterbody.
- The "Area of Concern" column describes the specific area of the waterbody that is considered. The abbreviation "N/A" means either "not applicable" or "not available."
- The "Water Quality Standard" column identifies the 18 AAC 70 standard that is being measured. This column also identifies one or more WQS that are not attained in the waterbody if the water is a CWA Section 303(d) listed (Category 5) waterbody.
- The "Pollutant Parameters" column identifies the specific pollutant or pollutants for which the waterbody is impaired or, for non-impaired waterbodies, the specific pollutant or pollutants of concern. For instance, a waterbody could be Section 303(d) listed as impaired for the "Residues" standard from the specific pollutant parameter of bark and woody debris.
- The "Pollutant Sources" column identifies the source or sources of the pollutant or pollutants.

Category 2 Waterbodies

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
IN	**Category 2**	**40510-005**	**Caribou Creek**	**Denali National Park**	**16.1 miles**	**Turbidity**	**Turbidity**	**Mining**
Caribou Creek was placed on the 1994 Section 303(d) list for turbidity from past mining activity within Denali National Park and Preserve. The waterbody lost its sinuosity along segments of the watershed. Currently there is no active mining on Caribou Creek and current National Park Service (NPS) policy will not permit future placer mining. NPS, EPA, and DEC conducted a site visit in 2009 to review the progress of previous reclamation efforts and to assess any areas requiring additional reclamation activities. NPS established seven cross sections for floodplain design purposes conducting topographic monitoring before and after the establishment of the cross sections. Channel locations and sinuosity were surveyed with a global positioning system (GPS), and water discharge was measured. Analysis and evaluation of site and data resulted in a conclusion that Caribou Creek is meeting the turbidity standard, although further work would be beneficial. Therefore, a draft recovery plan was prepared to reconstruct the floodplain, rebuild the channel(s), and provide for more natural overbank flooding and deposition. The reconstruction work, including revegetation, stream channel modification and floodplain work was completed in 2010. Caribou Creek was moved to Category 2 in 2010 .								
IN	**Category 2**	**40506-007**	**Chena River**	**Fairbanks**	**15 miles**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
Chena River was Section 303(d) listed in 1990 for turbidity, petroleum hydrocarbons, oils and grease, and sediment. The identified pollutant source is urban runoff. DEC conducted sampling in 2005, 2007, and 2009 for hydrocarbons and sediment. Data have shown that the Chena River met WQS for the petroleum hydrocarbon standard but remains impaired from sediment. Data are currently being collected and reviewed for the sediment standard. The petroleum hydrocarbon impairment for Chena River was removed in the 2010 Integrated Report.								
IN	**Category 2**	**40506-002**	**Chena Slough**	**Fairbanks**	**13 miles**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
Chena Slough was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons, oils and grease and sediment standard. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum problem existed and was affecting water quality. File assessment information indicates nonpoint source problems resulting from surface water runoff, road construction, site clearing, and dewatering activities from gravel operations. Based on best professional judgment of DEC staff this water was listed for petroleum products. DEC conducted water quality testing in 2005, 2007, and 2009. Data have shown that the Chena Slough met WQS for the petroleum hydrocarbon standard. Data are currently being collected and reviewed for the sediment standard. The petroleum hydrocarbon impairment for Chena Slough was removed in 2010.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
IN	**Category 2**	**40505-401**	**Harding Lake**	**Fairbanks**	**N/A**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Harding Lake first appeared on the Alaska Section 303(d) list in 1994 for fecal coliform bacteria. In compiling the 1994 list, data were reviewed from studies conducted in 1974, 1986, 1987, 1988, and 1994. Virtually all data showed Harding Lake was consistently meeting the FC bacteria WQS during each sampling effort. However, one sample collected in 1986 showed a high level of FC bacteria (more than 60 colonies/100 milliliters [ml]). Although the geometric mean of 29 samples taken during the 1986 study was meeting WQS (15.7 colonies/100 ml), a graduate student study of Harding Lake suggested the lake may not be meeting the standard because of extensive recreational use. Because of this concern, DEC decided that "based on the limited sample results and high population density using onsite wastewater disposal systems, it is likely that additional monitoring will show the waterbody to be water quality limited for fecal coliform bacteria." Data collected in fiscal years 1999, 2000, and 2001 through an approved QAPP showed 83% non-detects and no exceedances of Alaska WQS (18 AAC 70) for FC bacteria of less than 20 FC/100 ml. These results were consistent with samples collected in 1987, 1988, and 1994 that also showed Harding Lake attaining WQS. A sampling report prepared by the DNR Division of Land, Mining and Water (DOLMW) and DEC and previous studies by DEC documents this information. In summary, the initial listing relied on one sample event and a concern that increased recreational use of the lake was causing suspected additional FC bacteria inputs to the lake. In reviewing the initial listing, it is clear that the one high sample result was an inconsistent outlier and should not have led to listing Harding Lake as impaired. Later sampling showed WQS are being achieved and the recreational use of the lake is not causing violations as initially suspected. The new level of information showing Harding Lake should be delisted is a much stronger body of evidence than that used for the original listing determination. Based on the findings, Harding Lake was removed from Alaska's Section 303(d) list of impaired waters in the 2002/2003.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
IN	**Category 2**	**60402-601**	**Nearshore Beaufort Lagoons**	**Sag River to Simpson Lagoon**	**N/A**	**Temperature, Dissolved Inorganic Substances**	**Temperature, Salinity**	**Causeway**
Nearshore Beaufort Lagoons were placed on the 1996 Section 303(d) list for temperature and salinity. In 1998 the waterbody was delisted and moved to Category 4b for tracking and monitoring. Various study reports and information from the EPA Alaska Operations Office indicated that the hydrology and water quality (temperature and salinity) of the Nearshore Beaufort Sea was affected by the causeways and was suspected to have adverse effects to anadromous fish in 1996. Mitigation to correct problems with water quality and fish passage agreed upon in the Negotiated Settlement Agreement for Endicott and West Dock Causeways between the U.S. Army Corps of Engineers (USACE) and the permit holders (Public Notice 91-1). This mitigation, described more specifically in permit modification FF 820562, consisted of additional breaching at both West Dock and Endicott causeways. Breaching construction was finished in fall 1995. The North Slope Borough requires water quality monitoring of the waterbody as a condition to conduct oil and gas operations adjacent and within the waterbody. Monitoring for temperature and salinity of Nearshore Beaufort Lagoons is performed on an annual basis during the ice-free periods, as required by the North Slope Borough. Data and information developed by BP Exploration were transmitted to DEC and EPA in 2002 support that this waterbody is attaining the WQS for temperature and dissolved inorganic substances. Post-causeway monitoring studies have demonstrated that there is no biological impact and that water quality is within state standards. Based on this information, the waterbody was placed in Category 2 in 2002/2003.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
IN	**Category 2**	**40510-003**	**Slate Creek**	**Denali National Park**	**2.5 miles**	**Turbidity**	**Turbidity**	**Mining**
Slate Creek was placed on the Section 303(d) list as impaired from turbidity in 1994**.** The impairment was caused by historic mining activity that occurred from the early 1900s and continued sporadically until 1983. Stream restoration activities were implemented by the NPS and include re-vegetation of disturbed soils and reconfiguration of the stream channel. Water quality monitoring by USGS from 2008-2011 indicate that the creek is meeting the turbidity standard, however there are exceedances of antimony and arsenic standards. The turbidity impairment for Slate Creek is proposed to be removed in the 2012 Report.								
SC	**Category 2**	**30102-604**	**Akutan Harbor**	**Akutan Island**	**17 acres (0.0266 sq. mi.)**	**Dissolved Gas**	**Dissolved Oxygen**	**Seafood Processing/ Waste**
Akutan Harbor was placed on the 1994 Section 303(d) list for residues and dissolved gas. EPA issued a TMDL for Akutan Harbor on February 12, 1995. EPA finalized the associated NPDES permit for this area in spring 1996. The waterbody was removed from the Section 303(d) list in 1998 and placed on Category 4a. Water quality sampling during the summer of 2008, 2009, and 2010 as well as a 2011 benthic survey indicate that the water quality standard for dissolved gas in the water column is being met. The harbor remains listed for residual solids that exist in quantities larger than the permitted zone of deposit. The residual solids or residue TMDL remains in effect and will address and impacts in the immediate area from this impairment. Those solids are being actively degraded anaerobicly inside the residual pile and that reduces its size. The current APDES Permit continues to require dissolved oxygen monitoring to ensure that the residual pile does negatively impact or cause an impairment of the dissolved oxygen water quality criteria. The dissolved oxygen impairment for Akutan Harbor is proposed to be removed in the 2012 Report. A TMDL remains in effect for residue on Akutan Harbor.								
SC	**Category 2**	**30102-605**	**Captain's Bay**	**Unalaska Island**	**N/A**	**Residues**	**Settleable Solids**	**Seafood Processing**
Captain's Bay was placed on the 1994 Section 303(d) list for settleable solids. Data used for the 1994 list indicated that the established zone of deposit (ZOD) for the seafood processing discharger was being exceeded. Monitoring data evaluated by the DEC has resulted in the conclusion that the discharger is meeting ZOD requirements. This waterbody was removed from the Section 303(d) list in 1998. APDES permits continue to be issued and enforced.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**20401-403**	**Cheney Lake**	**Anchorage**	**N/A**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Storm Drainage**
Cheney Lake was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. Water quality data collected by the Municipality of Anchorage from 1991 to 1994 indicated that the FC bacteria criterion was exceeded in almost every month of monitoring. However, in 2006 DEC conducted extensive water quality monitoring in Cheney Lake. The 2006 data shows FC bacteria levels met state WQS the vast majority of the time. DEC believes the higher levels, when state WQS were exceeded, are from natural conditions. Cheney Lake is currently meeting WQS for two reasons: (1) the Municipality of Anchorage (and USF&WS) campaign to reduce the goose populations in Anchorage (because of increased number of geese/aircraft incidences, including a crash of a military plane with numerous fatalities blamed on waterfowl), and (2) a successful public awareness campaign educating pet owners on the benefits and owner responsibility of picking up after pets, i.e., "Scoop the Poop" campaign. As a result of this monitoring, Cheney Lake was removed from the Section 303(d) list in the 2008 Report.								
SC	**Category 2**	**20505-001**	**Cottonwood Creek**	**Wasilla**	**Entire 13 miles**	**Residues**	**Foam & Debris**	**Urban Runoff, Urban Development**
Cottonwood Creek (13 miles) was placed on the Section 303(d) listed in 2002/2003 for non-attainment of the residues standard for foam and debris. DEC had received numerous complaints about foam in Cottonwood Creek and foam was observed in the creek in 1998, 2000, 2001, and 2002. An intensive water quality evaluation was conducted, commencing in September 2004. Water quality sampling conducted in 2004, 2005 and 2006 indicated that the foam present in Cottonwood Creek is naturally occurring and to be meeting WQS. Continued water quality sampling (2006) focused on determining the extent of FC bacteria and temperature exceedances. The additional sampling identified FC bacteria as a concern. Temperature was determined to be naturally occurring hence meeting WQS. FC bacteria exceeded WQS, and the source(s) is unknown. DEC conducted a study in 2010 using Microbial Source Tracking to determine if detected bacteria were from humans, *Fecal Coliform Bacteria Source Assessment in the waters of Cottonwood Creek, Wasilla, and Little Campbell Creek, Anchorage* (November 2010). Results indicate that humans are a source to the increase FC bacteria in Cottonwood Creek. The residue impairment (foam) was removed in the 2010 Report. Cottonwood Creek remains impaired for FC bacteria.								

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**30102-606**	**Dutch Harbor**	**Unalaska Island**	**0.5 acre**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Industrial, Urban Runoff**
Dutch Harbor was placed on the Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study in August 1994, *Water Quality Assessment for Greater Unalaska Bay*, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for benzene, toluene, ethylbenzene, and xylenes (BTEX); polycyclic aromatic hydrocarbon (PAH); and total organic carbon (TOC). Results indicated the water column meets WQS but several sediment results had surface sheening in exceedance of the standard. The original area of impairment was reduced in the 2010 Report. The TMDL for the remaining impaired areas was completed in July 2010 and approved by EPA in September 2010. Implementation focuses on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.								
SC	**Category 2**	**20302-601**	**Eagle River Flats (60 acres)**	**Fort Richardson**	**N/A**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**White Phosphorus, Munitions Residues**	**Military Base Operations**
Eagle River Flats was placed on the 1996 Section 303(d) list for white phosphorus. EPA prepared a report, *Eagle River Flats - Comprehensive Evaluation Report*, in July 1994. This report is a detailed environmental assessment that qualifies as a waterbody assessment. The report presents water quality data and other information on the relationship between white phosphorous (from artillery shell residue) and its lethal effect on waterfowl in the Eagle River Flats (ERF) area. A ROD was signed on September 30, 1998, placing the water in Category 4b. Approximately 60 acres were identified as contaminated and requiring treatment. Remediation activities occurred in 1998–2001. During each field season, six pumping systems were placed into the contaminated ponds and operated to drain the water from the ponds. Draining the ponds allowed the sediments to dry out and caused the white phosphorus to oxidize and no longer be a threat to the waterfowl. Field activities resulted in a dramatic decrease in white phosphorus concentrations in more than half the total acreage identified as contaminated. By 2004, more than 75 percent of the contaminated areas were addressed. The remaining area was treated in 2005, the last year for active treatment. The Army is now in the long-term monitoring phase to ensure that the remedial action will meet the long-term goal of reducing duck mortality to levels identified in the ROD. Additional pumping of water from the ponds and drying of white phosphorus contaminated sediments occurred in 2007. In 2010, the Army met with the remedial project managers and discussed their plans to pursue an EIS (completion date anticipated January 2012) in an effort to open the ERF to year-round firing. This may require a change to the ROD. DEC's Contaminated Sites section summary on Eagle River Flats can be viewed at http://146.63.9.103/Applications/SPAR/CCReports/Site_Report.aspx?Hazard_ID=431. DEC considers the Army to have met the milestones in the ROD, and mortality is considered to be at levels typical for the species in this area. This water was removed from Category 4b in 2008.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**30204-023**	**Eskimo Creek**	**King Salmon**	**N/A**	**Petroleum Hydrocarbons, Oils & Grease; Toxic & Other Deleterious Organic and Inorganic Substances**	**Petroleum Products, Diesel Range Organics, Trichloroethylene**	**Landfill, Fuel Storage, Former Underground Storage Tanks, Former Dry Wells (Injection Wells), Military**
Eskimo Creek was initially placed on the 1996 Section 303(d) list based on information provided by the EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or "Superfund" group. Seeps from a fuel storage area, former dry wells, and a dump adjacent to Eskimo Creek led to potential stream water contamination by metals, pesticides, and petroleum hydrocarbons. The waterbody was listed for these parameters in 1996. Later information suggested removing metals and pesticides as a pollutant parameter because no analytical tests support these constituents as contaminants of concern and placement of this segment of Eskimo Creek in Category 2. The primary sources of petroleum hydrocarbons and trichloroethylene (TCE) from aboveground storage tanks and dry wells have been removed. A final ROD for Groundwater Zone 1 was signed by DEC and the Air Force in November/December 2000. A final ROD for Groundwater Zone 2 and a Zone 2 Addendum were signed by DEC in December 2002 and 2003 and by the Air Force in December 2003. Future activities based on the RODs include removal of extruding surface drums and debris and the recontouring and revegetation of the landfill cover; continued operation, maintenance, and monitoring of the biovent systems; monitored natural attenuation of the groundwater; groundwater modeling; continued operation of the water treatment system; annual monitoring of groundwater (A-Aquifer and B-Aquifer) and surface water; implementation and maintenance of institutional controls; and 5-year reviews. The last five year review in 2006 showed remediation was progressing, and the 2011 review is not yet complete. The waterbody was placed in Category 2 because WQS are attained for petroleum hydrocarbons, TCE, and diesel-range organics (DRO) in 2002/2003.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**20201-401**	**Eyak Lake**	**Cordova**	**50 feet of shore-line**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products, Petroleum Contamination, Sheen**	**Above Ground Storage Tanks, Spills**
Eyak Lake was placed on the 2002/2003 Section 303(d) list for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. Remedial actions at the Cordova Electric Power Plant on Eyak Lake, including a groundwater pump-and-treat system and passive product collection, have been effective at eliminating sheen on the surface of the lake, which was last observed in 2005. Groundwater treatment and monitoring is anticipated to continue at this site in the future. In 2005 and 2006, two water quality studies were completed on the lake. Although these studies showed the lake meeting standards, local residents expressed other petroleum-related concerns. Additional evaluation was warranted, and a study, started in 2009 verified if sheens were present and whether they were natural or anthropogenic. The report was completed in 2010. The report concluded that the sheens are the product of soil bacteria and not from anthropogenic sources. DEC is proposing to remove Eyak Lake from the Category 5/Section 303(d) list and place the water in Category 2 in the 2012 Report.								
SC	**Category 2**	**20401-412**	**Hood /Spenard Lake**	**Anchorage**	**N/A**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Industrial**
Hood/Spenard Lake was placed on the Section 303(d) list in 1996 for FC bacteria; Hood/Spenard Lake was later placed in Category 4a because a TMDL for FC bacteria was developed and finalized on September 30, 1997. Review of water quality data from 2000 to 2009 shows that the waters are meeting the FC bacteria standard. The waterbody was moved to Category 2 in 2010. This waterbody remains on the Category 5 Section 303(d) list for low DO.								
SC	**Category 2**	**30102-502**	**Iliuliuk Bay**	**Unalaska Island**	**N/A**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
Iliuliuk Bay was placed on the Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study, *Water Quality Assessment for Greater Unalaska Bay (August 1994)*, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006 with completing an existing data compilation and identifying and prioritizing potential risk sources. Rigorous field sampling events were conducted in April 2007 and September 2007 and included water column and sediment samples for BTEX, PAH, and TOC. All sample results for Iliuliuk Bay indicate the water and sediments are meeting standards for petroleum hydrocarbons. DEC removed Iliuliuk Bay from the Category 5/Section 303(d) list in the 2010 report.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**20402-409**	**Jewel Lake**	**Anchorage**	**N/A**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Land Development**
Jewel Lake was placed on the Section 303(d) list in 1994 for FC bacteria. A TMDL was developed and finalized on September 30, 1997. Jewel Lake was removed from the Section 303(d) list to Category 4a in the 1998 Report. Monitoring results from July through October 2008 and May and June 2009 indicate the water is meeting state WQS for FC bacteria. The waterbody was moved to Category 2 in the 2010 Report.								
SC	**Category 2**	**20701-502**	**Kazakof Bay**	**Afognak Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Kazakof Bay was placed on the 1998 Section 303(d) list for non-attainment of the residues standard for bark and woody debris. Dive survey information for this LTF (known as Kazakof Bay 1) document exceedances of the bark accumulation level for the interim intertidal threshold (according to the ATTF *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.2 acres of bottom coverage in February 2000 and at 3.0 acres in February 2001. A March 2004 dive survey report documented 0.20 acre of continuous residue coverage. Therefore, the water was removed from Category 5/ Section 303(d) list and placed in Category 2 in the 2004 Report.								
SC	**Category 2**	**20302-005**	**Kenai River (lower)**	**Kenai**	**Slikok Creek (river mile 19.0) to the mouth (river mile 0.0)**	**Petroleum Hydrocarbons, Oils & Grease**	**Total Aromatic Hydrocarbons**	**Motorized Watercraft**
Kenai River was placed on the Section 303(d) listed in 2006 for petroleum hydrocarbons (total aromatic hydrocarbon [TAH]). Between 2000 and through 2007, data that showed exceedances of the petroleum hydrocarbon water quality standard for TAH during the month of July. A water quality study conducted by DEC in 2003 confirmed the source of the petroleum hydrocarbon pollution was from motorboats. Sampling also indicated detections in the river of no petroleum in May, low levels in June, exceedances in July, low levels in August, and no contamination in September. In 2008, regulatory actions taken by ADF&G and DNR, requiring all outboard engines operating on the Kenai River during the month of July to be either four-stroke or direct fuel injection two-stroke motors, allowed the Kenai River to be moved to Category 4b. Intensive water quality monitoring conducted in July 2008 and 2009 confirmed the actions taken resulted in the Kenai River attaining waterbody standards. The Kenai River was moved to Category 2 in the 2010 Report. Petroleum hydrocarbon (TAH) samples were collected in July 2010 and 2011. Analytical results for both years demonstrated petroleum hydrocarbon concentrations were well below the WQS of 10 parts per billion TAH. DEC will continue periodic monitoring as motorboat use changes to ensure WQS are being met.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**30203-001**	**King Salmon Creek**	**King Salmon**	**N/A**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Landfill, Military, Unknown Drum Contents**
King Salmon Creek was placed on the 1996 Section 303(d) list for petroleum hydrocarbons, oils and grease and for metals and pesticides. Monthly influent and effluent samples are analyzed for all potential contaminants of concern. A final ROD for Groundwater Zone 3 was signed by DEC and the Air Force in April 2000. Activities required by the ROD include landfill cover inspection and maintenance; continued operation of the water treatment system; annual monitoring of groundwater (A-Aquifer and B-Aquifer) and surface water; maintenance of institutional controls; and a 5-year review. The extensive sampling program has not identified any exceedances of surface WQS at this site; therefore, the waterbody was placed in Category 2 in the 2002/2003 Report.								
SC	**Category 2**	**20701-501**	**Lookout Cove**	**Afognak Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Lookout Cove was placed on the Section 303(d) in 2002/2003 list for non-attainment of the residues standard for bark and woody debris. Dive survey information for this LTF from 2002 reported 1.2 acres of continuous residues coverage, and 2003 dive survey information reported 0.7 acre of continuous bottom coverage. These dive surveys document that the residues coverage is less than the 1.5 acres impairment standard for residues; therefore, the waterbody was removed from the Category5/Section 303(d) list and placed in Category 2 in 2004.								
SC	**Category 2**	**30204-001**	**Naknek River**	**King Salmon**	**N/A**	**Petroleum Hydrocarbons, Oil & Grease; Toxic & Other Deleterious Organic and Inorganic Substances**	**Petroleum Products, TCE**	**Landfill, Fuel Storage, Former Marina, Military**
Naknek River was placed on the Section 303(d) listed in 1996 due to pollutants from tributary waterbodies (Eskimo Creek, King Salmon Creek, and Red Fox Creek). In 1998 Naknek River was removed from the Section 303(d) list because other pollution controls were in place. The primary contaminant sources (a drum storage area and underground storage tanks) were removed prior to 1988. In 1998, and later in 2000, it was determined that this waterbody needed additional monitoring and tracking. Samples were collected from the Naknek River at various locations over the years for laboratory analysis. No results were detected above state and federal regulatory levels. In December 1998, oil sheen was observed on the Naknek River bank adjacent to the King Salmon Morale, Welfare, and Recreation Marina. In 1999 a final ROD was signed by DEC and the Air Force for a groundwater area located approximately 1/2-mile downstream from the main runway at the King Salmon Airport that includes approximately 3,000 feet of the Naknek River's north shore. Future activities identified in the ROD include passive product recovery system operation and maintenance; annual monitoring of groundwater and surface water; landfill cover inspection and maintenance; implementation and maintenance of institutional controls; and a 5-year review. Between September 2002 and January 2003, approximately 1,100 cubic yards of petroleum-contaminated soil was removed. Groundwater, surface water, and sediment monitoring will continue at the marina to evaluate remedial efforts and attenuation processes. No seep or sheen has been observed following the source removal action. Naknek River was placed in Category 2 in 2004.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
IN	**Category 2**	**50404-001**	**Red Dog Creek, Ikalukrok Creek**	**Near Red Dog Operation**	**N/A**	**Dissolved Inorganic Substances**	**Total Dissolved Solids**	**Mining**
Red Dog and Ikalukrok Creeks were placed on the Section 303(d) list in 1994 for total dissolved solids. EPA approved a site-specific criterion for zinc in July 1998. EPA approved DEC's reclassification of the uses of Red Dog and Ikalukrok Creeks for industrial water supply in February 2002. The facility was issued a water quality-based permit and the revised permit is an existing control that will bring the waterbody into compliance with applicable WQS (fresh water industrial water supply) for total dissolved solids (TDS), cadmium, lead, selenium, and the site-specific standard for zinc. A site-specific criterion for TDS was developed and approved by EPA on April 21, 2006. In the 1998 Integrated Report, Red Dog and Ikalukrok Creeks were removed from the Section 303(d) list and placed in Category 4b; however, because of the development of the reclassification, the water-quality based permit, the site specific criteria for zinc and TDS, and both Red Dog Creek and Ikalukrok Creek meeting the 1,500-milligram-per-liter site specific criteria for TDS, these creeks are in attainment of WQS. Therefore, the waterbody was placed in Category 2 in 2006.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**30204-002**	**Red Fox Creek**	**King Salmon**	**N/A**	**Petroleum Hydrocarbons, Oils & Grease; Toxic & Other Deleterious Organic and Inorganic Substances**	**Petroleum Products, Diesel Range Organics, Benzene, and Trichloroethylene**	**Landfill, Fire Training Areas, Military**
Red Fox Creek was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons and oils and grease standard for petroleum hydrocarbons and the toxic and other deleterious organic and inorganic substances standard for metals. Information provided by EPA's CERCLA (or Superfund) group showed that the waterbody was water quality impaired from petroleum hydrocarbons and TCE. Consequently, the metals parameter was dropped from this listing. Water quality assessment studies were completed for the waterbody, and a remediation plan implemented. Red Fox Creek formerly consisted of a small stream before construction of the airport runway in the 1940s. It is currently a losing stream with minimal flow that enters the groundwater system as it intersects the runway. Red Fox Creek does not directly affect the Naknek River. Contaminants of concern included DRO, gasoline-range organics (GRO), and benzene in surface water, and DRO, GRO, benzene, toluene, tetrachloroethene, and PAH in sediment. The 1997 remedial actions included the secondary source removal and treatment of the contaminated soil in on-facility biocells. The 1998 remedial actions included the installation of an air sparging and soil vapor extraction system. The treatment system had been intermittently and seasonally operated from 1999. The 2001 groundwater samples reveal DRO, GRO, TCE, and benzene above groundwater cleanup levels. During the Remedial Process Optimization Phase II meetings in 2002, which included participants from EPA, DEC, Air Force, Pacific Air Forces, Air Force Center for Environmental Excellence, and consultants, it was agreed that, based on operational data, the system should be converted into a biovent system to more adequately treat the contamination. The conversion occurred in late 2002. No surface water quality criteria were exceeded in 2002 and 2003. Future activities required by the ROD for this site include continued operation and maintenance of the biovent system; monitored natural attenuation of the groundwater; annual groundwater, surface water, and sediment sampling; implementation and maintenance of institutional controls; and 5-year review. The last five year review in 2006 showed remediation was progressing, and the 2011 review is not yet complete. This water was removed from Category 5/Section 303(d) list and placed in Category 2 in 2004.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SC	**Category 2**	**20401-020**	**Ship Creek**	**Anchorage**	**11 miles**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
Ship Creek was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons and oils and grease standard. Petroleum products floating on groundwater were believed to be moving toward Ship Creek and threatening the waterbody. In addition, fecal coliform (FC) bacteria monitoring data from 1989 to 1994, provided by the Municipality of Anchorage, exceeded WQS. In 1992 FC bacteria was added to the Section 303(d) listing as an impairing pollutant. The final FC bacteria TMDL was approved by EPA in May 2004. An EPA consent decree with the Alaska Railroad Corporation (ARRC) required groundwater monitoring. The monitoring has shown that petroleum product constituents do not pose a threat to the creek. In addition, DEC conducted monitoring to determine if a persistent sheen existed. This monitoring demonstrated that there was not a persistent sheen, nor were the analytical indicators for petroleum hydrocarbons present in sufficient concentration to exceed the water quality standard. Therefore, the petroleum hydrocarbons impairment is proposed to be removed in the 2012 Report.								
SC	**Category 2**	**30104-601**	**Saint Paul Island Lagoon**	**St. Paul Harbor, St. Paul Island**	**N/A**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Leaking Aboveground Storage Tanks**
Saint Paul Island Lagoon was placed on the 2002/2003 Section 303(d) list for the petroleum hydrocarbons and oils and grease standard for petroleum products. An oil sheen was observed on the water on a daily basis. The pollutant source was a seal processing plant built in 1918 and demolished in 1988 when the commercial seal harvesting ended. Diesel contamination was thought to have been from spillage during fuel handling. An area of approximately 120 feet by 120 feet showed evidence of diesel contamination and extended from the surface to groundwater at 3 to 5 feet. Groundwater movement from the contaminated area threatened uncontaminated wetlands to the west and northwest. The areal extent of contamination was estimated at 10,000 square feet. Leaking aboveground storage tanks and diesel seepage were ongoing into the lagoon from as early as the 1980s. Controls implemented have controlled the sheen; therefore, St. Paul Island Lagoon was removed from the Section 303(d)/Category 5 list in 2008.								
SE	**Category 2**	**10302-502**	**Corner Bay**	**Tenakee Inlet, Baranof Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Tenakee Inlet was placed on the 1998 Section 303(d) list for debris. At that time, dive survey information from May 1996 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.18 acres of bottom coverage. Dive survey reports from June 2002 of 0.1 acre and from July 2001 of 0.6 acre of bottom coverage document that this water is compliant with standards. Tenakee Inlet was removed from the Category 5/(Section 303(d) list 2002/2003.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10204-502**	**Cube Cove**	**NW Admiralty Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Cube Cove was placed on Section 303(d) list in 1998 as impaired for residues from LTF operations. The 1998 Section 303(d) listing criteria required only one dive survey documenting an exceedance of 1.0 acre of continuous coverage bark residues. A January 1998 dive survey documented 9.5 acres of continuous coverage bark on the marine bottom. Subsequent dive surveys document that the Cube Cove LTF has a trend of reduced continuous coverage bark residues. Dive surveys document 1.35 acres in April 2001 and 1.2 acres in December 2002. A February 2004 dive survey documented 0.9 acre of continuous bark residue coverage; therefore, Cube Cove was removed from the Category 5/Section 303(d) list 2004.								

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SE	**Category 2**	**10203-808**	**East Port Frederick**	**NE Chichagof Island**	**0.4 acres**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
East Port Frederick was Section 303(d) listed in 2002/2003 for non-attainment of the residues standard for bark and woody debris. Dive survey information documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985). The operator submitted a remediation plan, which DEC approved on March 14, 2005. The approved remediation plan contained adequate institutional controls to minimize future accumulation of bark and wood waste on the bottom and was expected to result in reducing continuous cover to less than 1.5 acres within a reasonable period of time. EPA approved removing East Port Frederick from the Section 303(d) list as part of Alaska's 2004 Integrated Report to Category 4b. A March 2008, bark monitoring survey report documented 1.74 acres of continuous bark debris. A March, 2009, bark monitoring survey documented a reduction in bark debris to 1.31 acres of continuous bark debris under the1.5 acre impairment standard. A 2010 bark monitoring survey report documented continuous bark coverage of 0.92 acres. Since it is apparent that the remediation plan controls are working and the 2009 and 2010 bark surveys have documented the water is in attainment the water is proposed to be moved from Category 4b to Category 2 in 2012.								
SE	**Category 2**	**10103-031**	**Fubar Creek**	**Prince of Wales Island**	**N/A**	**Sediment**	**Sediment**	**Timber Harvest**

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
In 1993, the Fubar Creek watershed, located on federal National Forest lands, experienced multiple landslides during heavy rain resulting in more sediment to the creek than could be washed downstream. This large influx of sediment negatively affected the ability of the creek to sustain anadromous fish populations. The USFS implemented a recovery plan and Fubar Creek was placed in Category 4b in 1996. No significant commercial harvest activity has occurred within the watershed since the USFS deferred the timber harvest in 1995, and the Fubar Creek watershed was not considered for entry during the next planning cycle for 10-year timber sales. A comprehensive hydrologic condition assessment of the Harris River Basin was completed in 2003. It included a road condition survey that identified 1.2 miles of old logging road that were placed in storage in 2006. Channel condition monitoring was conducted for a number of years. Monitoring assessed trends in geomorphic indicators to determine progress toward channel equilibrium. The watershed-based assessment and the channel condition monitoring helped to guide and prioritize restoration activities in the subwatershed. The USFS Craig Ranger District actively restored vegetation to stabilize landslide areas and the modified the structure and function of riparian timber stands to prevent further sediment input. In 2006 and 2007, USFS restored about 5,500 feet of creek by removing large quantities of sediment from the creek bed, reconstructing the channel, and reestablishing large wood jams and pools to enhance anadromous fish habitat and spawning. Completion of the 2006 work allowed the first perennial flows under the highway bridge in the 13 years since the 1993 landslides. The last phase of active restoration was replacement of the floodplain overflow culverts on the Hydaburg Highway in summer 2008. Monitoring of restoration efforts to restore the anadromous fish habitat included measurement of pool and channel morphology, smolt counts, and observations of adult spawning activity in the restored channel. A summary of the restoration effort and monitoring results was published in 2008. In 2010 the Forest Service Watershed Program initiated a water quality monitoring study as the final step in the restoration and monitoring effort. The purpose of the effort was to document the range and pattern of turbidity and suspended sediment concentrations after completion of the restoration activities. The study found that suspended sediment and turbidity were in the range of natural variability. Fubar Creek is proposed to be moved from Category 4b to Category 2 in the 2012 Report.								
SE	**Category 2**	**10202-601**	**Hamilton Bay**	**Kake**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Hamilton Bay was placed on the 1994 Section 303(d) list for debris. Past dive surveys had indicated that excessive bark existed on the bottom of Hamilton Bay as a result of logging operations on Kupreanof Island that use the Hamilton Bay LTF. Dive survey reports from September 2000 of 0.6 bottom coverage and the June 2002 of 0.6 acre document that this water is compliant with standards. This water was removed from the Category 5/(Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10202-006**	**Hammer Slough**	**Mitkof Island**	**N/A**	**Sediment**	**Sediment**	**Urban Runoff, Gravel Mining**
Hammer Slough was Section 303(d) listed in 1994. DEC staff has coordinated implementation of best management practices (BMPs) for the waterbody from the responsible parties that have resulted in the waterbody attaining WQS. The water quality data in the file support that the waterbody is no longer impaired. DEC staff inspected the Slough in April 2000 and confirmed that BMP implementation has been accomplished and effective in controlling sedimentation and recommended that this waterbody requires no further action. The water was placed in Category 2 in 2002/2003.								

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Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10201-501**	**Hobart Bay**	**Mainland, SE Stephens Passage**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Hobart Bay was placed on the Section 303(d) listed in 1998 for non-attainment of the residues standard for bark and woody debris. Dive survey information from May 1996 (LTF known as Hobart Bay 3) documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 2.3 acres of bottom coverage. 1.3 acres of marine bottom adjacent to the LTF was listed as impaired. A 2007 dive survey documented that the LTF and log storage area (LSA) contained no continuous coverage by bark debris and only a few small patches of discontinuous coverage by bark debris. The December 2007 dive survey and assessment document that this facility is attaining WQS. The water was removed from the Section 303(d) in 2008.								
SE	**Category 2**	**10103-502**	**Klawock Inlet**	**Klawock Island, W. Prince of Wales Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Klawock Inlet's dock and log transfer area was placed on the Section 303(d) listed in 2002/2003 for non-attainment of the residues standard for bark and woody debris. A dive survey conducted by the operator of the facility in February 2004 documented 1.0 acre of continuous residues coverage, and a subsequent dive survey report in November 2004 documents continuous residues coverage at 0.5 acre. Two consecutive dive survey reports document that continuous residue coverage is less than the 1.5-acre impairment standard. Therefore, this waterbody was removed from the Category 5/Section 303(d) list in 2006.								
SE	**Category 2**	**10203-001**	**Nakwasina River**	**Baranof Island, Sitka**	**8 miles**	**Sediment, Turbidity**	**Sediment, Turbidity**	**Timber Harvest**
Nakwasina River was placed on the 1998 Section 303(d) list for non-attainment of the sediment and turbidity standards. Past land use activities had created a number of concerns about water quality and fish habitat. The older historical harvesting of riparian timber and the location and lack of maintenance of the road system created the following conditions: decreased channel stability, landslides and small slope failures, increased sediment levels, loss of aquatic habitat, siltation of holding pools for migrating salmon, and alteration of watershed hydrology. At that time, such unstable watershed effects resulted in impairment for aquatic life uses. The U.S. Forest Service (USFS) submitted a 2-year Water Quality and Aquatic Habitat Restoration Assessment in February 2009, which conducted a paired watershed monitoring study and found that effects were in the range of natural variability and recommended removal from the 303(d) list based on its results. The data demonstrate that turbidity levels have decreased below state WQS. The waterbody was moved to Category 2 in 2010.								

Category 2 Waterbodies

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10202-801**	**Point Macartney**	**Kupreanof Island, Kake**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Point Macartney was placed Section 303(d) listed for residues in 1998. Dive survey information documented an exceedance of bark accumulation level for the interim intertidal threshold (according to the *Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines*, October 21, 1985) from February 2001 at 1.2 acres of bottom coverage. A dive survey report from March 2002 documents 1.0 acre of bottom coverage, and another dive survey report from November 2002 reported 0.52 acre. These findings validate that this water is compliant with standards. This water was removed from the Category 5/ Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10202-602**	**Rowan Bay**	**Kuiu Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Rowan Bay was placed on the 1996 Section 303(d) list for debris (bark debris from deposition at an LTF). Past dive surveys have shown an exceedance of the bark accumulation level for the interim intertidal threshold (according to the *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985). Dive survey reports from May 2002 of 0.8 acre and from June 2001 of 0.6 acre of bottom coverage document that this water is compliant with standards. This water was removed from the Category 5/Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10202-802**	**Saginaw Bay**	**Kuiu Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Saginaw Bay was placed on the 1998 Section 303(d) list for excessive residues associated with an LTF. Dive survey information from 2001 documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.7 acres of bottom coverage. A dive survey report from May 2002 documents 0.7 acre of bottom coverage and validates that that this water is compliant with standards. This water was removed from the Category 5/Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10203-502**	**Saint John Baptist Bay**	**Baranof Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Stain John Baptist Bay was never Section 303(d) listed for debris. Dive survey information from September 2000 documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.32 acres of bottom coverage. Saint John Baptist was considered for Category 5/Section 303(d) listing during the 2002/2003 Integrated Report development process, but the facility came into compliance with the residues impairment standard. A dive survey report from June 2002 documented 0.2 acre of bottom coverage and validates that that this water is compliant with the residues standard.								

Category 2 Waterbodies

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10203-504**	**Salt Lake Bay**	**Port Frederick, Chichagof Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
Salt Lake Bay was placed on the 1998 Section 303(d) list for debris. Dive survey information from October 1991 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the *Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.16 acres of bottom coverage. Dive survey reports from May 2002 of 0.1 acre and from March 2000 of 0.3 acre of bottom coverage document that this water is compliant with standards. This water was removed from Category 5 /Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10303-006**	**Sawmill Creek**	**Haines**	**N/A**	**Residues**	**Debris**	**Urban Runoff**
Sawmill Creek was never Section 303(d) listed for debris, but was placed in Category 4b in 1996. Some debris removal work, in addition to a culvert replacement and reseeding, was completed in 1997. The debris was attributed to highway and maintenance sources. Plans called for moving the stream away from the highway/street in two areas and constructing a dike in another. Plans also called for establishing vegetative buffers, swales, and matting to improve filtration of runoff entering the stream. Priority actions for this water included designing and implementing an interagency watershed assessment and a recovery plan; establishing water quality monitoring objectives and implementing a water quality monitoring plan; and working with City of Haines to review and develop stormwater plans in accordance with EPA and DEC requirements. An extensive residues cleanup was undertaken in 2006 and 2007 and provided removal of 27,000 pounds of scrap metal and 33 bags of trash. The bulk of the debris removed in 2007 was from legacy activities, including abandoned vehicles used for stream bank stabilization. Control measures are in place to prevent similar activities from occurring in the future (state and federal laws), however, more importantly, public acceptance of using abandoned vehicles for stream bank stabilization is no longer tolerated. Enforcement by the City and Borough of Haines police department also has reduced such types of illegal disposal practices. Spring cleanup events occur annually in the City of Haines. DEC does not have the resources to document litter trends. DEC relies on the best professional judgment from state and federal agencies and on credible information from the local watershed group (Takshanuk Watershed Council) to establish whether the creek meets WQS for debris. The majority of debris within the creek, for which the water was placed in Category 4b originally, has been removed. Any remaining or future debris/residues problems are not unlike those of other urban Alaskan waterways and are being addressed by the City of Haines. Consequently, it has been determined that the waterbody meets the residues criterion, and the waterbody was moved from Category 4b to Category 2 in 2008.								

Category 2 Waterbodies

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10212-503**	**Schulze Cove**	**Fish Bay, Baranof Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Storage Area**
Schulze Cove was Section 303(d) listed in 1998 for non-attainment of the residues standard for bark and woody debris. The Schulze Cove LSA covers the whole Cove. Review of USF&WS video documentation and dive report (September 1995 report on dives from July 27 and 29, 1995, several transects) revealed extensive bark deposition (more than 1 acre in area and 10 centimeters [cm] in thickness). Historically, log storage activities have severely affected Schulze Cove. A December 2007 dive survey and assessment documents that this waterbody is attaining WQS and consequently removed from the Section 303(d) list in 2008. The 2007 dive assessment work used a parallel pattern to survey the site and consisted of 17 transects at 300-foot spacing intervals. The sample point frequency was at 300-foot intervals using visual survey methods. The survey documented that the LSA contained no continuous coverage by bark debris and 25.02 acres of discontinuous coverage by bark debris. The 2007 dive survey and assessment documents that this facility is attaining WQS and consequently removed from the Section 303(d) list in 2008.								

Category 2 Waterbodies

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10103-602**	**Thorne Bay (Log Storage Area)**	**Prince of Wales Island**	**N/A**	**Residues**	**Bark & Wood Debris**	**Historical Log Transfer Facility**
The Thorne Bay historical marine LTF, which consisted of both a nearshore log transfer area and an associated LSA, was Section 303(d) listed in 1994 for non-attainment of the residues standard for bark and wood debris. Log transfer and storage activities began in 1962 and caused the accumulation of woody debris on the bottom of the head of Thorne Bay. Log transfer and storage activities ended in 2000, and the operator, USFS, does not plan to resume them; all equipment and facilities have been removed. A key feature of the recovery of the former log transfer and storage area is the Thorne River, which empties into the bay and deposits sediments onto a large sand and gravel delta, where they mix with debris and aid in biological recovery. The Log Storage Area: Dive surveys of the LSA conducted in July 2001 and June 2002 documented 1.1 acres of bark and wood debris on the marine bottom. Dive surveys in 2003 and 2005 detailed the benthic health of 161 acres of the former LSA. Findings included the following: (1) bark debris was mostly decomposed to small fragments and was mixed with natural sediments; (2) the bottom was biologically recovered, exhibiting mostly mature "Stage III" biological communities; and (3) the site was an "extremely healthy coastal embayment." DEC determined, based on the detailed benthic assessment, that the residues standard is met in the former LSA. DEC removed that part of Thorne Bay associated with the LSA from the Section 303(d) list and placed it in Category 2 in 2004. The LSA remained in Category 2 with no known impairments. The Log Transfer Facility: Dive surveys conducted in 1988 and 1990 documented approximately 55 acres of bark accumulation in the LTF. Dive surveys of the LTF conducted in July 2001 and June 2002 documented 2.6 and 1.1 acres of bark and wood debris, respectively, on the marine bottom. An April 2004 dive survey of the LTF documented 6.5 acres of bark and woody debris. The former LTF remained on the Section 303(d) list for a defined area of approximately 35 acres between the LTF shoreline and the boundary of the former LSA established in the 2003-2005 benthic assessment. A December 2007 dive survey documented a reduced area of impaired marine bottom of only 7.5 acres and the rest of the previous area of impairment as meeting the residues criterion and attaining WQS. These findings suggest that biological recovery is proceeding and is well advanced within the area associated with the LTF. A residues TMDL for the Thorne Bay LTF was completed and approved by EPA on May 8, 2007. With the completed TMDL, the LTF was removed from the Section 303(d) list and placed in Category 4a in 2008 with an approved TMDL for residues.								
SE	**Category 2**	**10103-802**	**Tolstoi Bay**	**NW Bight of Tolstoi Bay, Prince of Wales Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Storage Area**
Tolstoi Bay was placed on the Section 303(d) list in1998 for non-attainment of the residues standard for bark and woody debris. A dive survey report from June 1994 for this area (known as Tolstoi Bay 2) reported 1.82 acres of bottom coverage from debris. A March 2003 dive survey report showed 0.7 acre of bark on the bottom. Therefore, the waterbody was removed from the Category 5/Section 303(d) list and moved to Category 2 in 2002/2003.								

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10102-502-002**	**Tongass Narrows 2**	**Tongass Narrows, Eastern Channel, SE of Thomas Basin**	**N/A**	**Residues**	**Seafood Residues, Seafood Processing Wastes**	**Seafood Processing Facility**
Tongass Narrows 2 was placed in Category 4b for residues in 2002/2003. Previously, the seafood processing facility exceeded its 1-acre ZOD standard for residues associated with its discharge permit and was under an EPA compliance order for non-compliance with its waste discharge limitations. Additionally, the facility had discharged seafood sludge, deposits, debris, scum, floating solids, oily wastes, or foam, which alone or in combination with other substances cause a film, sheen emulsion, or scum on the surface of the water. EPA conducted a compliance inspection of this facility in fall 2006. Reports from this compliance inspection found that the ZOD was less than 1.0 acre, at 0.5 acre, and the facility was compliant with the consent decree and its NPDES permit. This waterbody segment is now meeting WQS and was moved from Category 4b to Category 2 in 2008.								
SE	**Category 2**	**10103-503**	**Twelvemile Arm**	**Prince of Wales Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Storage Area**
Twelvemile Arm was placed on the Section 303(d) list in 1998 for non-attainment of the residues standard for bark and woody debris. Review of USF&WS video documentation and a dive transect conducted in 1997 revealed 100% coverage along an entire transect and numerous sections exceeding 10 cm in thickness, i.e., extensive bark deposition (more than 1 acre in are and more than 10 cm in thickness). Log storage activities had been conducted at the head of the arm in a shallow area lacking sufficient flushing capability. The log storage site is inactive and there have been no new sources of residues. A December 2007 dive survey and assessment documented that this water was meeting the residues criterion and attaining WQS. The 2007 survey documented that the LSA contained no continuous coverage by bark debris and only a few small patches of discontinuous cover by bark debris. The use of plan-view video and dive survey methods quantified the extent and type of both continuous and discontinuous coverage as 0.00 acres of bark debris. The 2007 dive survey and assessment documented that this water is meeting the residues criterion and attaining WQS. The water was removed from the Section 303(d) list in 2008.								

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Category 2 Waterbodies – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

Region	*Category*	*AK ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Previous Impairing Pollutant Parameters*	*Previous Impairing Pollutant Sources*
SE	**Category 2**	**10102-601**	**Ward Cove**	**Ketchikan**	**80 acres**	**Toxic & Other Deleterious Organic and Inorganic Substances – Sediment Toxicity**	**Pulp Residues, Logs, Bark & Woody Debris, Sediment Toxicity due to Wood Decomposition By-products**	**Industrial**
Ward Cove was placed on Section 303(d) list in 1990 for dissolved gas (low DO) and residues (debris). DEC and EPA determined that the approved and final ROD of the Superfund cleanup for the "Ketchikan Pulp Company, Marine Operable Unit, Ketchikan, Alaska" (March 29, 2000) were adequate "other pollution controls" for sediment toxicity (4-methyl phenol, ammonia, sulfides) in Ward Cove. Three acres was dredged in the area of concern, in addition to thin capping of approximately 30 acres of the marine bottom. The Superfund "area of concern" of marine bottom was moved to Category 4b. Monitoring in 2004 showed that thin layer capping was successful in eliminating sediment toxicity and stimulating colonization by bottom-dwelling invertebrate species. In May 2009 EPA determined that the Ward Cove sediment cleanup monitoring was complete and objectives had been achieved. Regular monitoring of the sediments since cleanup have shown that cleanup goals have been met. Consequently, the Superfund portion of Ward Cove was moved to Category 2 in 2010.								
SE	**Category 2**	**10203-804**	**West Port Frederick**	**Chichagof Island**	**N/A**	**Residues**	**Bark & Woody Debris**	**Log Transfer Facility**
West Port Fredrick was placed on the 1998 Section 303(d) list for debris. Dive survey information from April 1995 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the *ATTF Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, October 21, 1985) at 1.35 acres of bottom coverage. Dive survey reports from April 2001 of 0.3 acre and from March 2000 of 0.3 acre of bottom coverage document that this water is compliant with standards. The water was removed from the Section 303(d) list in 2002/2003.								
SE	**Category 2**	**10203-018**	**Wrinkleneck Creek Swan Lake**	**Sitka**	**N/A**	**Residues**	**Solid Waste**	**Urban**
Wrinkleneck Creek Swan Lake was placed on the 1996 Section 303(d) list for residues from trash and urban debris. The Swan Lake Watershed Recovery Strategy and TMDL were completed (January 2000) and approved by EPA (May 2000). In 1999 volunteers collected more than 6,600 pounds of trash and debris. In spring 2002, the City and Borough of Sitka (CBS) completed the third annual Swan Lake Cleanup. Each year the amount collected has been lower than previous years. This cleanup will continue to be an annual event in coordination with a citywide spring clean up. The success of these efforts reflects the community's commitment and the approach of the Swan Lake Watershed Recovery Strategy. DEC concluded that Wrinkleneck Creek Swan Lake is attaining standards and placed the waterbody in Category 2 in 2002/2003.								

A. Waterbody Categories 2 through 5

Category 3 Waterbodies

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Integrated Water Quality Monitoring and Assessment Report
Category 3 Waterbodies – Waters for which there is insufficient or no data or information to determine whether the WQS for any designated use are attained

NOTE:

- DEC has insufficient information on the following waters to make an attainment or impairment determination. Data are available upon request.
- Regions are abbreviated as follows: IN – Interior, SE – Southeast, and SC – Southcentral.
- Within the Alaska waterbody identification number (WBID #), the first five numbers indicate in which USGS hydrologic unit code (i.e., HUC") the waterbody is located.

WATER_NAME	ASSESSMENT_UNIT
Allison Creek	AK-20201-001
Anchor River	AK-20301-004_00
Anvil Creek	AK-50104-008_00
Auke Bay	AK-10301-501_00
Auke Lake	AK-10301-403_00
Auke Nu Cove	AK-10301-801_00
Auke Nu Creek	AK-10301-008_00
Barbara Creek	AK-20301-017
Bass Creek (Chuitna River tributary)	AK-20601-002
Battle Creek	AK-20301-029
Beach @ Bluff Point	AK-20301-801
Beach @ City Park	AK-102020-804
Beach @ Douglas Harbor	AK-10301-803
Beach @ Homer Spit	AK-20301-802
Beach @ Kanakanak (Dillingham)	AK-30304-801
Beach @ King Salmon	AK-30204-801
Beach @ Kvichak Bay (Naknek)	AK-30204-802
Beach @ Letnikof Cove	AK-10303-802
Beach @ Lutak Inlet	AK-10303-801
Beach @ Naknek River	AK-30204-803
Beach @ North Kenai	AK-20302-801
Beach @ Petroglyph Beach	AK-10202-806
Beach @ Point Woronzof	AK-20401-801
Beach @ Portage Cove Boat Harbor	AK-10303-803
Beach @ Sandy Beach	AK-10301-805

Beach @ Sandy Beach Park	AK-10202-805
Beach @ Scandinavian Beach	AK-30304-802
Beach @ Snag Point	AK-30304-806
Beach @ West Beach	AK-50104-802
Bear Cove	AK-20301-506
Bear Creek (Becharof)	AK-30203-002_00
Bear Creek (Hogatza)	AK-40608-002
Bear Creek (Homer)	AK-20301-021
Bear Creek (Hope)	AK-20302-013
Bear Creek (Salchaket Slough)	AK-40507-006
Beaver Creek	AK-20302-007_00
Beaver Inlet	AK-30102-608_00
Beaver Lake	AK-20701-406_00
Bell Flats	AK-20701-701_00
Beluga Lake (Homer)	AK-20301--401
Beluga Slough	AK-20301-028
Benny Creek	AK-20301-020
Berners Bay	AK-10301-502
Bidarka Creek	AK-20301-006
Bidarka Creek	AK-20301-006_00
Big Beaver Lake	AK-20505-412
Birch Creek (Talkeetna)	AK-20505-009
Birch Lake	AK-40507-402_00
Black Bear Creek	AK-10103-023_01
Bodenburg Creek	AK-20402-003_00
Bolio Lake	AK-40504-401_00
Bons Creek	AK-50404-002_00
Bradfield River	AK-10101-001_00
Bridge Creek	AK-20301-007_00
Busch Creek	AK-20501-001
Buskin Lake	AK-20701-407
Buskin River	AK-20701-002
Cache Creek	AK-20504-001_00
California Creek	AK-20401-415_00
Camp Creek (Nulato)	AK-40705-002
Canoe Lake	AK-20505-411
Carlanna Creek	AK-10102-003_00
Cedar Bay	AK-20201-501_00
Chatanika River	AK-40509-002
China Poot Bay	AK-20301-601_00
China Poot Creek	AK-20301-013_00
Chuit Creek	AK-20601-003

Chuitna River	AK-20601-001
Clear Creek	AK-20503-001_00
Clearwater Creek	AK-40503-001_00
Clearwater Lake	AK-40503-402_00
Colleen Lake	AK-60402-401_00
Colville River/Umiat Lake	AK-60303-001_00
Conners Lake	AK-20401-408_00
Cook Inlet (upper)	AK-20401-601_00
Cooper Creek	AK-20302-011
Copper River	AK-20104-001_00
Cottonwood Lake	AK-20505-403_00
Crab Bay	AK-10203-501_00
Crow Creek	AK-20401-416_00
Dark Lake	AK-20701-402_00
Deep Creek	AK-20301-002_00
Delong Lake	AK-20401-423
Deshka River (Kroto Creek)	AK-20505-010
Diamond Creek	AK-20301-008_00
Dog Salmon Creek	AK-10103-007_00
Dogfish Bay (Koyuktolik Bay)	AK-20301-018
Donlin Creek	AK-30501-002
Dora Bay	AK-10103-001_00
Dora Lake	AK-10103-401
Dry Creek (Nome)	AK-50104-010
Duck River	AK-20201-002
East Creek	AK-20301-019
Edmonds Lake	AK-20401-424
Eklutna River	AK-20402-403_00
Eldred Passage	AK-20301-501
Elfin Cove	AK-10203-805_00
English Bay River	AK-20301-014
Eyak River	AK-20104-002
Falls Creek (Gustavus)	AK-10302-001
Falls Creek (Kachemak)	AK-20302-101
Finger Lake	AK-20505-404_00
Fire Cove	AK-10103-005_00
Fire Lake	AK-20302-401_00
Fortymile River	AK-40104-001_00
Fourth of July Creek	AK-40401-001_00
Fourth of July Creek (Seward)	AK-20202-002
Fox Creek	AK-20301-012_00
Freshwater Creek	AK-10203-006_00

Fritz Creek	AK-20301-009_00
Funny River	AK-20302-006_00
Gastineau Channel	AK-10301-802_00
Gastineau Channel (Harris and Aurora Harbors)	AK-10301-804
Gibson Cove	AK-20701-605_00
Glacier Creek (Girdwood)	AK-20401-026
Glacier Creek (Kantishna Creek)	AK-40510-002
Glacier Creek (Nome)	AK-50104-011
Goodnews River	AK-30502-004_00
Goose Bay	AK-20505-501_00
Goose Creek	AK-20505-008_00
Goose Lake	AK-20401-409_00
Grant Creek	AK-20302-014
Grant River	AK-30304-003
Greens Creek	AK-10204-001_00
Gulkana River	AK-20102-001
Gunnuk Creek	AK-10202-001_00
Halibut Cove	AK-20301-502_00
Harris River	AK-10103-008_00
Hatchery Creek	AK-10103-009_00
Hawk Inlet	AK-10204-501_00
Herring Bay Creek	AK-10102-004_00
Hidden Lake	AK-20401-410_00
Hideway (Hidden) Lake	AK-20401-010
Hoadley Creek	AK-10102-005_00
Hobart Bay	AK-10201-501_00
Hogatza River	AK-40608-001_00
Homer Harbor	AK-20301-505_00
Horseshoe/Island Lakes	AK-20701-405_00
Hospital Lake	AK-40205-401_00
Iliamna Lake	AK-30206-401_00
Illinois Creek	AK-40703-001_00
Indian River	AK-10203-007_00
Jakolof Bay	AK-20301-011_00
Jim Creek	AK-20402-004_00
Jim Lake	AK-20402-402_00
Johnson Creek	AK-10301-009_00
Jones Lake	AK-20401-405_00
Juneau Creek	AK-20302-003_00
Kachemak Bay	AK-20301-504_00
Kalmbach Lake	AK-20505-410

Kanektok River	AK-30502-001_00
Kantishna River	AK-40510-001
Kasilof River	AK-20301-015
Kaskanak Creek	AK-30206-001
Ketchikan Creek	AK-10102-006_00
Kitkun Bay	AK-10103-003_00
Klehini/Chilkat River	AK-10303-001_00
Klutina River	AK-20102-002
Knutson Creek	AK-30206-004
Kobuk River	AK-50304-001
Kodiak Landfill Creek	AK-20701-001_00
Kogoluktuk River	AK-50302-001
Koktuli River - North Fork	AK-30302-001
Kotzebue	AK-50301-401_00
Kotzebue Estuary	AK-50403-601_00
Kotzebue Lagoon	AK-50301-601
Kuparuk River	AK-60401-001_00
Kuskokwim River	AK-30502-003_01
Lab Bay	AK-10103-803_00
Lake Clark	AK-30205-401_00
Lake Creek	AK-10301-012_00
Lake Louise	AK-20501-401_00
Lake McDermott	AK-60402-402_00
Lake Otis	AK-20401-404_00
Lignite Creek	AK-40508-002
Lilly Lake	AK-20701-404_00
Little Auke Creek	AK-10301-007_00
Little Campbell Lake	AK-20401-413_00
Little Creek, south fork (Nome)	AK-50104-009
Little Susitna River	AK-20505-004_00
Little Tutka Bay	AK-20301-510
Lost and Found Lake	AK-20301-402
Lost Harbor	AK-30102-501
Lower Fire Lake	AK-20401-422
Lower Talarik Creek	AK-30206-002
Lucille Creek	AK-20505-011
Lutak Inlet	AK-10303-602_00
Margaret Creek	AK-10102-002_00
Mariner Creek	AK-20301-026
McClure Bay	AK-20202-601_00
McDonald Creek (Salchaket Slough)	AK-40507-005
McKenzie Inlet	AK-10103-002_00

McKinley Lake	AK-20201-402_00
McNeil Creek	AK-20301-010_00
McRoberts Creek	AK-20402-005_00
Meadow Creek	AK-20505-006_00
Meadow Lake	AK-20401-411_00
Memory Lake	AK-20505-405_00
Mendenhall River	AK-10301-006_00
Millard Bay	AK-20301-508
Mills Creek	AK-20302-001_00
Minook Creek	AK-40404-001_00
Mirror Lake	AK-20401-401_00
Mission Lake	AK-20701-403_00
Montana Creek (Juneau)	AK-10301-002_00
Montana Creek (Talkeetna)	AK-20505-008
Moose Creek	AK-40507-001_00
Moose River	AK-20302-009_00
Mosquito Lake	AK-10303-401_00
Mud Bay (Homer)	AK-20301-520
Mulchatna River	AK-30302-003
Nahodak Creek	AK-20301-022
Nancy Lake	AK-20505-406_00
Nataga Creek	AK-10303-003_00
Neptune Bay	AK-20301-507
Nilumat Creek	AK-30502-002_00
Ninilchik River	AK-20301-005_00
Nome River	AK-50104-003_00
North Twin Lakes	AK-10301-401_00
Nushagak River	AK-30304-002_00
One Mile Creek	AK-10303-002_00
Ophir Creek	AK-10401-001_00
Orca Inlet	AK-20201-801_00
Packers Creek	AK-20702-001
Palmer Creek (Homer)	AK-20301-023
Passage Canal (Whittier Harbor)	AK-20202-501
Pavlof River	AK-10203-004_00
Paxson Lake	AK-20102-401
Peters Creek	AK-20401-001_00
Peterson Bay	AK-20301-503_00
Peterson Creek	AK-10301-010_00
Pile Driver Slough	AK-40507-002_00
Port Clarence	AK-50104-801_00
Port Valdez	AK-20201-602_00

Port Valdez Small Boat Harbor	AK-20201-603_00
Potato Patch Lake	AK-20701-401_00
Potter Creek	AK-20401-021
Power Creek	AK-20201-003
Quartz Creek	AK-20302-008_00
Quartz Lake	AK-40507-401_00
Rabbit Creek	AK-20401-007_00
Red Devil Creek	AK-30501-001_00
Resurrection Creek	AK-20302-002_00
Rice Creek	AK-20301-024
Robe Lake	AK-20201-403
Rock Creek	AK-50104-012
Rogge Creek	AK-40505-001_00
Ruby Creek	AK-20301-025
Russian Creek	AK-20701-003
Sagavanirktok River	AK-60402-001_00
Saint Paul Harbor	AK-20701-503
Salmon Creek	AK-10301-011_00
Salmon River (Hyder)	AK-10101-002
Salmon River (Kinegnak)	AK-30502-005
Salmon River (Platinum)	AK-30502-006
Sawmill Creek (Sitka)	AK-10203-009
Scheffler Creek	AK-20202-004
Schoenbar Creek	AK-10102-007
Seldovia Bay	AK-20301-602_00
Shaw Creek	AK-40507-004
Sheenjek River	AK-40205-001
Shoal Cove	AK-10102-503
Shoal Creek	AK-10102-001_00
Shoemaker Bay	AK-10102-603_00
Shovel Creek	AK-50104-006_00
Sinuk River	AK-50104-004_00
Sitka Channel	AK-10203-807_00
Sitka Sound	AK-10203-806_00
Situk River	AK-10401-002_00
Sleepy Bay	AK-20202-801_00
Slikok Creek	AK-20302-010
Snake River	AK-50104-002_00
Soldotna Creek	AK-20302-004
Solomon River	AK-50104-001_00
Solomon River, East Fork	AK-50104-007_00
South Twin Lakes	AK-10301-402_00

Spring Creek	AK-20402-006
Spring Creek (Seward)	AK-20202-003
Stariski Creek	AK-20301-003_00
Starrigavan Creek	AK-10203-008
Sundi Lake	AK-20401-406_00
Sunshine Cove	AK-10203-809_00
Sunshine Creek	AK-20503-003_00
Suqitughneq River	AK-50101-001_00
Susitna River	AK-20505-007_00
Sweeper Cove	AK-30103-501_00
Sweeper Creek	AK-30103-001_00
Taku River	AK-10301-018
Talkeetna River	AK-20503-002_00
Tanana River	AK-40506-010_00
Thorne River Estuary	AK-10103-603_00
Tisuk River	AK-50104-005_00
Tolstoi Bay	AK-10103-802_00
Tolstoi Bay Watershed	AK-10103-501_00
Tongass Narrows, Refuge Cove	AK-10102-801_00
Town Lake	AK-20102-402
Troutman Lake	AK-50101-401_00
Tubutulik River	AK-50104-013
Turnaround Creek	AK-10203-003_00
Tuxedni Bay	AK-20602-601
Twitter Creek	AK-20301-016
Two Moon Bay	AK-20201-802_00
Ugashik River	AK-30202-001
Unalaska Lake	AK-30102-401_00
Unnamed Creek (Chignik)	AK-20702-002
Unnamed Creek (Chuitna River tributary)	AK-30601-004
Unnamed Creek (City of Kenai)	AK-20302-012
Unnamed Creek (Old Harbor)	AK-20701-004
Unnamed Creek (Petersburg)	AK-10202-002
Unnamed Lake (Chena Hot Springs Rd.)	AK-40506-401
Upper Bonnie Lake	AK-20402-404
Upper Fire Lake	AK-20401-407_00
Walby Lake	AK-20402-401_00
Wasilla Creek	AK-20505-002_00
Wasilla Lake	AK-20505-402_00
Whale Passage	AK-10103-004_00
Whittier Creek	AK-20202-001
Willow Creek	AK-20505-003_00

Winter Harbor	AK-10103-006_00
Women's Bay	AK-20701-802_00
Wood River	AK-30304-001_00
Woodard Creek	AK-20301-001_00
Wrangell Narrows	AK-10202-803_00
Wulik River	AK-50404-003
Zinc Creek	AK-10204-002_00

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 4a**	**40402-001**	**Birch Creek Drainage:- Upper Birch Creek; Eagle Creek; Golddust Creek**	**North of Fairbanks**	**N/A**	**Turbidity**	**Turbidity**	**Placer Mining**
Birch Creek was placed on the Section 303(d) list in 1992 for turbidity as a result of placer mining activity within the drainage. A TMDL was developed and finalized on October 10, 1996 moving Birch Creek to Category 4a in 1998. Priority actions for this water include continued APDES inspections to monitor reduction of discharges from active mine sites, particularly during storm events; continued implementation of reclamation activities in key areas to address high-priority nonpoint source problems, and monitoring at key sites in the drainage to determine the extent of the water quality improvements. The U.S. Bureau of Land Management conducted water quality sampling in 2004, 2005, 2007, 2008, 2009, 2010, and 2011. Data are still being reviewed and will be submitted to DEC when finalized. A water quality publication from the U.S. Bureau of Land Management is expected by the summer of 2012. A review of the data from DEC staff will be completed to determine whether removal from the 4a list is warranted.								
IN	**Category 4a**	**40506-009**	**Garrison Slough**	**Eielson Air Force Base**	**N/A**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Polychlorinated Biphenyls**	**Military Base/ Operations**
Garrison Slough was placed on the 1996 Section 303(d) list for polychlorinated biphenyls (PCBs), a TMDL was developed in 1996, moving Garrison Slough to Category 4a in 1998. Sediment and fish samples from the slough contained elevated levels of PCBs. The source of the PCBs was traced to a drainage ditch. Eielson Air Force Base vacuum dredged and removed most of the upper 18 to 24 inches of soil in the drainage ditch leading into Garrison Slough. Excavation in the drainage ditch extended downward until either groundwater was encountered or field screening results indicated PCB concentrations of less than 10 milligrams per kilogram. A 180-foot section of Garrison Slough was not excavated because an unexploded ordnance was discovered. PCBs at concentrations above DEC cleanup levels are known to remain in the slough sediments. Fish tissue sampling has also occurred. A risk assessment was performed to set maximum contamination levels allowable in fish. As a temporary measure engineering controls were initiated to prevent fish from entering the slough. An additional munitions sweep was conducted in spring 2007 and ensured no other unexploded ordnances existed. Some sediment profiling was conducted in spring 2007, and 2008 and a "Dredge and Cap" removal action is being planned. In the 5-year ROD review, completed in 2008, ADEC and EPA recommended additional actions to address the contamination. The planned remedial action is a high priority for FFY2011. Long term monitoring will consist of sediment sampling and fish tissue analysis.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 4a**	**40506-003**	**Noyes Slough**	**Fairbanks**	**7 miles**	**Residues**	**Debris**	**Urban Runoff**
IN	**Category 4a**	**40506-003**	**Noyes Slough**	**Fairbanks**	**7 miles**	**Petroleum Hydrocarbons, Oil, and Grease**	**Sheens**	**Urban Runoff**
Noyes Slough was placed on the 1994 Section 303(d) list for debris, petroleum hydrocarbons, oil and grease and sediment. A TMDL was developed and finalized for the debris residue in May 2008. A TMDL for petroleum hydrocarbons, oil and grease was developed in 2011. Noyes Slough remains on the Section 303(d) list of impaired waters for sediment. Data is currently being collected and evaluated for the sediment impairment.								
SC	**Category 4a**	**30102-604**	**Akutan Harbor**	**Akutan Island**	**17 acres (0.0266 sq. mi.)**	**Residues**	**Settleable Solids**	**Seafood Processing/ Waste**
SC	**Category 4a**	**30102-604**	**Akutan Harbor**	**Akutan Island**	**17 acres (0.0266 sq. mi.)**	**Dissolved Gas**	**Dissolved Oxygen**	**Seafood Processing/ Waste**
Akutan Harbor was placed on the 1994 Section 303(d) list for residues and dissolved gas. EPA issued a TMDL for Akutan Harbor on February 12, 1995 moving Akutan Harbor to Category 4a in 1998. EPA finalized the associated NPDES permit for this area in spring 1996. In addition to the permit limitations, the seafood processing facility is currently under a consent decree that requires a 12% reduction in 5-day biochemical oxygen demand (BOD5). Water quality sampling during the summer of 2008, 2009, and 2010 as well as a 2011 benthic survey indicate that the water quality standard for dissolved gas in the water column is being met. The harbor remains listed for residual solids that exist in quantities larger than the permitted zone of deposit. The residual solids or residue TMDL remains in effect and will address and impacts in the immediate area from this impairment. Those solids are being actively degraded anaerobicly inside the residual pile and that reduces its size. The current APDES Permit continues to require dissolved oxygen monitoring to ensure that the residual pile does negatively impact or cause an impairment of the water quality standard. The Category 5 dissolved oxygen impairment status for Akutan Harbor is proposed to be removed in 2012, making it a Category 2 waterbody for this pollutant. A TMDL remains in effect for residue on Akutan Harbor. The associated revised NPDES permit has discharge limits consistent with the TMDL.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 4a**	**20505-401**	**Big Lake**	**Wasilla**	**1,250 acres**	**Petroleum Hydrocarbons**	**Total Aromatic Hydrocarbons**	**Motorized Watercraft**
Big Lake was Section 303(d) listed in 2006 for non-attainment of the petroleum hydrocarbons (TAH). A TMDL was completed in May 2012 and approved by EPA in June 2012 and the Big Lake was moved to Category 4a. The impairment was based on sampling collected in the open water months in 2004, 2005 and 2009. Petroleum hydrocarbon (TAH) sampling was conducted in the water column at multiple sites, depths, and degrees of motorized watercraft activity throughout the lake. Sampling sites in areas that received heavier use by motorized watercraft consistently exceeded the WQS for TAH and the concentrations are likely influenced by a combination of good weather and time of season. Specifically, the areas of impairment together equal an estimated 1,250 acres and are seasonal in nature, from May 15 to September 15 with particular impairment issues on two holiday weekends (Memorial Day and Independence Day). The following specific areas in the east basin are the areas of impairment: harbors and marinas, launch areas, and traffic lanes. Sampling was conducted outside these specific areas and exceedances were not identified. Two reports support the impairment listing: *Big Lake and Lake Lucille Water Quality Monitoring Final Report* (September 2, 2004) and *Big Lake Water Quality Monitoring Report* (June 15, 2006). A third report, *Water Quality Monitoring, Big Lake* (January 2009) confirmed the impairment. Although no water quality samples were collected below 5 meters, it is considered unlikely that petroleum contaminated sediment is a concern. The source of petroleum is motorized watercraft. A community working group is actively working on management measures. The TMDL includes a description of the measures.								
SC	**Category 4a**	**20401-004**	**Campbell Creek**	**Anchorage**	**10 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Campbell Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. The Campbell Creek water quality assessment completed by the Municipality of Anchorage in June 1994 investigated several parameters of concern, including temperature, turbidity, zinc, and lead, but concluded that Campbell Creek was water quality limited for FC bacteria only. Water quality sampling was conducted in 2005. A TMDL was developed for FC bacteria and was approved by EPA on June 15, 2006.								
SC	**Category 4a**	**20401-402**	**Campbell Lake**	**Anchorage**	**125 acres**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Campbell Lake was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. The Campbell Creek water quality assessment, completed by the Municipality of Anchorage in June 1994, included an assessment of Campbell Lake. The assessment investigated several parameters of concern, including FC bacteria, lead, and zinc, but concluded that Campbell Lake was water quality limited only for FC bacteria. Water quality sampling was conducted in 2005. A TMDL was developed for FC bacteria and was approved by EPA on June 15, 2006.								
SC	**Category 4a**	**20401-003**	**Chester Creek**	**Anchorage**	**4.1 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Industrial**

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
Chester Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. In April 1993, a water quality assessment was completed on the Chester Creek drainage. Although the assessment identified several parameters of concern for Chester Creek, it was concluded that the waterbody is water quality limited only for FC bacteria. A TMDL for FC bacteria was developed and approved by EPA (dated May 2005).								
SC	**Category 4a**	**30102-606**	**Dutch Harbor**	**Unalaska Island**	**0.5 acre**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Industrial, Urban Runoff**
Dutch Harbor was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. An EPA study in August 1994, *Water Quality Assessment for Greater Unalaska Bay*, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006 . An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for BTEX, PAH, and TOC. Results indicate the water column meets WQS, but several sediment results had surface sheening in exceedance of the standard. The area of impairment has been further refined and reduced as a result of the field sampling and includes two nearshore areas. The area of the harbor that has been found to meet the petroleum hydrocarbons standard has been moved to Category 2. The TMDL for the remaining impaired areas was completed in August 2010 and Dutch Harbor is proposed to move to Category 4a in 2012 . Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.								
SC	**Category 4a**	**20402-002**	**Eagle River**	**Eagle River**	**N/A**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Ammonia, Chlorine, Copper, Lead, Silver**	**Wastewater Treatment Facility**
Although Eagle River was never Section 303(d) listed, a TMDL for the waterbody for ammonia and metals was completed by EPA on April 12, 1995, to support the NPDES permit for the wastewater treatment facility that discharges to the river. The facility continues to operate under an APDES permit.								
SC	**Category 4a**	**20401-005**	**Fish Creek**	**Anchorage**	**6.4 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Fish Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard and the turbidity standard. A 1995 waterbody assessment concluded Fish Creek was impaired only for FC bacteria. A TMDL for FC bacteria was developed and approved by EPA in March 2004.								
SC	**Category 4a**	**20401-006**	**Furrow Creek**	**Anchorage**	**5.3 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
Furrow Creek was placed on the 1990 Section 303(d) list for non-attainment of the FC bacteria standard. Water quality monitoring data from the Municipality of Anchorage show that the levels of FC bacteria exceed the designated use criteria for drinking water, primary contact recreation, and occasionally for secondary contact recreation. The source of the FC bacteria is presumed to be human-caused from urban runoff sources. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	**Category 4a**	**30102-602**	**Iliuliuk Harbor**	**Unalaska Island**	**1.4 acres (0.00218 sq. mi.)**	**Petroleum Hydrocar-bons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
Iliuliuk Harbor was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. An EPA study in August 1994, *Water Quality Assessment for Greater Unalaska Bay*, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for BTEX, PAH, and TOC. Results indicate the water column meets WQS, but several sediment results had surface sheening in exceedance of the standard. The area of impairment has been further refined and reduced as a result of the field sampling and includes nearshore areas around docks and harbors. The TMDL was completed in August, 2010 and Iliuliuk Harbor is proposed to move to Category 4a in 2012. Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.								
SC	**Category 4a**	**30101-501**	**King Cove**	**King Cove**	**N/A**	**Residues**	**Seafood Waste Residue**	**Seafood Processing/ Waste**
King Cove was placed on the 1996 Section 303(d) list for residues. On October 10, 1998, EPA completed a TMDL for King Cove moving the water to Category 4a in 1998. The original listing was based on historical information provided by the Aleutians East Borough and verified by DEC staff . The information included citizen complaints and photographs as well as other indications that persistent exceedances of seafood residues were from seafood processing activity adjacent to the waterbody. The water remains in Category 4a since a TMDL was developed in 1998.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 4a**	**20505-409**	**Lake Lucille**	**Wasilla**	**N/A**	**Dissolved Gas**	**Low Dissolved Oxygen**	**Urban Runoff**
Lake Lucille was placed on the Section 303(d) list for dissolved gas (low DO) and nutrients in 1994. A TMDL for Lake Lucille was completed and was approved by EPA (March 2002) moving the lake to Category 4a in 2002/2003. Priority actions for this water include completion of the development of a TMDL implementation plan, continuation of education on nonpoint source pollution controls, and work with a technical team to determine a water quality sampling plan to monitor nutrients and DO levels. Water quality data collected by DEC in 2004, 2005, and 2006 indicate DO levels have been within Alaska WQS ranges during open water seasons, but below WQS ranges during times of ice cover. In 2011, the City of Wasilla received a grant to complete a demonstration project on the northeast end of the lake to conduct suction dredging and barging of waste materials in an effort to increase lake circulation by removing sediments near the lake's natural groundwater springs. The project is in the permit stage. Additionally, the City will work the DOT during planned upgrades to the Parks Hwy. to upgrade the west stormwater outfall and treatment area to the lake. The City is also considering a 3 year rotational cycle of mowing excessive aquatic vegetation in the lake in an effort to increase dissolved oxygen.								
SC	**Category 4a**	**20401-017**	**Little Campbell Creek**	**Anchorage**	**8.3 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Little Campbell Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. The water quality assessment for the Campbell Creek Drainage indicates that Little Campbell Creek is impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA in March 2004. Additional monitoring completed in 2010 showed a reduction in fecal coliform concentration compared to historical data but concentrations still exceeded state water quality standards.								
SC	**Category 4a**	**20401-024**	**Little Rabbit Creek**	**Anchorage**	**6.2 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Little Rabbit Creek was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	**Category 4a**	**20401-018**	**Little Survival Creek**	**Anchorage**	**3.0 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Little Survival Creek was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. The source of the FC bacteria exceedances has been identified as caused by both human and non-human sources, such as wildlife. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 4a**	**20701-408**	**Red Lake Anton Road Pond**	**Kodiak**	**2.0 acres**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Iron, Manganese**	**Urban Runoff**
Red Lake/Anton Road Pond was placed on the 1994 Section 303(d) list for iron and manganese pollution. A TMDL for metals (iron and manganese) for Red Lake Anton Road Pond was developed in March 2013 and was approved by EPA in June 2013.								
SC	**Category 4a**	**20401-020**	**Ship Creek-Glenn Hwy. Bridge. Down to Mouth**	**Anchorage**	**Glenn Hwy. Bridge. Down to Mouth**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Ship Creek was placed on the 1990 Section 303(d) list petroleum hydrocarbons and PCBs. A TMDL for the FC bacteria impairment on Ship Creek was developed and approved by EPA in March 2004. The petroleum hydrocarbons impairment was removed on 2012.								
SC	**Category 4a**	**30102-603**	**South Unalaska Bay**	**Unalaska Island**	**N/A**	**Residues**	**Seafood Waste Residues**	**Seafood Processing Waste**
SC	**Category 4a**	**30102-603**	**South Unalaska Bay**	**Unalaska Island**	**N/A**	**Dissolved Gas**	**Biochemical Oxygen Demand**	**Seafood Processing Waste**
South Unalaska Bay was placed on the 1994 Section 303(d) list for both settleable solids and DO. EPA issued two TMDLs on February 12, 1995, and revised seafood processing permits to implement TMDL controls moving the bay to Category 4a in 1996. Seafood processors discharging into South Unalaska Bay have been implementing TMDL controls. South Unalaska Bay discharge permits are tracked and monitored by DEC and/or EPA to ensure that waterbody recovery continues, and the seafood processors are fully implementing their revised permit requirements.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 4a**	**30102-607**	**Udagak Bay**	**Unalaska Island**	**N/A**	**Residues**	**Settleable Solids**	**Seafood Processing Waste**
Udagak Bay was placed on the 1994 Section 303(d) list for seafood waste (settleable solids). A nearshore floating pollock processor has discharged seafood waste into Udagak Bay. Because of the poor flushing action in Udagak Bay, two piles of fish waste have accumulated at the bottom of the bay. The accumulations resulted in a violation of the WQS because the seafood general NPDES permit issued in 1989 did not provide for a ZOD. Enforcement action has been taken against the same seafood processors for waste that had accumulated on the shoreline and for floating solids on the receiving water. One floating seafood processor is discharging to this water body. The seafood waste residues (waste pile) are decreasing because of better utilization of the fish product. A TMDL was completed for Udagak Bay on September 30, 1998, and the bay moved to Category 4a in 1998.								
SC	**Category 4a**	**20401-419**	**University Lake**	**Anchorage**	**10 acres**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
University Lake was placed on the 1990 Section 303(d) list for non-attainment of the FC bacteria standard. The Chester Creek Drainage Water Quality Assessment, focusing on an area that included University Lake, was completed in April 1993. It determined that the waterbody was impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA (dated May 2005).								
SC	**Category 4a**	**20401-421**	**Westchester Lagoon**	**Anchorage**	**30 acres**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff**
Westchester Lagoon was placed on the 1990 Section 303(d) list for non-attainment of the FC bacteria standard. The Chester Creek Drainage Water Quality Assessment (which also included Westchester Lagoon), from April 1993, indicated Westchester Lagoon was impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA (dated May 2005).								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10301-005**	**Duck Creek**	**Juneau**	**4 miles**	**Residues**	**Debris**	**Urban Runoff, Landfill, Road Runoff, Land Development**
SE	**Category 4a**	**10301-005**	**Duck Creek**	**Juneau**	**4 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Landfill, Road Runoff, Land Development**
SE	**Category 4a**	**10301-005**	**Duck Creek**	**Juneau**	**4 miles**	**Turbidity**	**Turbidity**	**Urban Runoff, Landfill, Road Runoff, Land Development**
SE	**Category 4a**	**10301-005**	**Duck Creek**	**Juneau**	**4 miles**	**Dissolved Gas, Toxic & Other Deleterious Organic and Inorganic Substances**	**Dissolved Oxygen, Iron**	**Urban Runoff, Landfill, Road Runoff, Land Development**

Duck Creek was placed on the 1994 Section 303(d) listed for dissolved gas (low DO), residues (debris), metals, FC bacteria, and turbidity. TMDLs were completed for all pollutants (turbidity in 1999, FC bacteria and residues in 2000, and DO and iron in 2001), and Duck Creek moved to Category 4a in 2002/2003. Priority actions identified for this water include implementing the Duck Creek Management Plan and actions to address loadings identified in TMDLs; conducting monitoring program to determine whether recovery actions are improving water quality; maintaining stream flow to provide fish rearing habitat in the stream, dilute pollutants, and prevent salt water intrusion; and working with the City and Borough of Juneau and others to ensure adequate stormwater permitting practices and controls are implemented to restore water quality. According to the 2006 final monitoring report ("Watershed Protection and Recovery for Duck Creek, Juneau, AK Project #: ACWA-06-09," Nagorski, Hood, Hoferkamp, July 2006), Duck Creek continued to suffer from low in-stream flow, except for during large precipitation events; DO levels continued to regularly fall below state standards for aquatic life; pH values were centered near and at times below the state water quality standard of 6.5 for aquatic life, at least during the morning sampling events conducted for this study (variations in pH are expected based on time of day and amount of sunlight); and large amounts of iron floc were noted at all sites. Stream cleanup events are typically conducted on a biennial basis to address ongoing residues (debris) issues in high-density corridors. The construction of wetland habitat and channelization of the stream above Nancy Street have produced some improvement to fish and wildlife habitat, reduced turbidity and iron levels, and raised pH and DO in the downstream reach. However, ongoing land use, ordinance enforcement, and snow disposal on private lands adjacent to Duck Creek continue to impair water quality.

Category 4a Waterbodies

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10203-005**	**Granite Creek**	**Sitka**	**2.6 miles**	**Turbidity, Sediment**	**Turbidity, Sediment**	**Gravel Mining**
Granite Creek was placed on the 1996 Section 303(d) list for turbidity and sediment. Data showed that the lower 1.5-mile section of the creek is impaired from sediment and turbidity. A TMDL was completed for Granite Creek and approved by EPA (September 30 2002) moving the creek to Category 4a in 2002/2003. Priority actions for this water include implementing actions identified in the *Granite Creek TMDL Watershed Recovery Strategy and Action Plan* (March 2002). Granite Creek has been monitored for turbidity and total suspended solids (TSS) as part of the TMDL Implementation Plan through ACWA grants since 2001. The turbidity in Granite Creek has improved significantly since BMP controls at the gravel mining operations have been implemented. Practices have included establishing and enforcing a stream setback, recontouring the road and creating vegetated ditches, and stopping operations if a certain amount of rain falls in a set time period. City is ensuring that all permitted and non-permitted activities in the vicinity of Granite Creek are consistent with the loading capacity outlined in the TMDL. Recent monitoring shows the creek is meeting WQS except for isolated storm events. DEC is evaluating the data to see if WQS are persistently met. In addition, the data collected shows the sediment load in the TMDL is not accurate and should be revised.								
SE	**Category 4a**	**10203-603**	**Herring Cove of Silver Bay**	**Sitka**	**102 acres**	**Residues**	**Bark & Woody Debris**	**Log Storage from former Pulp Mill Operations**
The Herring Cove segment of Silver Bay was placed on the 1994 Section 303(d) list. On September 27, 1999, a TMDL was completed for residues for this segment of Silver Bay moving the cove to Category 4a in 2002/2003.								

Category 4a Waterbodies

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10301-004**	**Jordan Creek**	**Juneau**	**3 miles from tide-water upstream**	**Residues**	**Debris**	**Land Development, Road Runoff**
SE	**Category 4a**	**10301-004**	**Jordan Creek**	**Juneau**	**3 miles from tide-water upstream**	**Sediment, Dissolved Gas**	**Sediment, Low Dissolved Oxygen**	**Land Development, Road Runoff**

Jordan Creek was placed on the 1998 Section 303(d) list for debris, dissolved gas (low DO), and sediment. A TMDL was developed and approved by EPA for residues on Jordan Creek and is dated May 2005. A second TMDL was developed and approved by EPA for dissolved gas and sediment in October 2009. Since a TMDL was developed and approved for residues, dissolved gas, and sediment, Jordan Creek was removed from the Section 303(d) and moved to Category 4a for residues. Populations of coho salmon have dropped from an average of 250 adult returns to 54 in 1996 and 18 in 1997. Jordan Creek had been one of the most productive small streams in Juneau and Southeast Alaska for coho salmon, but has experienced a rapid decline. There are serious sediment problems in the stream, leading to poor survival of salmon eggs and low oxygen readings in the substrate that are in violation of WQS. The stream is largely spring fed and cannot transport large volumes of sediment like the higher gradient systems can. The headwaters of the stream are manipulated with ditches replacing more productive habitat and ponds that have been filled in. More recent observations note a problem with iron floc that was not present 10 years ago; however, no hard iron data that might document iron exceedances are available. The stream corridor is under rapid development, and the lower section of the creek regularly goes dry. Macroinvertebrate bioassessment sampling shows the stream has low diversity and experienced declines during the 1994 to 1996 period. A suite of water quality parameters and pollutants, including sediment, pH, DO, and turbidity, were sampled between November 2007 and June 2008. Findings are summarized in the report *Watershed Protection and Recovery for Jordan Creek, Juneau, Alaska* (Nagorski, Hood, Hoferkamp, Neal & Hudson, and July 2008). Biennial "Slash the Trash" cleanup events occur and two Stormwater BMP demonstration sites were installed in 2009 in areas adjacent to the stream to provide information and education to the general public.

Category 4a Waterbodies

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10203-602**	**Klag Bay**	**West Chichagof Island**	**1.25 acres**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Arsenic, Cobalt, Copper, Lead, Manganese, Mercury, Silver, Zinc**	**Mining**
Klag Bay was placed on the 1996 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. A TMDL was developed and approved by EPA on June 1, 2009, for the metals impairments moving the bay to Category 4a in 2010. Past mining resulted in the deposition of large amounts of tailings in Klag Bay. A draft 1985 report (never finalized) on Klag Bay, the *Klag Bay Study*, was prepared by USF&WS and indicated high levels of metals from tailings are leaching into the bay. Contaminants are mercury, arsenic, cobalt, copper, lead, and silver. These metals caused abnormalities in numerous blue mussels. These abnormalities are considered an impairment of a designated use. A preliminary assessment/site investigation (PA/SI) (Ecology & Environment Inc. 1999) and Preliminary Draft Report (Klag Bay waterbody Assessment, Cadmus Group Inc. and CDM, 2008) confirmed lead, silver, arsenic, and mercury in the intertidal sediments above NOAA screening benchmarks.								
SE	**Category 4a**	**10301-001**	**Lemon Creek**	**Juneau**	**6 miles**	**Turbidity, Sediment**	**Turbidity, Sediment**	**Urban Runoff, Gravel Mining**
Lemon Creek was placed on the 1990 Section 303(d) list for turbidity, sediment, and concerns about habitat modification. A waterbody recovery plan that included a TMDL was prepared and approved for this waterbody in fall 1995, and Lemon Creek moved to Category 4a in 1996. Waterbody recovery plan implementation began during fall 1995. The University of Alaska Southeast conducted a sediment assessment. This assessment defined concentrations of natural nonpoint source sediment within Lemon Creek, where active glacial processes contribute to sediment problems. A paired watershed study was conducted from May 2002 through June 2003 to ascertain the roles of glacier processes on watershed sediment discharge. This study concluded that in systems substantially influenced by glacier and mass wasting processes, the traditional TSS-Q (total suspended sediment-stream discharge) relationship is not particularly meaningful because some of the most pronounced sediment events are associated with processes that are not well correlated with stream discharge. Results of this project will also assist with flood control and bank stabilization projects proposed for Lemon Creek. Priority actions for this water include implementing control actions and monitoring as recommended in the TMDL document.								

Category 4a Waterbodies

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10301-014**	**Pederson Hill Creek**	**Juneau**	**Lower two miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Septic Tanks**
Pederson Hill Creek was placed on the 1990 Section 303(d) list for non-attainment of the FC bacteria standard from certain areas of failing onsite septic systems. A final TMDL for FC bacteria was completed for Pederson Hill Creek (dated February 2009) and the creek moved to Category 4a in 2010. FC bacteria contamination had been well documented since 1985, with values as high as 2400 FC/100 ml reported in 1991 (Juneau Streams Monitoring project, DEC/Lab). Monitoring conducted from November 2005 through summer 2006 ("Watershed Protection and Recovery for Pederson Hill Creek, Juneau, AK," Nagorski & Hood, July 2006) found that FC bacteria levels continue to exceed WQS at least on some sites during parts of the year.								
SE	**Category 4a**	**10303-004**	**Pullen Creek (Lower Mile)**	**Skagway**	**Lower mile of Pullen Creek**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Cadmium Copper, Lead, Zinc**	**Industrial**
Pullen Creek was placed in on the 1990 the Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. A TMDL was developed in May 2010 and Pullen Creek moved to Category 4a in 2010. The lower mile of Pullen Creek was previously Section 303(d) listed with the Skagway Harbor listing, but was segmented out into its own listing in the 2006 report. A local nonprofit group completed an environmental assessment on the creek, collecting baseline monitoring data on water quality, flow, and sedimentation and developed an action strategy for Pullen Creek in 2006. Assessment results found no elevated levels of toxics in the water column. Elevated levels of lead, zinc, and barium have been found in stream bottom sediments and adjoining banks. Stream banks, are very stable but elevated levels of metals are found near railroad transport areas where ore was transported in the past. A waterbody recovery plan with BMPs was completed in 2006, and major riparian restoration projects were completed in summer 2009.								

Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10203-601**	**Silver Bay**	**Sitka**	**6.5 acres**	**Residues, Toxic & Other Deleterious Organic and Inorganic Substances**	**Pulp Residues, Logs, Bark & Woody Debris, Sediment Toxicity due to Wood Decomposition By-products**	**Industrial, Historical Pulp Mill Activity**
Silver Bay was placed on the 1994 Section 303(d) listed for non-attainment of residues, toxic and other deleterious organic and inorganic substances, and dissolved gas standards for sludge (residues), toxic substances, and dissolved gas (DO). A report titled *Final Expanded Site Inspection Report, Alaska Pulp Corporation, Sitka, Alaska*, prepared in February 1995, substantiated water quality exceedances. Discharges from the mill ceased in March 1993. Based on a DEC June 1993 Water Quality Assessment, the pollutant parameters of concern were sludge and DO. A contaminated site Remedial Investigation/Feasibility Study for Silver Bay was contracted by Alaska Pulp Company from July 1996 to February 1999. DEC issued a Record of Decision ROD in 1999. The remedial action objective identified by the ROD was natural recovery, with long-term monitoring. A TMDL was developed for Silver Bay in 2003, with waste load allocations for residues and sediment toxicity. Monitoring data show that Silver Bay is no longer impaired for DO. Although DO levels below the limits of the WQS have been observed in deep water between Sawmill Cove and Herring Cove, no correlation between these levels and the presence of wood waste has been identified, and no current source of DO depression is known. Therefore, the DO pollutant parameter was removed from the Silver Bay listing, and no TMDL will be developed for DO. In 1999, a TMDL was completed for residues for the Herring Cove segment of Silver Bay. A TMDL for residues and sediment toxicity was completed in 2003. Based on the 2003 TMDL, Silver Bay was removed from the Section 303(d) list and placed in Category 4a.								
SE	**Category 4a**	**10303-601**	**Skagway Harbor**	**Skagway**	**1.0 acre**	**Petroleum Hydrocarbons, Oils and Grease**	**Petroleum Hydrocarbons**	**Industrial**
Skagway Harbor placed on Alaska's 1990 Section 303(d) impaired waterbody list due to sediment toxicity from metals. Studies concluded that a decrease in infauna diversity in the harbor was present. Additional sampling and analysis in 2007 and 2008 concluded that petroleum hydrocarbons, not metals, are the primary cause for the decrease in infauna diversity in the harbor. ADEC determined that this water is impaired from petroleum hydrocarbons due to its inability to fully support aquatic life. A TMDL was approved in April 2011 by the EPA and the harbor is proposed to be moved to Category 4a in 2012. As part of the TMDL data collection efforts the east harbor (small boat harbor area) was found to be attaining water quality standards.								

Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10103-602**	**Thorne Bay**	**Prince of Wales Island**	**7.5 acres**	**Residues**	**Bark & Wood Debris**	**Historical Log Transfer Facility**
The area of Thorne Bay associated with the historical marine LTF, which consisted of both a nearshore log transfer area and an associated LSA, was Section 303(d) listed in 1994 for non-attainment of the residues standard for bark and wood debris. Log transfer and storage activities began in 1962 and caused the accumulation of woody debris on the bottom of the head of Thorne Bay. Log transfer and storage activities ended in 2000, and the operator, USFS, does not plan to resume them; all equipment and facilities have been removed. A key feature of the recovery of the former log transfer and storage area is the Thorne River, which empties into the bay and deposits sediments onto a large sand and gravel delta, where they mix with debris and aid in biological recovery. The Log Storage Area: Dive surveys of the LSA conducted in July 2001 and June 2002 documented 1.1 acres of bark and wood debris on the marine bottom. Dive surveys in 2003 and 2005 detailed the benthic health of 161 acres of the former LSA. Findings included the following: (1) bark debris was mostly decomposed to small fragments and was mixed with natural sediments; (2) the bottom was biologically recovered, exhibiting mostly mature "Stage III" biological communities; and (3) the site was an "extremely healthy coastal embayment." DEC determined, based on the detailed benthic assessment, that the residues standard is met in the former LSA. DEC removed the LSA from the Section 303(d) list and placed it in Category 2 in 2004. The LSA remains in Category 2 with no known impairments. The Log Transfer Facility: Dive surveys conducted in 1988 and 1990 documented approximately 55 acres of bark accumulation in the LTF. Dive surveys of the LTF conducted in July 2001 and June 2002 documented 2.6 and 1.1 acres of bark and wood debris, respectively, on the marine bottom. An April 2004 dive survey of the LTF documented 6.5 acres of bark and woody debris. The former LTF remained on the Section 303(d) list for a defined area of approximately 35 acres between the LTF shoreline and the boundary of the former LSA established in the 2003-2005 benthic assessment. A December 2007 dive survey documented a reduced area of impaired marine bottom of only 7.5 acres and the rest of the previous area of impairment as meeting the residues criterion and attaining WQS. These findings suggest that biological recovery is proceeding and is well advanced within the area associated with the LTF. A residues TMDL for the Thorne Bay LTF was completed and approved by EPA on May 8, 2007. With the completed TMDL for residues, the area of Thorne Bay associated with the LTF was removed from the Section 303(d) list and placed in Category 4a.								
SE	**Category 4a**	**10301-017**	**Vanderbilt Creek**	**Juneau**	**N/A**	**Turbidity, Sediment**	**Turbidity, Sediment**	**Urban Runoff**
Vanderbilt Creek was placed on the 1990 Section 303(d) list for turbidity, debris, sediment, and with concerns for habitat modification. A waterbody recovery plan that included a TMDL was finalized in 1995 and Vanderbilt Creek moved to Category 4a . Implementation of the waterbody recovery plan began during fall 1995. A local nonprofit group secured state fiscal year 2009 grant funds to remove debris from Vanderbilt Creek. Public education and stream stewardship through promotion and implementation of a Stream Cleanup Day now occur on a yearly basis.								

Category 4a Waterbodies

Alaska's 2012 Final
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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4a**	**10102-601**	**Ward Cove**	**Ketchikan**	**250 acres**	**Dissolved Gas**	**Biochemical Oxygen Demand**	**Industrial**
SE	**Category 4a**	**10102-601**	**Ward Cove**	**Ketchikan**	**250 acres**	**Residues Dissolved Gas**	**Logs, Bark & Woody Debris, Low Dissolved Oxygen**	**Industrial**

Ward Cove was placed on the 1990 Section 303(d) list for non-attainment of the residues and dissolved gas standards from pulp residues, logs, bark and woody debris, and low DO from historical discharges and associated activity from the Ketchikan Pulp Company pulp mill operations. The pulp mill wastewater discharges ceased in 1997 and consequently color was removed from the listing in 1998. Studies indicated that bottom sediments and accumulations of wood debris contribute to seasonal depressions in DO in Ward Cove. Discharge monitoring reports that were required by timber processing discharge permits from 1995 to 2000 showed severe DO depressions at certain times and locations during stratification of the waterbody in late summer and fall. The deeper layer of water more than 5 to 10 meters was below Alaska water quality criteria for DO. These findings provided evidence of an ongoing DO deficit in Ward Cove. The seafood processing facility, which had contributed to DO depressions, has ceased discharging and no new sources or residues from this source are present. A surface DO TMDL for Ward Cove was issued by EPA on May 5, 1994, while the pulp mill was still discharging. Since discharges ceased in 1997 surface water DO has been meeting WQS, Ward Cove has remained Category 5/Section 303(d) listed for non-attainment of the dissolved gas standard for DO below the pinocline (at depth, i.e., for deeper waters). In 2006 the toxicity in Ward Cove was more closely reviewed and more accurately described as "sediment toxicity" from pulp residues, logs, and bark and woody debris operations. An 80-acre area of concern was removed from the Section 303(d) listing for sediment toxicity and placed in Category 4b because DEC and EPA have determined that the approved and final ROD of the Superfund cleanup for the "Ketchikan Pulp Company, Marine Operable Unit, Ketchikan, Alaska" (March 29, 2000) are adequate "other pollution controls" for sediment toxicity in Ward Cove. The Superfund cleanup actions subsequently proved effective, and the area that had been previously impaired from sediment toxicity was moved to Category 2. A TMDL for residues and DO was developed and approved by EPA on May 15, 2007. Consequently, Ward Cove has been placed in Category 4a for residues and dissolved gas (DO).

Category 4b Waterbodies

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Category 4b Waterbodies – Impaired but not needing a TMDL; expected to meet standards in a reasonable time period.

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 4b**	**40501-001**	**Cabin Creek**	**Nabesna**	**1.5 miles**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Manganese, Arsenic, Iron, Copper & Cadmium**	**Mining**

Cabin Creek was placed on the 1996 Section 303(d) list for manganese from the Nabesna Mine Site - a patented mining claim area located on private property within the legislative boundary of Wrangell St. Elias National Preserve. Cabin Creek is located on park lands within Wrangell-St. Elias National Park and Preserve. The U.S. Geological Survey and National Park Service completed a field sampling component of an environmental geochemical site characterization study at the Nabesna Mine in 1997 (results published in USGS PP 1619). National Park Service and DEC staff visited in June 1997 to discuss specifics of a waterbody recovery plan with the owner of the Nabesna Mine property. Acidic mill tailings located down slope of the mill building (situated on both private and National Park Service-managed lands), may be compromising the water quality of Cabin Creek. Elevated metal levels were detected periodically in the Cabin Creek drainage within the one mile reach below the mill tailings.. In 2002/2003 arsenic, iron, copper and cadmium were added to the 1996 Section 303(d) listing. Recovery plan objectives include re-construction of the existing historic drainage ditches around the tailings to divert stormwater and seasonal snow melt run-off away from (bypass) the tailings. The NPS implemented a surface water flow mitigation plan in 2004 and re-directed surface water flows away from the tailings to minimize introduction of metals into Cabin Creek. Visual observations by the NPS indicate that the water flow mitigation work has intercepted 80% of the water that previously flowed across the tailings. Water quality monitoring was conducted during spring run-off in May 2007. The volume of water flowing across the tailings was substantially diminished, which resulted in lower volumes of water carrying dissolved metals. Additional water quality sampling was conducted in 2009 and will be used, among other things, to validate the effectiveness of the on-the-ground- controls. Cabin Creek meets the Category 4b criteria and was removed from Category 5 (Section 303(d) list) in 2004. A Category 4b rationale has been developed and on record and available upon request. NPS is utilizing the CERCLA process to respond to the release of hazardous substances at the Nabesna Mine Site. This response consists of performing a non-time critical removal action (NTCRA). A NTCRA requires the development of an Engineering Evaluation/Cost Evaluation (EE/CA). Through this process, current site conditions and existing data will be duly considered in furthering the removal action selection process. The selected removal action will address unacceptable human health and ecological risks associated with site contaminants. Field activities for the EE/CA investigation were conducted in the fall of 2009. A draft "Supplemental Site Investigation (SSI)" report was developed which detailed sampling results. No groundwater impacts were documented at the site. Surface water impacts downstream include elevated levels of arsenic, copper, lead, and zinc. The NPS conducted a site visit in September of 2011 and found the diversion ditches were functioning as designed and continue to divert surface flow which originates off-site away from the mine tailings. The EE/CA report is expected to be issued in the winter of 2011-2012.

Category 4b Waterbodies

Alaska's 2012 Final

Integrated Water Quality Monitoring and Assessment Report

Category 4b Waterbodies – Impaired but not needing a TMDL; expected to meet standards in a reasonable time period.

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 4b**	**10102-502-001**	**Tongass Narrows 1**	**Tongass Narrows, Eastern Channel, SE of Thomas Basin**	**1.89 acres**	**Residues**	**Seafood Residues, Seafood Processing Wastes**	**Seafood Processing Facility**
Tongass Narrows 1, located in Ketchikan Harbor is proposed for Category 4b in the 2012 report. A review of seafloor surveys (2010-2011) indicates that continuous coverage of seafood residue in excess of 1.5 acres exists at the Trident Seafoods Ketchikan Cannery Plant. The impairment consists of an area of 1.89 acres, encompassing the Trident outfall and zone of discharge. Tongass Narrows 1 meets the Category 4b criteria as the area will be subject to the 2011 EPA-Trident Consent Decree. The decree acts as a recovery plan as it outlines the area of concern, source reduction measures, assessment process, monitoring frequency, and implementation schedule. The plan also has measures to implement alternative remediation measures if source reduction efforts fail to meet water quality standards in the allotted amount of time.								
SC	**Category 4b**	**N/A**	**Exxon Valdez Beaches**	**Prince William Sound -Alaska Peninsula**	**22 beaches**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Exxon Valdez Crude Oil Spill**
Exxon Valdez Beaches were Section 303(d) listed as impaired in 1990. The 22 Exxon Valdez affected beaches and adjacent marine waters were later placed in Category 4b because it was believed that a TMDL process would be redundant to the efforts of the Exxon Valdez Trustee Council (EVOSTC) and restoration projects specified in the Exxon Valdez Restoration Plan. One project, *Assessment of the Areal Distribution and Amount of Lingering Oil in Prince William Sound and the Gulf of Alaska* (conducted by Michel et al, 2007.), was finalized in 2010. The report utilized Geographic Information System (GIS) modeling tools to determine that of 19.36 kilometers of shoreline had the potential to contain lingering oil in the sediment based on a 90% Positive Predictive Value (PPV) of model accuracy. On-going projects associated with recovery monitoring include *The Exxon Valdez Trustee Hydrocarbon Database* (Carls, 2010) , *Lingering Oil on Boulder-Armored Beaches in the Gulf of Alaska 22 Years after the Exxon Valdez Oil Spill* (Irvine et al., 2011-2012), *Evaluation of Recover and Restoration of Injured Nearshore Resources (*Bodkin and Dean, 2010-2014); *Long-term Monitoring: Lingering Oil* (Carls et al, 2011-2016), and *LTM Program-Extending the Tracking of oil levels and weathering (PAH composition) in PWS through time* (Carls et al., 2012). A Category 4b rationale has been developed; it is on record and available upon request. The Exxon Valdez beaches have been placed in Category 4b.								

Category 5/Section 303(d) Listed Waterbodies

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Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed**.**

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 5 Section 303(d) Listed**	**40506-007**	**Chena River**	**Fairbanks**	**15 miles**	**Sediment**	**Sediment**	**Urban Runoff**
Chena River was placed on the 1990 Section 303(d) list for turbidity, petroleum hydrocarbons and oils and grease and for sediment. The identified pollutant source is urban runoff. DEC conducted sampling in 2005, 2007, and 2009 for hydrocarbons and sediment. Data have shown that the Chena River met WQS for the petroleum hydrocarbon standard. Data are currently being collected and reviewed for the sediment standard, and Chena River remains Section 303(d) listed for sediment.								
IN	**Category 5 Section 303(d) Listed**	**40506-002**	**Chena Slough**	**Fairbanks**	**13 miles**	**Sediment**	**Sediment**	**Urban Runoff**
Chena Slough was placed on the 1994 Section 303(d) list for non-attainment of the petroleum hydrocarbons and oils and grease and of sediment standards. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum problem existed and is affecting water quality. File assessment information indicates nonpoint source problems result from the surface water runoff, road construction, site clearing, and dewatering activities from gravel operations. Based on best professional judgment of DEC staff, this water was listed for petroleum products. DEC conducted water quality testing in 2005, 2007, and 2009. Data have shown that the Chena Slough met WQS for the petroleum hydrocarbon standard. Data are currently being collected and reviewed for the sediment standard and Chena Slough remains Section 303(d) listed for sediment.								

Category 5/Section 303(d) Listed Waterbodies

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Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed**.**

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 5 Section 303(d) Listed**	**40402-010**	**Crooked Creek Watershed: Bonanza Creek Crooked Creek Deadwood Creek Ketchem Creek Mammoth Creek Mastodon Creek Porcupine Creek**	**North of Fairbanks**	**77 miles**	**Turbidity**	**Turbidity**	**Placer Mining**
Crooked Creek watershed was placed on the 1992 Section 303(d) list for non-attainment of the turbidity standards. A water quality assessment was completed in August 1995. Monitoring conducted in the early 1990s documented major improvements in water quality. The assessment called for the development of a waterbody recovery plan to restore and maintain habitat quality; however, this plan has not been developed. DEC is currently preparing a monitoring and sampling plan for use in 2012 and 2013. The monitoring results will provide current data that will determine whether a TMDL is needed for these waters.								
IN	**Category 5 Section 303(d) Listed**	**40509-001**	**Goldstream Creek**	**Fairbanks**	**70 miles**	**Turbidity**	**Turbidity**	**Placer Mining**
Goldstream Creek was placed on the 1992 Section 303(d) list for non-attainment of the turbidity standard. A waterbody assessment was completed and confirmed the pollutant and pollutant source. The assessment determined that existing controls were sufficient to address the turbidity issue and that a formal TMDL was not needed. Nevertheless, the water quality assessment was prepared (September 30, 1994) and submitted to EPA for technical review for Goldstream Creek. The assessment contains a section on development of a management plan and a pollution control strategy. No further sampling was conducted until 2010 . Monitoring will continue through 2012.								

Category 5/Section 303(d) Listed Waterbodies

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Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed**.**

Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 5 Section 303(d) Listed**	**30501-004**	**Kuskokwim River (Red Devil)**	**Red Devil**	**1,000 feet, 900 downriver and 100 feet upriver from the mouth of Red Devil Creek**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Antimony, Arsenic, Mercury**	**Mining**
Kuskokwim River was placed on the 2010 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for antimony, arsenic, and mercury. Sampling and data collected in 1971, 1979, 1988, and 1999 have documented exceedances for the metals antimony, arsenic, and mercury. The Red Devil mine site that is causing this impairment is under consideration for the Superfund National Priorities List (NPL) but did not make the NPL in 2011.								
IN	**Category 5 Section 303(d) Listed**	**40506-003**	**Noyes Slough**	**Fairbanks**	**7 miles**	**Sediment -**	**Sediment-**	**Urban Runoff**
Noyes Slough was placed on the 1994 Section 303(d) list for non-attainment of the sediment, petroleum hydrocarbons and oils and grease, and residues standards for sediment, petroleum products, and debris since 1994. Numerous water quality violations have been reported. These violations are a result of debris dumped into the slough. DEC completed a debris assessment in 2007. Data from the assessment were used to complete a TMDL for residues in 2008. Water quality data collected in 2005, 2007, and 2009 determined a TMDL is necessary for the oils and grease and hydrocarbon impairments. A TMDL for petroleum hydrocarbons, oil and grease was approved in 2011. Data are being collected and reviewed for the sediment standard impairment.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 5 Section 303(d) Listed**	**30501-003**	**Red Devil Creek**	**Red Devil**	**0.5 mile of creek**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Antimony, Arsenic, Mercury**	**Inactive Mine**
Red Devil Creek was placed on the 2010 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for antimony, arsenic, and mercury. Sampling and data collected in 1971, 1979, 1988, and 1999 have documented exceedances for the metals antimony, arsenic, and mercury. The Red Devil mine site that is causing this impairment is under consideration for the Superfund National Priorities List (NPL) but did not make the NPL in 2011. The U.S. Bureau of Land Management began sampling, including surface soil, groundwater, sediment and surface water, for a Remedial Investigation Report in 2010. Sampling continued in the summer of 2011 and a final report is expected in late 2011 or early 2012.								
IN	**Category 5 Section 303(d) Listed**	**40510-003**	**Slate Creek**	**Denali National Park**	**2.5 miles**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Antimony, Arsenic**	**Mining**
Slate Creek was placed on the 1994 Section 303(d) list for non-attainment of the turbidity water quality standard because of historic placer mining activities. Current National Park Service (NPS) policy will not permit mining. A recovery plan implementation began in August 1997 and continued through 2002. The recovery plan included restoration objectives for 4 acres of disturbed upland and stream channel areas in the vicinity of the old antimony mine site. Objectives included placement of fill over exposed antimony ore body, reconfiguration of the stream channel, increases in the pH of acidic soils, and revegetation of disturbed soils with willow and alder seedlings. Slate Creek was visited by DEC staff and NPS staff in 2006 for a general site review of the recovery plan implementation that was completed in 2002. The 2006 site visit revealed that the recovery plan was not successful and that in many areas actions implemented were no longer performing their functions properly. NPS staff visited Slate Creek twice in the 2007 field season to gather information to develop an amended recovery concept plan. Amended plans were developed to address the surface and groundwater drainage for erosion control and acidic mitigation. Significant reclamation work was conducted in 2010 and included removal of mining debris, movement of tailings piles, and reconfiguration of the stream channel. NPS and DEC staff conducted a site visit in 2011. In several areas the restoration is failing and much of the vegetation failed to establish. Water quality monitoring by USGS from 2008-2011 indicate that the creek is meeting the turbidity standard, however there are exceedances of antimony and arsenic standards.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
IN	**Category 5 Section 303(d) Listed**	**40510-004**	**Stampede Creek**	**Denali National Park**	**2.3 miles**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Antimony**	**Mining, Abandoned Mine**
Stampede Creek is proposed on the 2012 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for antimony exceedances resulting from past mining activity within Denali National Park and Preserve. The largest antimony producer in Alaska, Stampede Mine, was located near the headwaters of the creek. Mining ceased in 1970 and National Park Service Policy (NPS) will not permit future mining. Historical data collected by NPS from 25 years ago reported exceedances of the antimony standard. More recent sampling conducted by the University of Alaska/Fairbanks (with some funding and support from the NPS) collected within the last five years have confirmed antimony exceedances have persisted. Currently, there are fine tailings in the banks of Stampede Creek and tailings piles adjacent to the creek. Therefore the water is proposed for Section 303(d) listing in 2012.								
SC	**Category 5 Section 303(d) Listed**	**30101-500**	**Cold Bay**	**King Cove, Alaska Peninsula**	**0.01 acre**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Military, Fuel Storage**
Cold Bay was placed on the 1998 Section 303(d) list for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. Enough evidence exists to indicate that water quality violations occurred on a persistent (though intermittent) basis. Because the cleanup of petroleum contaminated soils at the Cold Bay formally used defense site is considered a high-priority project, USACE completed an assessment and recovery plan. A release investigation of the seep at the foot of the high sea bluff found high levels of DRO in beach soils (more than 10,000 parts per million) and petroleum contamination in sediments below the high tide line. Four feet of free product was found in a monitoring well in the bluff. The seep weeps a mixture of petroleum and water intermittently along 100 to 300 feet of bluff. In the summer of 2002, USACE used a pilot test to evaluate several passive and active technologies for recovering product before it would reach the waters of Cold Bay. The results of this test were used to develop a feasibility study to determine the best solution for the beach seeps. The feasibility study was completed in 2003. In accordance with the Record of Decision document the USACE agreed to dig and treat petroleum contaminated soil to 15 feet. Contaminated soil below 15 feet will undergo in situ treatment. Soil excavation and treatment were conducted in 2006. For the drum disposal and beach seep area, a two-phased approach was selected. In summer 2006, soil 15 feet below ground surface and above was excavated and thermally treated. In 2007, USACE installed bioventing, soil vapor extraction (SVE) and high vacuum extraction (HVE) wells to continue remediating the area. The amount of contamination discharging to the beach decreased markedly. DEC's Contaminated Sites Program reports that the petroleum sheen is getting smaller every time inspections are made on site. The Contaminated Sites receives monthly reports showing the amount of free product recovered and petroleum product degraded as a result of the SVE and HVE systems in operation. In July 2009, the USACE reassessed the petroleum seep at the foot of the beach bluff. They found the longitudinal area of the seep has reduced by two-thirds since it was last evaluated in 2007.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 5 Section 303(d) Listed**	**20505-001**	**Cottonwood Creek**	**Wasilla**	**7 miles**	**Fecal Coliform Bacteria**	**Fecal Coliform Bacteria**	**Urban Runoff, Unspecified Septic Sources**
Cottonwood Creek (13 miles) was placed on the 2002/2003 Section 303(d) listed for non-attainment of the residues standard for foam and debris in 2002/2003. DEC has received numerous complaints about foam in Cottonwood Creek and foam was observed in the creek in 1998, 2000, 2001, and 2002. An intensive water quality evaluation was conducted on commencing in September 2004. Water quality sampling conducted in 2004, 2005 and 2006 indicated that the foam present in Cottonwood Creek is naturally occurring and to be meeting WQS. Foam was determined to be influenced by natural conditions. Continued water quality sampling in 2006 focused on determining the extent of FC bacteria and temperature exceedances discovered during the sampling for foam, as well as further investigation of the foam. Foam and temperature were determined to be naturally occurring hence meeting WQS. FC bacteria exceeded WQS, and the source(s) is unknown. DEC conducted a study in 2010 using Microbial Source Tracking to determine if detected bacteria were from humans, *Fecal Coliform Bacteria Source Assessment in the waters of Cottonwood Creek, Wasilla, and Little Campbell Creek, Anchorage* (November 2010). Results indicate that humans are a source to the increase FC bacteria in Cottonwood Creek. Cottonwood Creek is now in Category 2 for attainment of the residues (foam) standard and impaired for FC bacteria.								
SC	**Category 5 Section 303(d) Listed**	**30203-001**	**Egegik River**	**Egegik**	**0.25 mile**	**Petroleum Hydrocarbons, Oil & Grease**	**Petroleum Products**	**Spills, Fuel Tanks, Under-ground Fuel Tanks**
Egegik River was placed on the 2002/2003 Section 303(d) listed for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. Contamination from at least three major sources has migrated into the groundwater and through soils into the Egegik River: the former locations of two 10,000 gallon gasoline tanks, an unlined diesel tank farm, and the underground threaded-coupling pipeline from the tank farm on the bluff that leaked gasoline in April 2001. The area used to house fuel tanks and was filled from a barge in the river. Extensive contamination is suspected. Site characterization of the entire site has not been completed. It is believed that the old fuel tanks were in place and active from the 1960s through the 1990s and continue to be a problem. The river inundates the soils behind the seawall (which are contaminated) regularly when the tide comes up. The monthly high tides usually breach the seawall and flood the area. Fuel from the April 2001 gasoline spill reaches the water continuously. It appears that the groundwaters are hydrologically connected to the river and that the fuels will continue to migrate to the river. Photographic documentation shows petroleum daylighting into the river and sheen on the water. The problem is likely to remain chronic unless the contaminated soils are excavated and free product recovery is completed.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 5 Section 303(d) Listed**	**20401-412**	**Hood/ Spenard Lake**	**Anchorage**	**307 acres**	**Dissolved Gas**	**Low Dissolved Oxygen**	**Urban Runoff, Industrial**
Hood/Spenard Lake was originally Section 303(d) listed in 1992 for non-attainment of the FC bacteria standard and in 2002/2003 for low DO. The waterbody was also placed on the 1992 Section 303(d) list for FC bacteria, lead, nitrates, and phosphates. A TMDL was developed for FC bacteria in 1997, and the waterbody remained on the Section 303(d) list (Category 5) for dissolved gas (i.e., low DO). A later DEC water quality assessment also assessed the four other pollutants of concern: petroleum, nitrates, lead, and ammonia. However, the data indicated that there are no persistent violations of these parameters. Priority actions identified for this water include Ted Stevens Anchorage International Airport (TSAIA) shunting away much of the stormwater from the tarmac and installation of retention ponds to treat stormwater coming from the parking lots; future construction to improve drainage in the area; tracking of ongoing stormwater rerouting projects and water quality sampling being done by TSAIA; and conducting monitoring of nutrients and stormwater BMP effectiveness. TSAIA submitted and DEC approved a waterbody recovery plan for Hood/Spenard Lake. The recovery plan has three components: (1) a reduction in the amount and placement of urea, (2) an increase in glycol recovery, and (3) diversion of stormwater contaminated by glycol and nutrients stormwater from the waterbody. Review of water quality data from 2000 to 2009 shows that the waters are meeting the FC bacteria standard and Hood/Spenard Lake is in Category 2 for meeting the FC bacteria standard. Dissolved oxygen concentrations have improved over the same time period and have tracked the predictive modeling in the waterbody recovery plan. Implementation of that waterbody recovery plan predicted that Hood/Spenard should recover in 8-10 years from its 2002 implementation timeframe. Recent data done by TSAIA from 2010 to 2011 have shown the lakes meeting the water quality standard for DO, but have not yet provided sufficient data to move the water to Category 2.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 5 Section 303(d) Listed**	**20402-001**	**Matanuska River**	**Palmer**	**½ mile**	**Residues**	**Debris**	**Landfill**
Matanuska River was placed on the 2002/2003 Section 303(d) list for non-attainment of the residues standard for debris. An active open dump is located on and in the Matanuska River just north of Eagle Drive in Palmer. Numerous derailed railroad cars are visible in the river and riparian area. The main site of concern is the active dump. Visible contents of the dump at the time of the inspection were a minimum of 20 vehicles, household refuse and items, fuel cans, possible 55-gallon drums with unknown contents, grass cuttings, and scrap metal and other debris. Debris continues in the river and riparian area upstream for approximately 1/2 mile. River channels run through and next to the dump at all times of the year. Visible sheens have been observed in the river. This open dump is not only an immediate threat to the surface water quality of the Matanuska River, but is within the Drinking Water Protection Area for a minimum of three public water systems. In August 2004, DEC conducted a site assessment study. Activities included characterizing and quantifying the debris, mapping the site, and conducting surface water, sediment, and soil samples. No hazardous or petroleum contamination was discovered. After characterizing the debris, options were developed for possible debris removal as part of the study. Following subsequent meetings with involved parties, in March 2005 USACE issued a jurisdictional declaration that the railroad cars that are below ordinary high water serve as bank stabilization material. As such, these items are no longer in violation of WQS. However, the remaining debris on the slope above ordinary high water has a potential of entering the water column, and the upper layers are not considered bank stabilization material. The Alaska Railroad Corporation, as the property owner, needs to work with DEC Solid Waste staff on developing a plan with goals and a timeline delineating its commitment to cleaning up the site. The Railroad has agreed to install jersey barriers to prevent vehicular access and erecting signage prohibiting access and dumping.								
SC	**Category 5 Section 303(d) Listed**	**30101-502**	**Popof Strait**	**East Aleutians Borough**	**4.73 acres (0.0073906 sq. mi.)**	**Residues**	**Seafood Waste Residue**	**Seafood Processor**
Popof Strait was placed on the 1996 Section 303(d) listed for non-attainment of the residues standard from seafood waste residues. Information provided by the Aleutians East Borough, and verified by DEC staff, included citizen complaints, photographs, and other indications that persistent exceedances of "seafood residue" occur from a seafood processor operating adjacent to the waterbody. The seafood processing facility located in Sand Point has installed a fish meal plant that reduces the discharge of solid wastes to Popof Strait. The company is currently under a consent decree for BOD_5 covering this facility (as well as the one in Akutan) where there is a BOD_5 limit for the Sand Point facility. An April 2000 dive survey report documented 3.0 acres of residues in excess of the permitted facility's authorized 1-acre ZOD. A 2011 dive survey documented 4.73 acres of seafood residues on the marine floor, an increase of 0.83 acres since the last dive survey.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 5 Section 303(d) Listed**	**10204-501**	**Hawk Inlet**	**NW Admiralty Island**	**0.002 square miles**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Cadmium, Copper, Lead, Mercury, and Zinc**	**Mine, Ore Transfer Facility**
The area in Hawk Inlet immediately around the Greens Creek Mine Ore Concentrate Loading Area is proposed for the 2012 Section 303(d) list for non-attaiment of toxic and other deleterious organic and inorganic substances (Metals; Cadmium, Copper, Lead, Mercury, and Zinc) for marine water uses. In 1989, the first attempt to load a barge with ore concentrate resulted in a spill of this concentrate into Hawk Inlet. In 1995 a suction dredge was used to remove as much of the spilled ore concentrate as possible. Prior to Greens Creek operations a fire in 1974 at the cannery dock left debris on the floor of the inlet at the ore concentrate loading site. This debris complicated cleanup efforts and liter-sized pockets of concentrate now remain in various locations. Prop-wash from tug boats maneuvering barges and ore ships during loading operations continues to re-suspend and mix concentrate with natural sediment in the vicinity of the spill, best management practices, including an enclosed conveyor, now minimize the potential for another spill to take place. Marine sediment sample locations in the immediate vicinity of the Ore Concentrate Loading Area exceed NOAA SQuiRT Effect Range Low (ERL) screening benchmarks for marine sediment for cadmium, copper, lead, mercury, and zinc. Marine water sampling indicates that the water column meets State water quality standards. The area of concern is 350' in length by 150' in width. The total area of concern is 42,000ft² in size (L x W x 0.8) or 0.962187 acres. This was determined by establishing a perimeter around the loading dock that encompasses the sampling locations.								
SE	**Category 5 Section 303(d) Listed**	**10203-002**	**Katlian River**	**N. of Sitka, Baranof Island**	**4.5 miles**	**Sediment, Turbidity**	**Sediment, Turbidity**	**Timber Harvest**
Katlian River was placed on the Section 303(d) listed in 1998 for non-attainment of the sediment and turbidity standards. Past land use activities have created a number of concerns about water quality, and fish habitat. The harvest of riparian timber and location and lack of maintenance of the road system created the following concerns: decreased channel stability, landslides and small slope failures, increased sediment levels, loss of aquatic habitat, siltation of holding pools for migrating salmon, and alteration of watershed hydrology. Watershed effects resulted in use impairment for aquatic life.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 5 Section 303(d) Listed**	**10203-010**	**Kimshan Cove**	**N. of Sitka, Baranof Island**	**0.028125 sq. miles (18 acres)**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Arsenic, Cooper, Lead, Mercury**	**Abandoned Mine**
Kimshan Cove is proposed to be placed on the 2012 Section 303(d) list for non-attainment of toxic & other deleterious organic and inorganic Substances, specifically metals. The Kimshan Cove Mine site is located on the east shore of Kimshan Cove on the North side of Doolth Mountain. A Combined Preliminary Assessment/Site Inspection Report (PA/SI) was conducted in 1999 and submitted to the Region 10 Superfund Technical Assessment and Response Team (START). The PA/SI provided background, sampling information, and a summary of investigation findings and conclusions. Marine and freshwater sediments were sampled in the PA/SI. The tailings piles associated with the mine are located in the intertidal and subtidal area and estimated to contain approximately 140,000 tons of material with an additional 70,000 tons in the upland area. This site is listed in the Department of Environmental Conservation Office of Spill Prevention and Response (SPAR) Database of Contaminated Sites. The SPAR program reports that the upland property owner has been contacted about said metals contamination and that further characterization and/or clean-up will be required. Marine sediment concentrations exceed NOAA SQuiRT screening benchmarks for arsenic, lead, and mercury by an order of magnitude in numerous locations.								
SE	**Category 5 Section 303(d) Listed**	**10103-504**	**Salt Chuck Bay**	**Kasaan Area, Prince of Wales Island**	**0.03 square miles**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals - Copper**	**Mining**
Salt Chuck Bay was placed on the 2010 Section 303(d) for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. The Salt Chuck Mine was listed by the EPA on the Federal Agency Hazardous Waste Compliance Docket and published in the *Federal Register* on June 27, 1997, because studies indicated physical and chemical hazardous to the public and environment. At the request of USFS, URS Engineering initiated an Engineering Evaluation/Cost Analysis of the site in 2002 and conducted additional data collection and investigation in 2006. On September 23, 2009, the Salt Chuck Mine was proposed for addition to the EPA National Priorities List. Copper concentrations found in the intertidal water column exceed state WQS. In addition sediment/tailings found in the intertidal zone exceed NOAA SQuiRTS screening benchmarks for sediment quality.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 5 Section 303(d) Listed**	**10103-010**	**Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3027 (Stream 3)**	**Prince of Wales Island**	**0.4 mile**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals - Aluminum, Cadmium, Copper, Iron**	**Road Construction**
Stream 3 was placed on the 2010 list Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants exceeding WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, and iron. These exceedances are considered an impairment of a designated use.								
SE	**Category 5 Section 303(d) listed**	**10103-012**	**Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3021 (Stream 6)**	**Prince of Wales Island**	**1.14 mile**	**Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances**	**Metals – Aluminum, Cadmium, Copper, Iron, Manganese, Sulfate**	**Road Construction**
Stream 6 was placed on the 2010 Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, and manganese. Sulfate is included in the list of contaminates for this waterbody. These exceedances are considered an impairment of a designated use.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 5 Section 303(d) listed**	**10103-013**	**Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 tributary (Stream 7)**	**Prince of Wales Island**	**0.3 mile**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals - Aluminum, Cadmium, Copper, Iron, Manganese**	**Road Construction**
Stream 7 was placed on the 2010 Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, and manganese. These exceedances are considered an impairment of a designated use.								
SE	**Category 5 Section 303(d) listed**	**10103-014**	**Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 (Stream 8)**	**Prince of Wales Island**	**0.3 mile**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals - Cadmium, Copper, Iron, Manganese, Nickel, Zinc**	**Road Construction**
Stream 8 was placed on the 2010 Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include cadmium, copper, iron, manganese, nickel, and zinc. These exceedances are considered an impairment of a designated use.								

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Region	*Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SE	**Category 5 Section 303(d) listed**	**10103-015**	**Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3017 tributary (Stream 9)**	**Prince of Wales Island**	**0.8 mile**	**Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances**	**Metals-Aluminum, Cadmium, Copper, Iron, Manganese, Nickel, Sulfate, Zinc**	**Road Construction**
Stream 9 was placed on the 2010 Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, manganese, nickel, and zinc. Sulfate is included in the list of contaminants present on this waterbody. These exceedances are considered an impairment of a designated use.								

APPENDIX B Waterbodies Removed From the Section 303(d) List

Section 303(d) Listed Waterbodies in 2010 Removed from the List in 2012

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Region	*New Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 2**	**20201-401**	**Eyak Lake**	**Cordova**	**50 feet of shore-line**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products, Petroleum Contamination, Sheen**	**Above Ground Storage Tanks, Spills**
REASON FOR REMOVAL: No impairment from petroleum hydrocarbons; waterbody is attaining water quality standards. Reason for original Section 303(d) listing was inaccurate.								
Eyak Lake was placed on the 2002/2003 Section 303(d) list for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. Remedial actions at the Cordova Electric Power Plant on Eyak Lake, including a groundwater pump-and-treat system and passive product collection, have been effective at eliminating sheen on the surface of the lake, which was last observed in 2005. Groundwater treatment and monitoring is anticipated to continue at this site in the future. In 2005 and 2006, two water quality studies were completed on the lake. Although these studies showed the lake meeting standards, local residents expressed other petroleum-related concerns. Additional evaluation was warranted, and a study, started in 2009 verified if sheens were present and whether they were natural or anthropogenic. The report was completed in 2010. The report concluded that the sheens are the product of soil bacteria and not from anthropogenic sources. DEC removed Eyak Lake from the Category 5/Section 303(d) list and placed the water in Category 2 in 2012.								

B. Waterbodies Removed From the Section 303(d) List

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Integrated Water Quality Monitoring and Assessment Report
Section 303(d) Listed Waterbodies in 2010 removed from the List in 2012.

Region	*New Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 4a**	**20701-408**	**Red Lake Anton Road Pond**	**Kodiak**	**2.0 acres**	**Toxic & Other Deleterious Organic and Inorganic Substances**	**Metals – Iron, Manganese**	**Urban Runoff**
REASON FOR REMOVAL: A TMDL was developed and the TMDL was approved by EPA on June 28, 2013								
Red Lake and Anton Road Pond was placed on the 1994 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metal. Based on a 1992 memorandum released by DEC Kodiak Field Office, Red Lake lies less than 200 feet from a Navy landfill. This landfill was constructed without a liner or leachate collection system. Landfill waste, which may include solvents, paints, used oils, and contaminated fuel, occasionally leaches into Red Lake and another small pond near Anton Road. Anton Road Pond is highly colored by bright orange-red iron precipitates caused by the oxidation of the leachate. Lake sediment samples were found to contain 8.6% iron. Chemical pollutants were documented at low levels in the lake and in the bottom sediments. DEC staff reviewed four reports from 1996 and 1997. The data presented in the reports are the best available. DEC concluded that (1) Red Lake clearly appears to have exceedances of WQS for iron and manganese because of human actions; (2) no existing controls are in place to ensure that the WQS will be met in a reasonable time period; (3) because the reports did not present any information showing levels of iron and manganese in groundwater above the landfill, no information shows that the abandoned landfill is not the source of these metals; and (4) although there were other parameters of concern observed in previous sampling, the available information indicates that Red Lake should only be listed for manganese and iron.								

B. Waterbodies Removed From the Section 303(d) List

Alaska's 2012 Final
Integrated Water Quality Monitoring and Assessment Report
Section 303(d) Listed Waterbodies in 2010 removed from the List in 2012.

Region	*New Category*	*Alaska ID Number*	*Waterbody*	*Location*	*Area of Concern*	*Water Quality Standard*	*Pollutant Parameters*	*Pollutant Sources*
SC	**Category 2**	**20401-020**	**Ship Creek**	**Anchorage**	**11 miles**	**Petroleum Hydrocarbons, Oils & Grease**	**Petroleum Products**	**Urban Runoff**
REASON FOR REMOVAL: No impairment from petroleum hydrocarbons; waterbody is attaining water quality standards. Reason for original Section 303(d) listing was inaccurate.								
This segment of Ship Creek was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons and oils and grease standard. Petroleum products floating on groundwater were believed to be moving toward Ship Creek and threatening the waterbody. In addition, fecal coliform (FC) bacteria monitoring data from 1989 to 1994, provided by the Municipality of Anchorage, exceeded WQS. In 1992 FC bacteria was added to the Section 303(d) listing as an impairing pollutant. The final FC bacteria TMDL was approved by EPA in May 2004. An EPA consent decree with the Alaska Railroad Corporation (ARRC) required groundwater monitoring. The monitoring has shown that petroleum product constituents do not pose a threat to the creek. In addition, DEC conducted monitoring to determine if a persistent sheen existed. This monitoring demonstrated that there was not a persistent sheen, nor were the analytical indicators for petroleum hydrocarbons present in sufficient concentration to exceed the water quality standard. Therefore, the petroleum hydrocarbons impairment was removed in 2012. Ship Creek remains in the impaired Category 4a with a FC bacteria TMDL.								

APPENDIX C TMDL Schedule and Factors

Alaska TMDL Completion Date Schedule (Revised 11/11)

NOTE: The years shown are from July 1 to June 30. It is expected that for any given year, the TMDL will be completed by June 30 of the year that identifies the row in which the waterbody is shown. During TMDL development, it may be determined that a TMDL is not needed if the waterbody has recovered or adequate restoration actions are ongoing.

Alaska's approved and final TMDLs can be found here
http://dec.alaska.gov/water/tmdl/approvedtmdls.htm

Completion Date	Southeast	Southcentral	Interior/North Slope
2012			Chena River
			Chena Slough
			Noyes Slough (sediment)
2013		Hood/Spenard Lake	Goldstream Creek
		Matanuska River	
2014	Katlian River	Popof Strait	
		Cottonwood Creek	
		Cold Bay	
2015			Crooked Creek Watershed
			Slate Creek
			Stampede Creek
2016	Salt Chuck Bay		Kuskokwim River (Red Devil)
	Coffman Cove Creeks: --Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3027 (Stream 3) --Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3021 (Stream 6)		Red Devil Creek

	--Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 tributary (Stream 7) --Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 (Stream 8) --Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3017 tributary (Stream 9)		
2017	Hawk Inlet		
	Kimshan Cove	Egegik River	

Factors Considered in Alaska's 2012 TMDL Schedule Revision

All Alaska Category 5 Section 303(d) listed waters for the 2012 Integrated Water Quality Monitoring and Assessment Report are scheduled for development of TMDL between 2012 and 2017. The TMDLs for these waterbodies are scheduled based on DEC's consideration of the factors listed below. These factors are not necessarily listed by priority and may be used in conjunction with one another, combined with other project management decisions, or both.

- Severity and persistence of pollutant sources, exceedances of WQS, and/or impacts to the beneficial uses of the waterbody.
- Significance of the waterbody in terms of public and resource values.
- Degree of public, industry, and agency interest in accomplishing the TMDL so that allocations and required controls or permit limits can be known.
- Applicability of existing pollution controls, waterbody recovery plans, and APDES discharge permits.
- Technical feasibility and difficulty of developing the TMDL. Development of some TMDLs requires much more time and resources than for other TMDLs, and agency resources have annual limits of time available for TMDL development. Factors that increase the amount of time include waterbodies with uncommon types of impairments for which model TMDLs are not available; TMDLs that require complex models and loading calculations; and TMDLs on waters with many stakeholders who will be significantly affected by loading allocations.
- Availability and accuracy of water quality information necessary for assessing the water and making loading determinations. TMDLs for which little data are available are scheduled later so that essential data can be acquired.

- Waters where pilot BMPs or other controls are being implemented and monitored. TMDL development on these waters may be delayed so that improved loading allocations can be made based on performance of the controls.
- Likelihood that proposed restoration efforts might occur in a reasonable time period that, if they occur, may make TMDL development unnecessary.
- Development of stakeholder plans that may satisfactorily substitute for (or supplement) a waterbody's TMDL. Examples include a contaminated site remediation plan or another agency's assessment and restoration plan. TMDL development may be scheduled to occur shortly after completion of such plans if they will include information that satisfies what is required in the TMDL.
- Development of multiple TMDLs as part of a unified effort. These situations include development of TMDLs that address similar pollutants and approaches, waters in the same watershed or area, same stakeholders, and similar restoration actions.
- Length of time the water is on the impaired waters list.

The paragraphs below describe important terms.

TMDL—A total maximum daily load plan is a "pollution budget" designed to restore the health of a waterbody. A TMDL calculates the amount of a specific pollutant that a waterbody can receive and still maintain Alaska's WQS.

TMDL load allocation— The portion of the loading capacity attributed to (1) the existing or future nonpoint sources of pollution and (2) natural background sources. Wherever possible, nonpoint source loads and natural loads should be distinguished.

NPDES or APDES permits limits—National Pollutant Discharge Elimination System permit limits and Alaska Pollutant Discharge Elimination System permit limits establish the amount of pollutants a wastewater facility can discharge to the environment and still maintain Alaska's WQS.

WQS—The Alaska state water quality standards are guides to help create programs that protect and restore water quality in Alaska. These programs include the impaired water body list and the nonpoint source pollution program. The standards also help set the limits for state and federal discharge permits and cleanup standards for contaminated sites and landfills.

APPENDIX D Logic Flow Diagram

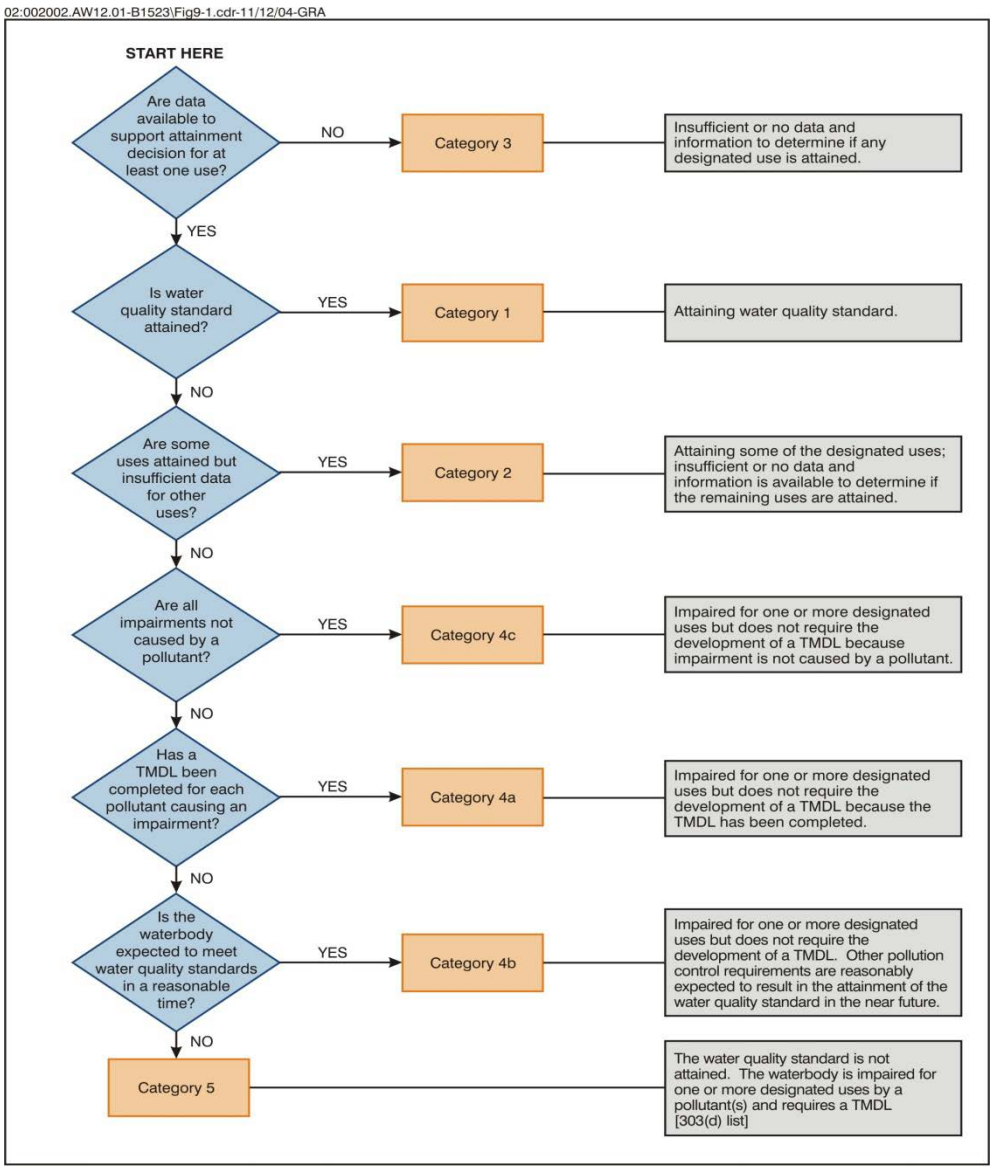


Figure D-1 Logic Flow Diagram for Making Category Determinations

APPENDIX E List of Alaska's Category 5/ Section 303(d) Impaired Waters

NOTE: This appendix is an abbreviated and alphabetical list by Alaska regions of the Category 5/Section 303(d) list of impaired waters. The waters are listed alphabetically by region: Interior (IN), Southcentral (SC), and Southeast (SE).

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
1	IN	40506-007	Chena River	Fairbanks	15 miles	Sediment	Sediment	Urban Runoff
2	IN	40506-002	Chena Slough	Fairbanks	13 miles	Sediment	Sediment	Urban Runoff
3	IN	40402-010	Crooked Creek Bonanza Crooked Deadwood Ketchem Mammoth Mastodon Porcupine	North of Fairbanks	77 miles	Turbidity	Turbidity	Placer Mining
4	IN	40509-001	Goldstream Creek	Fairbanks	70 miles	Turbidity	Turbidity	Placer Mining
5	IN	30501-004	Kuskokwim River (Red Devil)	Red Devil	0.2 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Antimony, Arsenic, Mercury	Mining
6	IN	40506-003	Noyes Slough	Fairbanks	7 miles	Sediment Petroleum Hydrocarbons, Oils & Grease	Sediment	Urban Runoff
7	IN	40510-101	Slate Creek	Denali National Park	2.5 miles	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Antimony, Arsenic	Mining
8	IN	40510-004	Stampede Creek	Denali National Park	2.3 miles	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Antimony	Mining
9	IN	30501-003	Red Devil Creek	Red Devil	0.5 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Antimony, Arsenic, Mercury	Mining

E. Alaska's List of Category 5/Section 303(d) Impaired Waters

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
10	SC	30101-500	Cold Bay	King Cove, Alaska Peninsula	0.01 acre	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Military, Fuel Storage
11	SC	20505-001	Cottonwood Creek	Wasilla	7 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff, Urban Development
13	SC	30203-001	Egegik River	Egegik	0.25 mile	Petroleum Hydrocarbons, Oil & Grease	Petroleum Products	Spills, Fuel Tanks, Under-ground Fuel Tanks
14	SC	20401-412	Hood/Spenard Lake	Anchorage	307 acres	Dissolved Gas	Low Dissolved Oxygen	Urban Runoff, Industrial
15	SC	20402-001	Matanuska River	Palmer	½ mile	Residues	Debris	Landfill
16	SC	30101-502	Popof Strait	East Aleutians Borough	2.4 acres (0.00375 sq. mi.)	Residues	Seafood Waste Residue	Seafood Processor
17	SE	10204-501	Hawk Inlet	NW Admiralty Island	0.962187 acres	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Cadmium, Copper, Lead, Mercury, and Zinc	Mine, Ore Transfer Facility
17	SE	10203-002	Katlian River	N. of Sitka, Baranof Island	4.5 miles	Sediment Turbidity	Sediment, Turbidity	Timber Harvest
18	SE	10203-010	Kimshan Cove	N. of Sitka, Baranof Island	0.028125 sq. miles (18 acres)	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Arsenic, Cooper, Lead, Mercury	Abandoned Mine
19	SE	10103-504	Salt Chuck Bay	Prince of Wales Island	0.03 square miles	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Copper	Mining

E. Alaska's List of Category 5/Section 303(d) Impaired Waters

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
20	SE	10103-010	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3027 (Stream 3)	Prince of Wales Island	0.4 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron	Road Construction
21	SE	10103-012	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3021 (Stream 6)	Prince of Wales Island	1.14 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals – Aluminum, Cadmium, Copper, Iron, Manganese, Sulfate	Road Construction
22	SE	10103-013	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 tributary (Stream 7)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron, Manganese	Road Construction
23	SE	10103-014	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 (Stream 8)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Cadmium, Copper, Iron, Manganese, Nickel, Zinc	Road Construction
24	SE	10103-015	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3017 tributary (Stream 9)	Prince of Wales Island	0.8 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals- Aluminum, Cadmium, Copper, Iron, Manganese, Nickel, Zinc, Sulfate	Road Construction

APPENDIX F Alaska Water Quality Management Programs

Alaska Water Quality Standards

The protection of surface and groundwater occurs primarily through the development, adoption, and implementation of the water quality standards (WQS). The standards specify the degree of degradation that may not be exceeded in a state waterbody as a result of human actions. Alaska WQS were most recently revised on May 26, 2011.

The Alaska WQS (published in Title 18, Chapter 70, of the *Alaska Administrative Code* [AAC]) designate specific uses for which water quality must be protected. Seven uses for fresh waters and seven uses for marine waters are designated. Table F-1 identifies these uses.

Table F-1 Designated Uses of Fresh Water and Marine Waterbodies in Alaska

Designated Use	Fresh Water	Marine
Drinking Water	√	
Agriculture	√	
Aquaculture	√	√
Industrial	√	√
Contact Recreation	√	√
Non-contact Recreation	√	√
Growth and Propagation of Fish, Shellfish, Other Aquatic Life, Wildlife	√	√
Seafood Processing		√
Harvesting Raw Mollusks or Other Aquatic Life		√

By default, waterbodies in Alaska are protected for all designated uses. The few waterbodies for which some uses have been removed are listed in the WQS.

Although Alaska does not have any wetland-specific WQS and neither numeric nor narrative qualitative criteria are specific to wetlands, the Alaska WQS consider wetlands as "waters of the state"; consequently, Alaska's WQS apply to wetlands.

State standards specify the pollutant limits, or criteria, necessary to protect the designated uses for a variety of parameters or pollutants for each of the 14 fresh water and marine uses. Attainment of standards is required for the following 12 pollutants:

- Color
- Fecal Coliform bacteria
- Dissolved oxygen

- Dissolved inorganic substances
- Petroleum hydrocarbons, oils and grease
- pH
- Radioactivity
- Residues (floating solids, foam, debris, deposits)
- Sediment
- Temperature
- Toxic substances
- Turbidity

In the Section 305(b) assessment process for Section 305(b) of the federal CWA, waterbodies are compared to the standards for these parameters to determine whether persistent exceedances of water quality violations occur.

The WQS adopt the state primary drinking water maximum contaminant levels (MCLs) in the Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (18 AAC 70.020(b)(11)). Because the Alaska Drinking Water Program was given primacy by the EPA, the state MCLs have been in full compliance with the National Primary Drinking Water Regulations contaminant limits.

Alaska's WQS also contain provisions for antidegradation, mixing zones, natural conditions, short-term variances, ZODs, and carcinogenic risk levels for chemical contaminants. The antidegradation regulation uses language similar to federal law and requires protection of high quality waters that can include waters of a national or state park, wildlife refuge, or a water of exceptional recreational or ecological significance. In a ZOD, a water quality standard may be exceeded under certain permit conditions.

Every 3 years, DEC conducts a comprehensive review of the WQS in 18 AAC 70. The triennial review is a CWA requirement that helps set pollution limits for Alaska's waters by integrating the most current science and technology. Further information on the triennial review can be found at http://dec.alaska.gov/water/wqsar/trireview/.

Alaska's Clean Water Actions

Alaska's Approach to Water Resources Management

DEC participates in the implementation of the ACWA policy, which was initiated in 1999. Through the ACWA process, DEC, DNR, and ADF&G work together to focus state and federal resources to address issues of water quality, water quantity, and aquatic habitat for the waters with the greatest need. Information about ACWA is available at http://www.state.ak.us/dec/water/acwa/acwa_index.htm.

The cooperating agencies have developed a waterbody nomination and ranking process. The process uses established criteria to identify priorities for assessment, stewardship, and corrective action needs for polluted waters and waters at risk of pollution. These criteria include (1) the statutory criteria, (2) severity of pollution, and (3) expected uses of the waters, according to CWA Section 303(d)(1)(A).

An ACWA database uses four tracks to account for the nominated waterbodies: Data Collection and Monitoring, Adequately Protected Waterbodies, Waterbody Recovery, and Protect and Maintain Waterbodies at Risk.

The ACWA criteria were developed to assign a numeric value that identifies relative priority to each successfully nominated waterbody, resulting in the ACWA Priority Ranking. Waterbodies for which data are not sufficient to suggest a current or anticipated problem are placed in the Data Collection and Monitoring track. The waterbodies for which sufficient and credible data are available and for which those data suggest existence of a current water quality, water quantity, or aquatic habitat problem or the likelihood of future problems are subject to additional analyses. Those further analyses evaluate agency stewardship effectiveness and determine the persistence of standard exceedances or of regulation violations. Many of these waterbodies are entered in the Protect and Maintain Waterbodies at Risk or Waterbody Recovery database tracks.

Ranking the waterbodies enables agencies to focus resources on the most important priorities. Information on individual waterbody rankings are found on the web site cited above.

Description of Ranking Criteria

The ACWA ranking criteria include an identical set of six common factors: allocation (refers to the extent to which the water has been obligated for various uses), condition, protection, future use, present use, and value applied broadly across each of three components:

- Water quantity;
- Water quality; and
- Aquatic habitat.

Each factor is assigned a high (5), medium (3) and lower (1) rating for each component.

Application of the Ranking Criteria

Professional agency staff review readily available information and data related to a given waterbody and assign a factor rating using their best professional judgment for each factor. The agency most knowledgeable and familiar with the data is responsible for an individual component. For instance, DNR hydrologists are assigned the responsibility for providing factor-ratings for water quantity, ADF&G biologists are assigned the responsibility for providing aquatic habitat factor ratings, and DEC is assigned the responsibility for making water quality ratings. Waterbodies are ranked in descending order of their assigned ranking score. Numeric thresholds are established, and each waterbody is assigned a high, medium, or lower priority. More detailed information on the ranking process is available online at http://www.dec.state.ak.us/water/acwa/acwa_ranking.htm

Funding Priorities

Funding to support high-priority protection and restoration efforts identified by the ACWA process may come from state agencies such as DEC, DNR, or ADF&G. Each funding source has a unique set of obligations and conditions for use.

A single, integrated solicitation process that captures the requirements associated with each potential funding source was developed in 2003. The consolidated solicitation process reduces the burden on applicants by providing a "one-stop shopping" approach to their funding searches. It facilitates the project evaluation and award process of the agencies by providing, in one process, the ability to optimally match projects with the best funding source and provide all information required to make the funding awards. Project evaluations and matches to funding sources are accomplished by an interagency team representing all resource management and funding source agencies.

ACWA Priority Actions

ACWA priority water actions (the needed actions on the ACWA-priority waters) are identified for approximately 20 to 30 Alaska's waters on an annual basis. Grant funds are made available for these waters. Eight projects were funded for actions from July 2010 to June 2011. This represents a significant decrease in the number of projects due to a decrease in available funding. Specific information on actions request and grants funded is available at http://dec.alaska.gov/water/acwa/acwa_index.htm.

Alaska Water Monitoring and Assessment Strategy

DEC developed a long-term Water Quality Monitoring and Assessment Strategy (Strategy) to guide its stewardship of Alaska's marine and fresh waters. The complete document presenting the Strategy, which was completed in June 2005, is available for review at http://www.dec.state.ak.us/water/wqsar/monitoring/DEC_monitoring_strategy_final_2005.pdf.

The Strategy is intended to meet the federal expectations for state water quality stewardship activities enumerated in the CWA in a manner influenced by the unique needs and challenges of Alaska. The Strategy integrates policy and program elements embodied in the ACWA policy and in the EPA *Consolidated Assessment and Listing Methodology* and *Elements of a State Water Monitoring Program*

documents. The major policies of the ACWA and EPA define specific objectives for the Strategy from state and federal perspectives.

The purposes of the Strategy document are to (1) serve as a framework for Alaska resource agency decisions required for assessing and monitoring Alaska's water resources; (2) support protection and restoration decisions; and (3) serve as a roadmap for improving state, federal, local, tribal, and public capabilities and performance over time for monitoring the status and trends of Alaska's water resources.

The Strategy focuses on what can be done with available financial resources, considering the abundance of Alaska's water resources. Because of this abundance, Alaska must establish priorities for applying limited state resources for monitoring and assessing state water resources. The Strategy touches on waterbody level monitoring through ACWA and ambient analysis through the Alaska Environmental Monitoring and Assessment Program.

The Strategy is organized around ten elements that must be addressed to ensure that monitoring and assessment activities are conducted on a rational basis and in a manner that ensures information is of good quality and is accessible for resource management decisions. Those elements are as follows:

- Monitoring Program Strategy
- Monitoring Objectives
- Monitoring Design
- Core and Supplemental Water Quality Indicators
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure Analysis

The Strategy enables DEC to revise monitoring programs based on emerging needs. For example, the monitoring programs can be adapted to evaluate the impact of global changes on Alaska waters. DEC recognizes that sources external to Alaska may affect water quality. Information or direction from the Alaska Climate Change Task Force (http://www.climatechange.alaska.gov/) can be incorporated into future waterbody assessments and listing methodologies. The Task Force has direct responsibility for a host of climate change impacts, including the assessment of warming estuaries and fresh water habitat that support fisheries. The Task Force also intends to seek funding for an ocean acidification research and monitoring plan.

In 2006, EPA Region 10 completed a review of and accepted the DEC Strategy.

Alaska's Aquatic Resource Surveys – Probabilistic Assessments

Probability-based assessments are part of the DEC Water Quality Monitoring and Assessment Strategy. Ten regional probabilistic assessments of fresh water and marine aquatic resources (Figure F-1) have been conducted since 2002. The discussion below addresses the 2008 Cook Inlet Lakes, 2004 Southeast

Alaska, and Advanced Monitoring Initiative for which final reports have recently been completed. The full reports are available at http://www.dec.state.ak.us/water/wqsar/monitoring/emap_Map.htm and in the EPA *National Coastal Condition Report IV* (2012). Field surveys have been completed on the coastal Aleutian Islands (2006 and 2007), Yukon River (2009), Kachemak Bay (2009), near-shore Chukchi Sea (2012), and Arctic Coastal Plain Wetlands Survey (2010). Draft reports for the 2009 Yukon River and 2006-2007 Aleutian Island survey are available. The 2009 Kachemak Bay survey is being combined with similar work performed by the National Ocean and Atmospheric Administration (NOAA) in that region and NOAA will produce a final report. Chukchi Sea samples are undergoing analyses and identification, a final report is expected in the spring of 2014. Biological samples from the Arctic Coastal Plain Wetlands survey are undergoing analyses and a final report will be available December 2013.

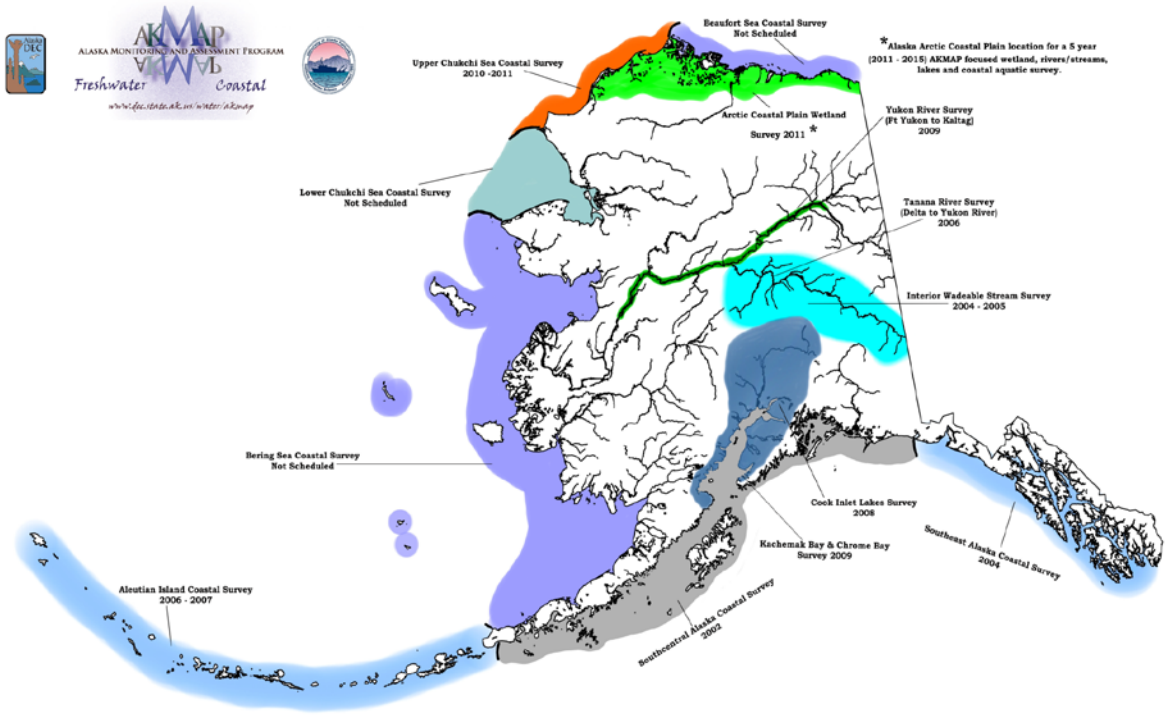


Figure F-1 Location Map

Because of the low population density and limited industrial and agricultural activities that characterize the state, Alaska's aquatic resources are often assumed to be in pristine or near-pristine condition. However, long-range atmospheric and oceanic transport from the more populated and industrialized centers are delivering contaminants to Alaska. The assessments reported on in this appendix utilized "core national indicators" as part of the EPA National Aquatic Resource Survey program. Currently, the core indicators and sampling design used in Alaska are not designed to assess condition of aquatic resources related to accumulation of contaminants at the trophic level of the food web nor climate change impacts, such as ocean acidification.

2004 Southeast Alaska

In 2004, as part of EPA's Western States Coastal Environmental Monitoring and Assessment Program, DEC surveyed Alaska's Southeast province. Southeast Alaska is a relatively unpopulated area of the state. However, Southeast waterways are used extensively by the cruise ship industry and it is estimated that a population equivalent to the entire state of Alaska traverses these waters each summer. The survey location was selected based on concerns for potential environmental impacts associated with black- and gray-water discharges from the cruise ship industry, along with additional water and sediment quality concerns associated with Southeast Alaska's fishing and mining industry.

The overall condition of Southeast Alaska's coastal waters is rated good. The water quality, sediment quality, and fish tissue contaminants are rated good. The benthic index for this region could not be evaluated. This assessment is based on environmental stressor and response data collected from 42 locations (three samples for water quality and sediments were lost, resulting in only 39 sample sets used in ranking water quality and sediments) along Southeast Alaska's coastline.

The report for the 2004 Southeast Alaska survey can be found at http://www.dec.alaska.gov/water/wqsar/monitoring/2004Southeast.htm. This report contains the summary ratings, rationales, methods, and survey design.

2008 Cook Inlet Lakes Survey

In 2008, DEC collected data at a total of 50 sites that covered the Cook Inlet basin as part of EPA's National Lake Assessment. This basin, located in Southcentral Alaska, is 39,325 mi^2, slightly smaller than Kentucky. Although it supports more than half of Alaska's population, large portions of the region's natural environment remain intact. The Cook Inlet basin spans the western Kenai Peninsula, Matanuska and Susitna valleys, and the west side of Cook Inlet as far south as Katmai National Park, lakes in this region represent a large range in morphometry, size, climate, and elevation.

An extensive array of chemical, physical, and habitat measurements were collected in addition to sampling zooplankton, littoral macroinvertebrates, and sediment core diatoms. Taken together, the data provide a thorough characterization of the current ecological conditions while the sediment core diatoms enable researchers to infer how conditions have changed over time. The 50 lakes surveyed represent 31% of the total lake numbers in the Cook Inlet Basin or 2,571 lakes, and 82% or 4,555 ha of the total lake surface area in the basin. The lakes sampled in this basin are considered healthy due to the lack of anthropogenic influences on the majority of lakes, minimal impacts from urbanization and results are considered to be within expected ranges for natural conditions.

The report for the 2008 Cook Inlet Lakes survey can be found at http://www.dec.alaska.gov/water/wqsar/monitoring/2008CookInletLakes.htm. Summaries are presented of in-situ and laboratory water chemistry, sediment metal, fish tissue, GIS, sediment diatom, zooplankton, and benthic macroinvertebrate analyses. At the time of publication sediment mercury and *Enterococci* data have not been provided by EPA. Physical habitat analysis, recently provided by EPA has not been evaluated.

2011 Advanced Monitoring Initiative

Considerable costs have been incurred in environmental studies of Alaska waters, in this case the Beaufort Sea, to assess background conditions to assist in monitoring impacts from oil and gas resource development. The principal datasets used in the study are from the U.S. Department of Interior Mineral Management Environmental Studies Program that supports the offshore oil and gas-leasing program of the U.S. Department of the Interior (USDOI) in pursuit of national energy policies. These studies are typically targeted studies designed to provide MMS with information to monitor and assess potential impacts of oil and gas development. While these studies are designed to meeting MMS project needs, sampling methodologies and resultant datasets are applicable to addressing regional scale issues or questions raised by non-governmental groups and federal/state agencies. Some of these questions are:

- *How is the regional environment changing?*
- *Are the problems faced getting better or worse?*
- *Where are problems located?*
- *Are government or private programs dealing effectively with these problems?*
- *Can results be extrapolated to the regional resource population to estimate current status, trends, and changes in select indicators with known confidence?*
- *Are there associations between select indicators of natural and human stresses and indicators of the condition of ecological resource?*

As discussed in the report, probabilistic survey sampling can provide reliable, unbiased estimates of regional ecological condition. The GRTS design (Generalized Random Tessellation Stratified) used for the probabilistic sampling in the present study is one of a number of probabilistic designs and provides spatially-balanced samples and unbiased estimates for sampling large regions. The use of targeted (fixed) vs. probabilistic (random) designs depends on the goals of each project with fixed stations providing greater power but spatially-limited inferences. Long-term sampling of fixed locations provides the means to detect long-term environmental change and should be a focus of local sampling but the range of inferences are limited to the chosen locations whereas random sites. Difficulties arise when compiling data from various sampling designs to gain insights into regional trends. Comparisons of targeted and probabilistic survey sampling documented that regional extrapolation of non-probabilistic results cannot provide unbiased estimates of regional condition. Our attempt to use the historic datasets for this region to provide a methodology for a reasonable *post hoc* survey analysis, while having some success, clearly indicated the need for a long-term reasoned multi-faceted monitoring effort.

The report for the 2011 Advance Monitoring Initiative can be found at http://www.dec.alaska.gov/water/wqsar/monitoring/AMI.htm Summaries are presented of data recovery methods, retrospective analysis using EMAP methods, and a discussion of historic data recovery results.

F-2 AKMAP Project Status

PROJECT STATUS	STATUS
COASTAL	

2002 South Central	COMPLETED
2004 Southeast	COMPLETED
2006-2007 Aleutian Islands	IN PROGRESS
2009 Kachemak Bay	IN PROGRESS
2010-2012 Chukchi Sea	DRAFT REPORT
FRESHWATER	
2004-2005 Tanana Watershed Wadeable Streams	COMPLETED
2006 Tanana River Basin	COMPLETED
2008 Cook Inlet Lakes	COMPLETED
2009 Yukon River	DRAFT REPORT
WETLAND	
2011 Arctic Coastal Plain	IN PROGRESS
OTHER STUDIES	
Advance Monitoring Initiative	COMPLETED

Nonpoint Source Pollution Program

Because much of Alaska is undeveloped and relatively pristine, the primary emphasis of the nonpoint source pollution strategy is prevention. In populated areas, however, many waterbodies, including important salmon streams, have been degraded and need restoration. Waterbody restoration plans are developed and implemented for waterbody locations where water quality is impaired. Restoration strategies for polluted waterbodies consider the entire watershed and include measures to control the sources of pollution to prevent future degradation. Restoration activities are designed to achieve a water quality condition appropriate to the specific site.

Nine key elements have been identified by EPA as necessary for an effective nonpoint source program in Alaska:

- Explicit short- and long-term goals, objectives, and strategies to protect surface and groundwater;
- Strong working partnerships and links to appropriate state, tribal, regional, and local entities (including conservation districts), private-sector groups, citizens' groups, and federal agencies;
- A balanced approach that emphasizes both statewide nonpoint source programs and on-the-ground management of watersheds where waters are impaired and threatened;

- Abatement of known water quality impairments resulting from nonpoint source pollution and prevention of significant threats to water quality from present and future activities;
- Identification of waters and watersheds impaired by nonpoint source pollution and important unimpaired waters that are threatened or otherwise at risk. Alaska's Nonpoint Source Water Pollution Program includes a process of progressively addressing these waters by conducting more detailed watershed assessments, developing watershed/waterbody implementation plans, and implementing those plans;
- Review, upgrades, and implementation of all program components and establishment of flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water, including (1) a mix of programs based on water quality, technology, or both; (2) a mix of regulatory, nonregulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses of water; and (3) incorporation of or cross references to existing baseline requirements established by other relevant federal or state laws;
- Identification of federal lands management and activities that are not managed consistently with the objectives of Alaska's nonpoint source program;
- Efficient and effective program management, including necessary financial management; and
- Periodic review and evaluation using environmental and functional measures of success in which sources of nonpoint source pollution are assessed and the management program is revised at least every 5 years.

These nine key elements have been incorporated and integrated with ACWA policy in the Alaska Nonpoint Source Water Pollution Control Strategy. This strategy is available at http://www.dec.state.ak.us/water/wnpspc/pdfs/2007_NPSStrategy.pdf. The following general sources of nonpoint source pollution are addressed:

- Urban and community development
- Forest practices
- Harbors and marinas
- Hydromodification
- Mining
- Agriculture
- Road, highways, and bridges.

Maintenance of good water quality can only be achieved when all sources of pollution are considered, resources are used for the highest priorities, and people work together to prevent pollution and achieve clean water goals. Integration of the nine key program elements listed above with the ACWA priorities ensures that stewardship and prevention, monitoring and, when necessary, restoration actions are implemented.

Alaska Coastal Management Program

F. Alaska Water Quality Management Programs

The Alaska Coastal Management Program (ACMP) authority expired on July 1, 2011 per AS 44.66.030. Until and unless additional authorization is approved by the state legislature, Alaska no longer has a specific Coastal Management Program. However, most of the previous waterbody protections for coastal resources continue to be in effect under the authority of their implementing state programs including:

- State certification of federal permits and activities that WQS will be met
- Fish habitat protection
- Water rights appropriations
- *Alaska Coastal and Harbor Design Procedures Manual*
- Harbor management agreements
- Forest Resources and Practices Act
- Regulations and erosion and sediment control plans for dam construction.

BEACH Grant Program

The goal of the Alaska BEACH Grant Program is to provide funding that helps Alaskan communities monitor the state's marine beaches for fecal pollution.

DEC surveyed Alaska coastal communities and found that some beaches more likely to have a higher level of bacterial contamination than others. To learn more about the extent of possible sources of the presence of FC bacteria or enterococci bacteria, DEC has entered into an agreement or memorandum of understanding (MOU) with several coastal communities that will be able to apply for BEACH Grant funding. These cooperating communities will work with DEC for water quality monitoring, community notification, and training.

Data collected from the BEACH monitoring program is available at the following web site http://watersgeo.epa.gov/beacon2/

The BEACH Act of 2000

The Beaches Environmental Assessment and Coastal Health (BEACH) Act was signed into law in October 2000 in response to concerns that people were becoming ill after visiting local shores/beaches, especially when they came into direct contact with the water during recreational activities. EPA awards grants to state and tribal authorities to assist with the implementation of beach water monitoring and advisory notification programs. More information on the EPA beach program can be found at http://water.epa.gov/type/oceb/beaches/.

Alaska Beach Monitoring Program

With the assistance of interested organizations and the general public, DEC has developed a beach monitoring program to evaluate the possible risk to recreational beach users in Alaska. By notifying the public in the event that a sample exceeds the allowable levels, this program will help prevent illnesses that could result from exposure to contaminated beach water.

Identification of Alaska Beaches

The DEC BEACH Grant Program defines a beach as "any shoreline where recreational activities may bring a person into complete or partial body contact with marine water." According to this definition, a beach may include sections of a shoreline that do not appear to look like a sandy beach.

A Recreational Beach Survey was performed in 2003 to gather information from coastal communities about the recreational use of beaches in their areas. The 60 responses received identified 203 recreational-use beaches as areas that were used for recreational purposes. These beaches were located in 53 coastal Alaska communities.

Current Status of the Alaska BEACH Program

DEC funds monitoring and development of phases of the BEACH program by local communities and tribal governments through the ACWA/BEACH grant process. Communities (including Dillingham, Haines, Juneau, Naknek, and Homer) have monitored local recreational beaches for indicator bacteria using funding from the Alaska BEACH Grant Program since summer 2007. The program supports monitoring of marine water quality adjacent to high-use beaches. Grantees sample beach water for organisms (FCs and enterococci bacteria) that indicate the presence of fecal contamination.

Funding for beach monitoring will be made available through the ACWA/BEACH grant process to communities with high-priority beaches. More information about the Alaska BEACH grant program is available at http://www.dec.state.ak.us/water/wqsar/wqs/beachprogram.htm.

Point Source Pollution Program

Overall Approach

DEC's point source pollution program covers more than 1,000 permitted facilities and activities throughout the State of Alaska. DEC's overall approach to water quality management is to focus staff resources on facilities and activities that pose higher risks to public health or the environment. Efforts are under way in six broad categories, including delegation of the wastewater permitting program.

Delegation of the Wastewater Permitting Program

In October 2008, EPA formally approved the State's application to administer the NPDES wastewater permitting and compliance and enforcement program for point source discharges of pollution to waters of the United States. The State's program is called the Alaska Pollutant Discharge Elimination System (APDES) Program.

Authority to administer the federal program is transferring to DEC in four phases, which began at program approval in 2008. Phases I through III were completed in October 2010. In August 2011 EPA approved DEC's request to delay transfer of Phase IV (primarily the oil and gas sector) until October 2012. The history of the transfer of authority to DEC, as well as information about the APDES Program, is available for review at the following DEC web page:

State of Alaska - Department of Water - Alaska Pollutant Discharge Elimination System

DEC will continue to issue state individual and GPs for discharges that do not require an NPDES permit. DEC also will continue to review permits for facilities still under EPA authority for water quality impacts.

Focus on High-Priority Permits

Staff focus on improving and updating permits for facilities and activities that pose a higher risk to human health or the environment by working on APDES and federal NPDES permits for all large-volume dischargers, new discharges, and by using new or reissued GPs that standardize the review of similar or lower-risk projects. DEC also regulates domestic wastewater treatment facilities that have not been permitted by the EPA but need a discharge permit and are important to the human health in smaller Alaskan communities. Finally, DEC prioritizes facilities to be inspected through the use of a risk-based scoring and ranking model as well as by applying national EPA priorities.

Enhancement of Compliance

A facility's compliance with effluent limits and operational conditions designed to protect water quality is enhanced by assistance from DEC staff, which have extensive experience with a wide variety of local conditions and waste treatment technologies. Routine review of monitoring records submitted to DEC and follow-up with facility operators as needed also yield incremental improvements in the ambient water quality.

Provision of Technical Information

Trained and technically competent staff are accessible through various telecommunication tools that bridge the vast distances that characterize Alaska. Staff support permittees and their consultants by providing technical assistance and resources for information about successful technologies and practices for wastewater treatment and discharge.

Streamlining of the Permitting Process

Regulatory compliance is facilitated by streamlined application, fee payment, and electronic reporting; permit conditions that focus on cost-effective practices gleaned from statewide experience; and consistent application of requirements across industry sectors on pollutants of concern. Also, a modern data system provides an analytical tool to support improvements in other aspects of DEC's water quality program, e.g., tracking and reporting on improvements to Alaska's waters.

Protection of Subsurface Wastewater

DEC wastewater engineers review plans for onsite wastewater systems (septic systems), wastewater lagoons, and underground injection control (UIC) wells (specifically, EPA Class V injection wells). Underground disposal systems and injection wells can pose a threat to groundwater quality and drinking water sources. Common examples of underground disposal systems in Alaska are sumps, drains, drywells, and drainfields used to dispose of septic tank effluent, as well as wells for commercial wastewater injection. Class V wells are also used for the disposal of stormwater and snow melt. Contaminants associated with discharges to injection wells can include nutrients, bacteria, viruses, solvents, antifreeze, used oil, and dissolved heavy metals. These pollutants can degrade groundwater aquifers used for public and private drinking water sources. DEC's reviews ensure that nondomestic and domestic wastewater (septage and sewage) is properly treated, stored, handled, and disposed of in a safe and sanitary manner. DEC engineers also review and approve plans for the design and construction of domestic and commercial wastewater treatment, storage, and disposal facilities. Staff also review monitoring reports for treated wastewater discharges to the surface of the land or into the ground that may affect the groundwater. Information from the domestic wastewater program is used to create maps that show the location of septic systems, identified UIC wells, wastewater treatment systems, and sewage lagoons. This information is essential when completing public water system source water assessments for the drinking water protection program (see Drinking Water section below).

Regulation of Stormwater

Stormwater discharges are generated by runoff from land and impervious areas, such as paved streets, parking lots, and building rooftops during rainfall and snow. This runoff often contains pollutants in quantities that could adversely affect water quality.

Authority to administer the NPDES Stormwater Program transferred to DEC on October 31, 2009. The point source stormwater program focuses on two types of stormwater: industrial and municipal.

Stormwater discharges that require an APDES permit include discharges from constructions sites disturbing 1 or more acre of land, certain industrial facilities, and municipal separate stormwater sewer systems (MS4) in the Anchorage and Fairbanks areas. APDES stormwater permits require the use of Best Management Practices to ensure proper site control of rainfall and snowmelt so that runoff is treated, and contact with pollutants is prevented with good site design and construction.

Under 18 AAC 72.600, DEC reviews and approves engineering plans for stormwater treatment and discharge systems. The goal of this review is to ensure that permanent stormwater systems are designed and constructed to meet pollutant removal criteria and BMPs.

Environmental Compliance Program for Commercial Passenger Vessels

In 2001, Alaska passed an innovative pollution prevention law that applied to passenger vessels, including some Alaska Marine Highway System vessels. The law applied to both small commercial passenger vessels, serving 5 to 249 people, and large commercial passenger vessels, serving 250 or more people. The Commercial Passenger Vessel Environmental Compliance Program (Cruise Ship Program)

implements the law and ensures that cruise ships and ferries comply with wastewater effluent and visible emission standards. Effluent limits are set for both graywater (e.g., water from showers and dishwaters) and blackwater (e.g., toilet water).

There have been two changes to the original law. In 2004, the Legislature revised the law that applied to small passenger vessels. It allowed small commercial passenger vessels to implement alternative compliance methods, known as Best Management Practices (BMP) to manage their wastewater discharge; for example, discharging only while underway. In August 2006, the voters approved a citizen-sponsored cruise ship ballot initiative. The new law requires that cruise ships obtain wastewater permits in order to discharge. It also requires that observers—Ocean Rangers—be placed on board large commercial passenger vessels while in Alaska waters. The Cruise Ship Program issued a wastewater discharge General Permit (GP). DEC is also in the process of selecting a contractor to place Ocean Rangers on board ships during the 2012 cruise season.

The Cruise Ship Program also conducts scientific research to assess the impact of cruise ship wastewater on the environment in Alaska and may create additional standards if science and technology warrant. The state law also addresses the offloading or disposal of nonhazardous solid wastes (besides sewage) and hazardous wastes in Alaska. Vessel owner/operators are required to annually submit a description of the vessel procedures for handling nonhazardous and hazardous waste and to report any deviations from the vessel plan to DEC. The Cruise Ship Program is supported by industry fees.

Drinking Water Program

The Drinking Water Program consists of four interrelated sections charged with oversight of public water systems (PWSs). The sections and additional areas of responsibility are identified below:

- Engineering;
- Compliance and Monitoring—PWS compliance and enforcement activities;
- Statewide Technical Services—Drinking water protection, Alaska PWS Database, PWS security and emergency response planning, and statewide PWS compliance and enforcement coordination; and
- Program Management and Administration.

Public Water System and Drinking Water Compliance

Staff in the Compliance and Monitoring, Engineering, and Statewide Technical Services sections primarily compose the Drinking Water Program's compliance and enforcement group for the Drinking Water Program. These compliance and enforcement activities are referred to as the Public Water System Supervision (PWSS) Program. The Alaska PWSS Program focuses on PWSs that are federally regulated, which are systems that provide drinking water to 25 or more individuals and do not include single-family homes or duplexes with their own private wells. Alaska has approximately 1,540 federally regulated PWSs, using November 1, 2011 inventory data from our Safe Drinking Water Information System (SDWIS) database. This inventory figure is dynamic, changing frequently in the course of a year. Some PWSs are seasonal, shutting down for 6 to 9 months of the year. In addition, many systems

are slowly going out of business, disbanding, or being consolidated into larger systems, and many small community-type systems are starting up in the areas of rapid growth, such as the Matanuska-Susitna Valley.

Both the State of Alaska and the federal government classify PWSs based on population served and duration of operation, regardless of whether the drinking water source is groundwater or surface water. The federal (EPA) classifications for PWSs are Community Water Systems (CWS), Non-transient Non-community Water System (NTNCWS), and Transient Non-community Water Systems (TNCWS). The State of Alaska adopted the federal nomenclature for PWS classification effective April 2009. Alaska's November 2011 **PWS** inventory showed 432 CWS, 258 NTNCWS, and 850 TNCWS.

Alaska is a primacy state for drinking water and has direct oversight of PWSs within the state. The state is required to complete the timely development or adoption of federal drinking water rules and obtain and maintain primacy for all drinking water rules and required drinking water initiatives. As a primacy state, Alaska is required to implement the state PWSS Program to meet the intent and requirements of the Safe Drinking Water Act (SDWA) and its 1986 and 1996 amendments.

The Alaska PWSS Program does not create, measure, or develop data. Rather, it provides for collection of information routinely sent directly to the Drinking Water Program staff. The information collected and the responsible parties involved are identified below:

- PWS compliance monitoring data, prepared and reported electronically to the state using the Electronic Data Reporting System (EDRS) by DEC-certified laboratories;
- Operator reports, provided by PWS owners or operators; and
- Sanitary survey inspector reports, prepared by DEC Drinking Water Program staff and DEC-certified third party Sanitary Survey Inspectors.

Drinking Water Program engineering staff also complete component assessments of onsite water system status and comprehensive performance evaluations of Alaska PWSs to confirm that systems were built as approved and to provide information to PWS owners to better optimize system performance. Staff review and either approve or disapprove the engineered plans for PWS treatment, storage, and distribution systems. The program requires that PWSs produce treated water that meets the standards set by federal rules and state regulations for the regulated drinking water contaminants. The program receives, stores, and uses monitoring data on PWS compliance for the regulated drinking water contaminants as well as any specific rule requirements to confirm that the health of the customers being served by a PWS is protected. The program requires that PWSs be in compliance with SDWA requirements, federal rules, and state regulations at all times. If a PWS is in noncompliance, Drinking Water Program staff provide technical and compliance assistance. Drinking Water Program staff also take appropriate enforcement actions, as outlined in our EPA-approved Compliance and Enforcement Strategy or may refer the PWS to EPA for enforcement.

All PWS location data for Alaska's federally regulated PWSs was provided to the EPA approximately seven years ago (2004). Alaska PWS location data for new systems and existing treatment systems, wellhead (groundwater source), and intake (surface water source) are routinely checked during the sanitary survey process. Any changes in location data are corrected in the state-maintained PWS

database, which is named SDWIS/State. All routine data for federally regulated PWSs are reported to EPA during monthly or quarterly data transfers. This information includes the State of Alaska PWS inventory, source types, populations served, latitude and longitude of new treatment systems and source intakes or updated information from existing systems, compliance monitoring data, enforcement actions, and operator reports.

Alaska is also required to submit to EPA an annual public water system compliance report for its PWSS Program. First submitted in 1996, the annual compliance report must be submitted to EPA by July 1 of each year for the previous calendar year, unless designated otherwise by EPA.

Drinking Water Protection

The Drinking Water Protection (DWP) component of the statewide Drinking Water Program ultimately focuses on the assessment of water supplies used by Alaska public water systems (PWSs) for drinking water purposes and the protection of groundwater supplies used by PWSs. Through an extensive public involvement process, Alaska developed its Drinking Water Protection Program, a combined source water assessments and Wellhead Protection Program for PWS, which was approved by EPA on April 4, 2000. This component of the statewide Drinking Water Program combines activities and information from PWS source water assessments and Wellhead Protection Management Plans (WPMPs), and focuses on the protection of drinking water produced and distributed by PWSs that use surface water, groundwater, or combined sources.

The initial project to complete source water assessments for Alaska PWSs was completed by July 1, 2004 (the EPA deadline for completion of PWS source water assessments for existing systems by primacy states). A total of 1,668 source water assessments were completed for 1,427 PWSs. Currently, source water assessments for new PWSs are being completed after the system is built and inventory information is documented in SDWIS/State. Since July 1, 2004 and as of October 2009, 275 new PWS source water assessments have been completed. The following activities associated with the source water assessment process also have been completed since July 1, 2004: 527 PWS delineations, 310 contaminant source inventories, and 308 vulnerability analyses. The source water assessment process includes identifying source water (drinking water) protection areas using a series of uniform flow equations and watershed delineations; completing a contaminant source inventory of all potential and existing sources of regulated drinking water contaminants within the protection areas; and completing a vulnerability assessment based on the level of risk associated with identified potential and existing contaminant sources. The goal of completing PWS source water assessments is to identify and prioritize contaminant risks to public water supplies as a basis for protection efforts. These protection efforts will be largely undertaken at a local level and will be supported by the state through possible regulations, guidance documents, fact sheets, interactive CD-ROM and Wellhead Protection Program activities. In addition, the source water assessments are a crucial tool for use by the state in assisting operators and owners of PWSs in achieving compliance with the EPA Groundwater Rule, promulgated November 8, 2006.

During fiscal year 2004, an interactive CD-ROM was developed and produced for PWS owners, managers, operators, and communities to use to develop their WPMPs. The CD directs the users through the information entry process with easy-to-use methodology and easy-to-understand

instructions. The end product is a written wellhead protection plan specifically designed for a particular public drinking water system or local community. The completed source water assessment report and the most recent sanitary survey are then added as appendices to the plan, resulting in a complete and comprehensive WPMP for the system. Although the CD-ROM continues to be used by PWSs, it was originally designed for PWSs utilizing groundwater for their drinking water supplies (e.g., Wellhead Protection Activities). To facilitate the integration of surface water and groundwater protection efforts, revisions to the CD-ROM will be explored in the future.

The Wellhead Protection Advisory Committee (WPAC) recommended to the State of Alaska, DEC Drinking Water Program, that the statewide voluntary Public Water System Wellhead Protection Program be renamed the "Drinking Water Protection Program" to facilitate the integration of surface water and groundwater protection efforts. In addition, the advisory committee recommended and approved the creation of "Endorsed Drinking Water Protection Plans" and redefined the definition of "substantial implementation," a term used by EPA to measure protection strategies that minimize the risk of contamination of a source of drinking water. A list of these recommendations can be reviewed on the Drinking Water Program website at http://www.dec.state.ak.us/eh/dw/DWP/WAC.htm.

As of October 2010, 62 PWSs had substantially implemented a Drinking Water Protection Plan. These 62 PWS provide drinking water to 342,973 consumers. More than 50% of the residents and visitors of the State of Alaska receiving water from a PWS receive water from systems with a substantially protected source of drinking water.

Criteria for the Endorsed Drinking Water Protection Plans were established in conjunction with Alaska Rural Water Association (ARWA) criteria for the development of protection plans for which ARWA staff assists communities with development. As of October 2010, 12 water systems had Endorsed Drinking Water Protection Plans. It is hoped that new fiscal incentives from the Alaska Clean Water Actions (ACWA) grant program will help facilitate the development of Endorsed Drinking Water Protection Plans. DWP staff continues to work toward identifying the communities that are currently implementing protection strategies. The communities that are implementing protection strategies will be recognized and may qualify for future incentives. In the meantime, DWP staff continue to focus their efforts on communities that do have protection strategies in place.

In fiscal year 2010, the Drinking Water Protection Group collaborated with the ACWA grant program, which is a multi-agency effort coordinated by the DEC Division of Water. The DEC Drinking Water Program, Drinking Water Protection group, contributed $17,000 from the Drinking Water State Revolving Fund (DWSRF), Local Assistance and Other State Programs set-aside. These funds are to be used toward proposals that promote or develop stewardship strategies leading to increased protection of water sources used for public drinking water supplies. Of the $17,000 allocated, a total of $7,858 was awarded to the Gulkana Village Tribal Council to decommission 5 abandoned wells near their active public water source. The remaining funds allocated for two other grant projects went unused and were returned to the (DWSRF), Local Assistance and Other State Programs set-aside for other Drinking Water Program activities.

Vulnerability assessments of public water supplies, which are part of the source water assessment process, can serve as a foundation for comprehensive management and protection of Alaska's

groundwater resources. In addition, they can assist a PWS owner using a groundwater source achieve and maintain compliance with the Ground Water Rule and can support future commercial and industrial growth. Information gathered and generated during the initial years of the source water assessment program for public water supplies can be used to enhance the protection of lakes, rivers, and streams in populated areas by validating or improving on the (Total Maximum Daily Load) TMDL values used to issue permits to discharge wastes. This information can also be used to establish TMDLs to manage the discharge of wastes to aquifers; identify critical sole-source aquifers used as a drinking water supply by a PWS; identify any areas of declining groundwater levels or degrading groundwater quality; and perform unified watershed assessments statewide.

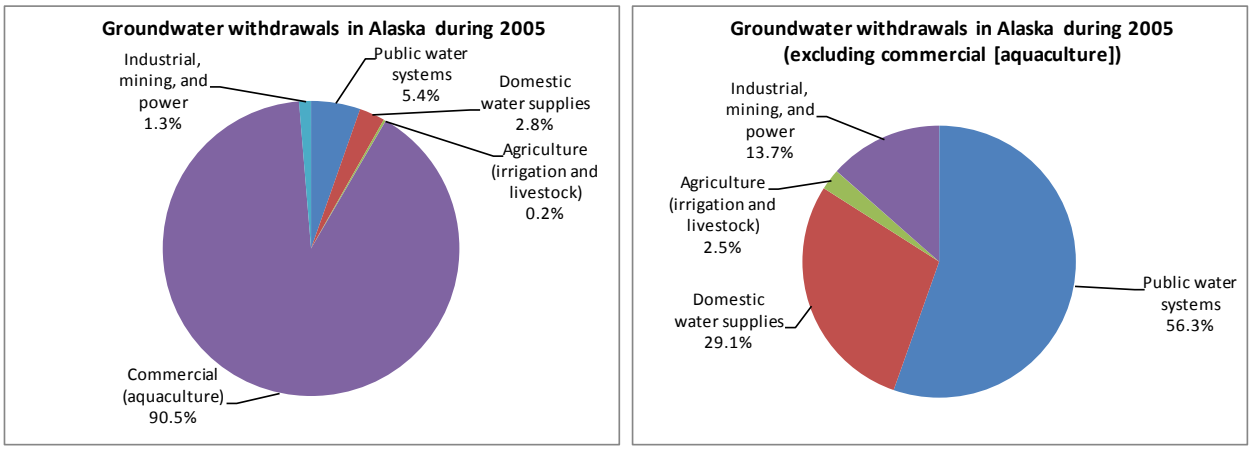
If a PWS provides drinking water that meets all the health-based standards set by the SDWA on a consistent and adequate basis, good public health protection is established for the customers served by that PWS. All activities completed in the Drinking Water Program support the overall goal of requiring that PWSs provide both a safe and adequate supply of drinking water for the residents and visitors to the State of Alaska.

More information on source water assessments, completed assessment reports of PWS sources, and wellhead protection activities, is available on the DEC Drinking Water Program, Source Water Assessment, and Wellhead Protection web pages at http://www.dec.state.ak.us/eh/dw/dwp/source_water.html.

Groundwater Protection

Groundwater Importance: Alaska's groundwater resources may be among the most abundant in the nation. However, very few aquifers in Alaska have been studied (or even located), and limited water quality data are available.

Alaska is sparsely populated with approximately 710,231 residents and about 1.2 persons per square mile (U.S. Census Bureau, 2010). Urban development is concentrated in a few main population centers, with the majority of people living in Southcentral Alaska. Nearly one-half of the state's population lives within the Municipality of Anchorage, in Southcentral Alaska. Other major population centers include Fairbanks, in Interior Alaska, and Juneau, the state capital, in Southeast Alaska. Beyond these major population centers, communities tend to be small and generally not connected by roads.



Source: Estimated Use of Water in the United States in 2005 (U.S. Geological Survey Circular 1344, 2009)

Figure F-2 Groundwater Uses in Alaska

Groundwater Uses: Groundwater contributes to about 55% (482 million gallons per day [mgd]) of the overall state fresh water use. As of November 2011, eighty-two (82%) percent of Alaska's 1,535 public water systems (PWSs) utilize groundwater. The total groundwater withdrawn for these PWSs represents about 34% (25.9 mgd) of the total fresh water used by all Alaska PWSs (75.8 mgd). This relatively small amount of groundwater use is due to a small number of PWSs serving a large number of people from surface water sources. Examples of the systems serving many people are those in Anchorage, Cordova, Ketchikan, Kodiak, and Sitka. An estimated 95% (13.4 mgd) of the total fresh water used for domestic water supplies (14.1 mgd) is groundwater. Of the estimated 482 million gallons of groundwater used in Alaska each day, more than 5% (26 mgd) is used by PWSs. Excluding commercial (i.e., aquaculture) groundwater use (436 mgd), PWSs use 56.3% (25.9 mgd) of the remaining groundwater withdrawals, domestic water supplies account for 29.1% (13.4 mgd), industrial, mining, and power production uses 13.7% (6.29 mgd), and agriculture uses 2.5% (1.16 mgd).[1] Figure F-2 shows the distribution of groundwater uses.

Groundwater Availability: Groundwater is available in most areas of Alaska, except where permafrost is very deep in the northern part of the state. Southcentral and Interior Alaska have the greatest dependence on groundwater. Public water systems in Far North, Southwest, and Southeast Alaska more frequently use streams, rivers, lakes, and rainwater catchments. The largest PWS groundwater withdrawals occur in Anchorage (Southcentral), the Fairbanks North Star Borough (Far North), Matanuska-Susitna Borough (Southcentral), and Kenai Peninsula Borough (Southcentral). Figure F-3 shows the distribution of groundwater sources (i.e., wells) used by PWSs in Alaska, as of November 2011.

[1]Unless otherwise noted, the statistics presented are based on "Estimated Use of Water in the United States in 2005" (U.S. Geological Survey, Circular 1344, 2009).

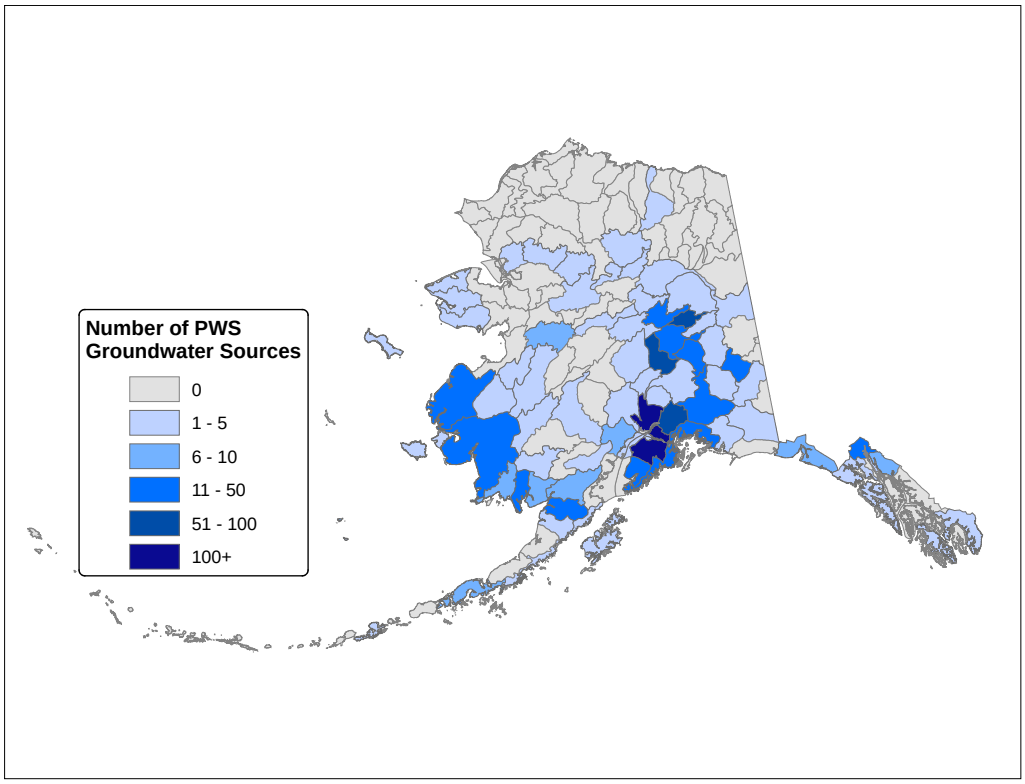


Figure F-3 Distribution of Groundwater Sources used by Community & Non-transient/Non-community Public Water Systems in Alaska

The most productive aquifers in Alaska consist of unconsolidated materials (mainly sand and gravel) derived from glaciers, rivers, and streams. Producing aquifers are typically unconfined (i.e., not protected by a layer of clay or silt)[2], and the depth to groundwater ranges from a few feet to more than 400 feet statewide.

Water Quality: Although water quality data are sparse, most groundwater in Alaska is suitable for domestic, agriculture, aquaculture, commercial, and industrial uses with moderate or minimal treatment. Naturally occurring iron, manganese, and arsenic are the most common treatment problems in groundwater systems. Storage and spills of fuel, along with wastewater disposal, primarily from on-site wastewater disposal (septic) systems, are common threats to groundwater quality statewide. Additionally, a range of other activities have potentially or actually affected groundwater quality (e.g., nonpoint source pollution in urban areas, natural resource extraction in remote locations, and a wide range of potential point sources of pollution).

Prevention of human exposure to contaminated groundwater is a main focus of the DEC Contaminated Sites Program, which remedy new and historical contamination resulting from leaking underground fuel tanks and other releases of oil and hazardous substances. Cleanup and remediation efforts have been ongoing since the late 1980s. As of November 2011, there were 2,376 open contaminated sites, including underground fuel tanks and a variety of above-ground facilities. Groundwater contamination is estimated to be present at about half of these open sites, and approximately 540 open sites are located within the two-year time-of-travel zone for regulated public water systems utilizing groundwater. Cleanup of groundwater is a lengthy process and is the biggest constraint to complete closure of most contaminated sites. During the cleanup, primary efforts are focused on preventing use of the water for drinking and to monitor the status of contamination.

Cost of Contamination: The cost to clean up (remediate) contaminated groundwater can be staggering; costs typically can run into millions of dollars, depending on site conditions. Installing and operating groundwater remediation equipment and long-term groundwater monitoring are common expenses during remediation. DWP and ARWA staff are coordinating DWP activities to provide education to communities. The education is intended to communicate the savings realized when contamination is prevented.

[2]Based on information provided from "Groundwater Atlas of the United States: Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands" (U.S. Geological Survey, HA 730-N, 1999).

Efforts to Protect Groundwater: Protection of groundwater in Alaska is largely accomplished through the regulation of contaminated sites, storage tanks, spill response, and specific waste disposal activities under state and federal programs. DEC manages several programs that contribute to the protection of groundwater, including the following: Contaminated Sites, Prevention & Emergency Response, Industry Preparedness & Pipeline, Solid Waste and Pesticide Management, Drinking Water, Wastewater Discharge Authorization, Water Quality Standards, Assessment, & Restoration, and Facilities. Additionally, ARWA staff, the EPA Underground Injection Control Program, and several other important EPA programs promote the protection of groundwater quality in Alaska.

Division of Water: Although Water Quality Programs within the Division of Water are focused primarily on surface water pollution, they are also protective of groundwater because surface water quality can have an impact on groundwater quality through infiltration and percolation. Division activities that protect groundwater quality include the industrial, domestic, and onsite domestic wastewater permitting programs; water quality protection, stewardship, and restoration projects implemented by the Division or funded through the ACWA grant program; and development of water body recovery plans and TMDL assessments.

The Facilities Section of the Division of Water funds the Village Safe Water Program, which provides grants and engineering assistance to small communities for water, sewer, and solid waste disposal projects. Through the Municipal Matching Grants and Loans (MMG&L) Program, the Facilities Section administers the Alaska Clean Water Fund and the Alaska Drinking Water Fund, which provide loans and engineering support for drinking water, wastewater (sewer), solid waste, and nonpoint source pollution projects, such as waterbody restoration and recovery. These loan programs are designed for cities, boroughs, and qualified private utilities. The Alaska Municipal Water, Sewerage, and Solid Waste Matching Grant Program primarily assists the larger communities and boroughs in Alaska.

Wetlands

The National Wetlands Inventory of USF&WS estimates that the State of Alaska includes 63% of the nation's wetland ecosystems. Activities in these wetlands and their associated waters are regulated under federal and state law and local ordinances because these ecosystems have been shown to perform vital and valuable physical, chemical, and biological functions. Alaska's wetlands function to support the state's diverse human communities, fish and wildlife populations, water resources, and economy.

In addition to being valuable, Alaska's wetlands are highly variable. They include salt and fresh water areas influenced by tides, temperate rain forests, bogs, moist and wet tundra, extensive rivers and streams, large river deltas, and vast areas of black spruce forested wetland. Table F-2 provides a summary of the estimated wetland acreage based on the National Wetlands Inventory.

Table F-3 Estimated Wetland Acreage

Alaska's Wetlands by Major Category with Common Examples

Wetland Category[a]	Common Examples	Estimated Acres
Palustrine	All non-tidal wetlands: muskegs, bogs, forested wetlands, tundra, open water	172,503,400
Estuarine	Bays, salt marshes, beaches	2,131,900
Marine Intertidal	Ocean shoreline	48,600
Total Wetlands		**174,683,900**

[a] Source: USF&WS, *Cowardin Classification of Wetlands and Deepwater Habitat*, 1979

Although Alaska does not have any wetland-specific WQS and neither numeric nor narrative qualitative criteria are specific to wetlands, the Alaska WQS (18 AAC 70) consider wetlands as "waters of the state"; consequently, Alaska's WQS apply to wetlands.

Wetland Trends

The 174,683,900 acres of wetlands in Alaska compose approximately 43% of state surface area. By comparison, the entire remainder of the United States contains 103 million acres of wetlands, representing approximately 5% of the surface area. About half of all Colonial-era wetland acreage in the lower 48 states has been converted to agriculture, development, or other land uses. Although there is no statistically reliable data on statewide wetland losses, USF&WS estimates that Alaska has lost 200,000 acres, or less than 1% of the state's original wetland acreage.

In urbanized and developed areas of Alaska, such as Anchorage, more than 50% of the wetlands have been developed. Significant percentages of wetlands in other urbanized areas, including Juneau, Fairbanks, the Matanuska-Susitna Valley, and the North Slope, have been lost or affected. Because there is a strong correlation between waterbodies that are listed as impaired by DEC and areas where wetlands have been affected or developed, wetlands need restoration and mitigation of impacts associated with development. Wetlands also need protection. Specifically, wetland functions need to be maintained to enhance or protect water quality for drinking water, spawning, and other uses.

Wetlands Management and Functional Assessment

As the lead state agency for wetland issues, DEC has developed a strategy for managing wetlands that consists of the following major activities:

- Permitting and inspections
- Use of a functional assessment and classification system (the hydrogeomorphic approach)
- Assistance to local government and tribal organizations for wetland protection and mitigation efforts.

Permitting and Inspections

DEC participates in the management and protection of wetlands by reviewing and certifying United States Army Corps of Engineers (USACE) dredge and fill permits under the authority of CWA Section 401. This review and certification ensures that construction and other activities do not exceed Alaska's WQS. The Alaska District of USACE completes more than 100 permit actions per year.

DEC reviews individual USACE dredge and fill permits using a risk-based priority system. Under this risk based system, 40% of the projects DEC waived its right to certify permits; and 60% of the projects were certified with stipulations that ensure the project will meet Alaska's WQS.

Functional Assessment and Classification

To ensure that Alaska's wetlands are managed wisely, wetland professionals and policy makers need a regionally based, scientifically valid, consistent, and efficient functional assessment tool. DEC recognized that an assessment tool was needed to help managers and users recognize and distinguish between (1) naturally variable conditions and changes in the functioning of Alaska's wetlands and (2) changes that result from human activities. In response to this need, in 1996 DEC initiated a broad-based, statewide effort to develop a functional assessment approach for Alaskan wetlands.

The hydrogeomorphic approach was selected by DEC and other cooperating agencies and organizations because it offers a rapid and reference-based method of assessment that allows users to recognize human-induced changes in the functions of wetland ecosystems. Guidebooks have been developed to implement the hydrogeomorphic approach to assessment and management of wetlands in various regions of Alaska. Table F-3 identifies areas for which the use of guidebooks has provided an assessment tool to begin or complete wetland permitting and planning activity.

Table F-4 Wetland Assessment Activity

Regions Covered by Guidebooks	Wetland Classes	Time Frame
Interior	Flats	Completed (1999)
Cook Inlet Basin (including Kenai River Watershed)	Slope/Flats Complexes	Completed (2003)
Coastal Southeast and Southcentral	a. Riverine b. Slope River Proximal	Completed (2003)
Near Shore Ecosystems of Southeast and Southcentral	Tidal Fringe	Initiated, discontinued until further notice
Cook Inlet Basin (including Kenai River Watershed)	Riverine	Site data collected, discontinued until further notice
Arctic Coastal Plain	Flats	Not initiated

Assistance to Local Government and Native Organizations

DEC provides statewide technical assistance to local governments for permitting issues and wetland planning. Three local governments have delegated authority from USACE to manage their wetlands.

Several other communities (such as the Ketchikan Gateway Borough and the City of Wrangell) are proposing new wetland planning. DEC is also assisting the City and Borough of Juneau in developing a Wetlands Mitigation Bank. In 2004, DEC, along with federal agencies, successfully helped the Sealaska Native Corporation develop a private mitigation bank.

Tribal Organization Assistance with Wetland Management

DEC assists tribal organizations with wetland and watershed planning. It has helped develop wetland work plans with a sound scientific foundation, guided by the wetland assessment guidebooks.

Wetland Mitigation Banking

DEC participated in developing the Southeast Alaska Regional Mitigation Banking Instrument of Sealaska Corporation. In another wetland mitigation banking effort, the Matanuska-Susitna Borough in collaboration with a private contractor has begun developing a mitigation bank for the Matanuska-Susitna Borough. DEC participated in the initial meetings and is providing technical assistance to the Mitigation Banking Review Team for the wetland functional assessment aspects of the bank.

APPENDIX G Interpretation of the Residues Criterion in Alaska Water Quality Standards for Use in Attainment and Impairment Determinations

RESIDUE CRITERIA

Alaska's water quality standard for *residues* is described in **18 AAC 70.020(b).**

PROTECTED WATER USE CLASSES AND SUBCLASSES; WATER QUALITY CRITERIA; WATER QUALITY TABLE	
(2) MARINE WATER USES	**RESIDUES** **Floating Solids, Debris, Sludge, Deposits, Foam, Scum, or Other Residues**
(A) Water Supply (i) aquaculture	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use. May not cause detrimental effects on established water supply treatment levels.
(A) Water Supply (ii) seafood processing	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shoreline; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
(A) Water Supply (iii) industrial	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use.
(B) Water Recreation (i) contact recreation	Same as (2)(A)(ii).
(B) Water Recreation (ii) secondary recreation	Same as (2)(A)(ii).
(C) Growth and Propagation of Fish, Shellfish Other Aquatic Life, and Wildlife	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe, for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause

	a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	May not make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shoreline; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.

The application of the water quality standard for residues for permitted facilities is established through the implementation of the narrative criteria (above) in concert with the ZOD provisions (below), also within the WQS.

The water quality criteria for residues are narrative criteria with several provisions that are subject to interpretation. As such, it is overly simplistic to characterize the residues standard as "zero discharge." The first sentence of the criteria for most uses provides that residues "[m]ay not, alone or in combination with other substances or wastes, make the water unfit or unsafe, **for the use**..." [emphasis added] This is a "use-based" criterion—meaning, a use impairment determination must be made to trigger a water quality violation or a significant non-compliance situation.

The second sentence within the narrative criteria for some uses states that residues "may not cause a sludge, solid, or emulsion to be deposited" on the surface, bottom, or shoreline. This prohibition against deposits is the most restrictive provision of the residue criteria. But the prohibition is not treated as a zero discharge standard in all instances. For example, DEC permits ZODs under 18 AAC 70.210, mixing zones under 18 AAC 70.240–270, and variances under 18 AAC 70.200.

In addition, DEC recognizes an implied de minimus exception to the "no deposit" criterion, so that a person skipping a stone or cleaning a fish is not considered to be in violation of state law. To date, DEC has not written any guidance about the scope of that de minimus category, but rather implements it on an ad hoc basis. EPA and the courts have long recognized the inherent authority of agencies to exempt de minimus activities from the coverage of the law. For example, see Ober v. Whitman, 243 F.3d 1190, 1194-95 (9th Cir. 2001). DEC asserts and exercises such authority in its interpretation and implementation of the residues standard. A use impairment determination based on a narrative water quality criterion is subject to an analysis and a determination by DEC.

The residue standard applies to any residue discharge (whether permitted or unpermitted); however, one of the most prevalent applications of the residues standard is to permitted discharges of residues in marine waters from seafood processing facilities and LTFs and the authorization of ZODs for these permits.

Alaska has an explicit provision within its WQS that allows for the authorization of ZODs for residues in 18 AAC 70. 210.

Seafood processing facilities and LTFs in Alaska are typically issued ZODs in the facility's permit for the residues discharges. Seafood processing facilities are generally issued a 1-acre ZOD and LTFs are issued a "project area" ZOD. Additionally, it is important to recognize that exceedance of a ZOD is not

equivalent to impairment; rather, exceedance of 1.5 acres of continuous residues coverage is the impairment standard.

ZONES OF DEPOSIT

18 AAC 70.210. ZONES OF DEPOSIT.

(a) The department will, in its discretion, issue or certify a permit that allows deposit of substances on the bottom of marine waters within limits set by the department. The water quality criteria of 18 AAC 70.020(b) and the antidegradation requirement of 18 AAC 70.015 may be exceeded in a zone of deposit. However, the standards must be met at every point outside the zone of deposit. In no case may the water quality standards be violated in the water column outside the zone of deposit by any action, including leaching from, or suspension of, deposited materials. Limits of deposit will be defined in a short-term variance issued under 18 AAC 70.200 or a permit issued or certified under 18 AAC 15.

(b) In deciding whether to allow a zone of deposit, the department will consider, to the extent the department determines to be appropriate,

(1) alternatives that would eliminate, or reduce, any adverse effects of the deposit;

(2) the potential direct and indirect impacts on human health;

(3) the potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence;

(4) the potential impacts on other uses of the waterbody;

(5) the expected duration of the deposit and any adverse effects; and

(6) the potential transport of pollutants by biological, physical, and chemical processes.

(c) The department will, in its discretion, require an applicant to provide information that the department considers necessary to adequately assess (b)(1)-(6) of this section. In all cases, the burden of proof for providing the required information is on the person seeking to establish a zone of deposit. (Eff. 11/1/97, Register 143)

The Zones of Deposit section states, in part, "(t)he department will, in its discretion, issue or certify a permit that allows the deposition of substances on the bottom of marine waters within limits set by the department." The ZOD section allows the water quality criteria of 18.70.020 and the antidegradation policy of 18 AAC 70.015 to be exceeded in a ZOD.

The federal WQS regulation in Title 40, Section 131.13, of the *Code of Federal Regulations* authorizes states to have policies, including variances and ZODs, in their WQS that generally affect the application and implementation of state WQS. The rationale for allowing ZODs or variances from WQS is for a state to maintain standards that are ultimately attainable. By maintaining the standard rather than

changing it, the state would ensure further progress is made in improving water quality. With the variance provision or ZOD provision, federal NPDES and state permits may be written so that reasonable progress is made toward attaining the standards without violating Section 402(a)(1) of the CWA.

An authorized ZOD is fairly equivalent to a mixing zone (which is also authorized in some cases for discharge permits) in that it is an area permitted to temporarily exceed the residue standard in a limited area that does not significantly degrade the quality of the waterbody as a whole or the designated uses. Permitted ZODs should be able to recover after discharges cease through biodegradation and/or recolonization of any lingering residues on the marine bottom. It is not necessarily the solids themselves that are the problem; the problem is the smothering of the benthic community. DEC would not permit a residue discharge that resulted in a permanently sterile bottom substrate resulting from toxic contaminants.

It should be noted that the residues water quality standard was identified as a high priority for a forthcoming Triennial Review of the WQS. Any outcomes from that review could result in actual changes to the criterion and possibly affect this residues policy and result in changes to the criteria for the waterbody categories.

History of the One-Acre Threshold

In 1985 Governor Sheffield convened the Alaska Timber Task Force to develop a common set of LTF siting criteria. The Task Force created a Technical Subcommittee that was comprised of stakeholders including EPA, USFS, USF&WS, National Marine Fisheries Service, USACE, Governor's Office, DEC, DNR Division of Forestry, ADF&G Habitat Division, United Fisherman of Alaska, representatives of the timber industry, a member of the public-at-large, and Sealaska Native Corporation. This group produced the document known as the 1985 *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, more commonly known as the "LTF Guidelines."

This document establishes the interim intertidal and submarine bark accumulation threshold of 1 acre. The document states, "An interim guideline for threshold bark accumulation levels and cleanup when exceeding those levels is being used due to a lack of information. Technical data are needed to evaluate practicable threshold accumulation levels and to evaluate technical feasibility of various options for managing accumulation, such as removal or other control procedures" (C6. Bark Accumulation: Discussion: paragraph 2). Specifically, guideline C6 states:

> The regulatory agency(ies) will impose an interim intertidal and submarine threshold bark accumulation level. When accumulations exceed the threshold level, cleanup – if any – will occur at the discretion of the permitting agency(ies). The interim threshold bark accumulation level is described as 100% coverage exceeding both 1 acre in size and a thickness greater than 10 cm (3.9 inches) at any point.

The LTF Guidelines include recommended criteria for selecting the location for future LTFs. The siting criteria were designed, in part, to reduce bark accumulation of LTFs. The LTF Guidelines Committee

identified the 1-acre figure as an "interim threshold bark accumulation level" until additional research could be completed. The discussion section in the guidelines states:

> Through siting, transfer system selection and solid waste management, the amount of bark lost and accumulating in intertidal and submarine areas is prevented or significantly diminished. Bark accumulation is still expected to occur in some areas promoting the need for this guideline.

The Technical Subcommittee was tasked with developing LTF guidelines that "would be beneficial for all parties involved in the permitting, construction, and operation of LTFs to have a common set of criteria (guidelines) from which to work when **designing** (emphasis added) facilities and reviewing permit applications for these facilities" (Introduction, page 1, paragraph 3). The section titled The Use of Guidelines (page 2, paragraph 2) states, "The guidelines are comprehensive and may apply to any site being evaluated for LTF permits." It was never the intent of the Technical Subcommittee for agencies to retroactively apply this threshold to existing facilities because they were located and constructed prior to adoption of the guidelines and there was no anticipated permit workload associated with existing facilities. Some of these facilities had been in operation for 20 years prior to the development of siting guidelines without any permit limits on marine accumulation. Although additional research was not completed as planned, the use of the interim 1-acre threshold level has continued to be applied routinely in most log transfer and seafood discharge permits.

Background on General Permits for Log Transfer Facilities

In March 2000, EPA issued two GPs for LTFs. DEC certified the EPA permits, and adopted them as state GPs; DEC implements the state GPs separately from the EPA GPs. The state issues a written authorization to the LTF owner to operate under the applicable GP after finding that the authorization is consistent with the Antidegradation Policy (18 AAC 70.015) of the Alaska WQS. The state also approves a project area-wide ZOD (18 AAC 70.210) following an assessment of the information provided by the applicant.

One of the GPs, referred to as "pre-1985" GP (AK-G70-0000), applies to shore-based LTFs that received a Section 404 permit from USACE before October 22, 1985, and never received an individual NPDES permit. The original Section 404 permits never established any limits on the discharge of bark and wood waste into the marine environment. The pre-1985 GP modified the terms of the Section 404 permits and for the first time established a permit threshold of 1 acre for accumulation of continuous cover bark for these facilities. The original 404 permits now comply with all relevant sections of the CWA. A 1-acre threshold, instead of a 1-acre permit limit, for continuous cover bark was incorporated into the permit because it was known that some pre-1985 facilities had continuous cover bark deposits greater than 1 acre. The GP requires these facilities to complete remediation planning and plan implementation.

The other GP, called the "post-1985" GP (AK-G70-1000), applies to the following classes of LTFs:

- New LTFs that have not received individual NPDES permits
- LTFs that have current individual NPDES permits and choose to seek coverage under the GP

- LTFs that have individual NPDES permits that have expired or have been administratively extended by EPA, and that wish to continue or resume operation
- Offshore LTFs and offshore LSAs that existed either before or after 1985, and that wish to continue or resume operation

Individual NPDES wastewater discharge permits issued before adoption of the two GPs contained a fixed 1-acre (not to exceed 10 cm in thickness at any point) ZOD authorized by DEC.

Bark monitoring is required annually for all permittees whose operations transfer a total of 15 million board feet or more during the life of the LTF general permit, and that are located in water depths less than 60 feet at mean lower low water. The majority of LTFs operating under an individual or general NPDES permit are required to submit to DEC and EPA an annual dive survey report documenting the nature and extent of continuous and discontinuous bark residue accumulations at their sites. LTFs transferring less than 15 million board feet of timber volume are not required to conduct annual dive surveys; however, a great majority of the LTFs are required to conduct annual dive surveys.

The two April 2004 EPA GPs for LTFs are substantially different from previous individual permits in terms of the ZODs authorized under the permits. The GPs adopted a "project area" ZOD, which recognizes and authorizes the deposition of bark residues in the project area. The project area is defined as the entire marine operating area of an LTF, either shore-based or offshore, including the following components: shore-based log transfer devices; shore-based log transfer, rafting, and storage areas; helicopter drop areas; vessel and barge loading and unloading areas; off-shore LSAs not adjacent to a shore-based LTF; bulkheads, ramps, floating walkways, docks, pilings, dolphins, anchors, buoys, and other marine appurtenances; and the marine water and ocean bottom underlying and connecting these features. The LTF operator identifies the size of the project area in the Notice of Intent or Notification. This project area usually coincides with the DNR tidelands lease area.

The state GPs also establish a 1-acre "threshold" limit for continuous, or 100%, bark cover within the project area. If that threshold is exceeded, the operator is required to submit a remediation plan to DEC, which is intended to reduce continuous bark cover to less than 1 acre. DEC must approve the remediation plan, which becomes part of the operator's state GP authorization. The purpose for establishing the project area ZOD in the GPs is to recognize that log rafting and log storage may occupy considerable area, and are expected to cause the accumulation of discontinuous bark (less than 100% cover) and trace bark (less than 10% cover). Discontinuous and trace bark are considered to have a minimal impact on marine organisms and habitat, and can occur without limit in the project area.

As a result of the 2002 final decision in the adjudication of the DEC Section 401 certification of the two EPA GPs, DEC cannot authorize facilities located on Section 303(d) impaired waterbodies to discharge under either GP. An LTF on an impaired waterbody must obtain an individual state wastewater permit. As part of LTF permitting, DEC conducts an anti-degradation review and finding, and makes all findings required under the ZOD regulations for each facility applying for residue discharge authorization.

Application of Zones of Deposits for Residues to Seafood Processing Facilities

As described above, the 1-acre ZOD in permits had its initial application through the LTF Guidelines for new facilities in the 1980s. EPA consequently adopted the 1-acre threshold as a compliance limit in NPDES permits for LTFs and the EPA NPDES GP for seafood processors (AK-G52-0000) in the mid-1990s.

In 2001, DEC again certified a ZOD of 1.0 acre when this EPA GP for nearshore and shore-based seafood processing facilities was renewed. Currently this GP authorizes approximately 235 processors. Historically, this seafood GP specified that nearshore and shore-based facilities implement a seafloor monitoring program to ensure compliance with the WQS for settleable residues in marine waters.

It should be noted that individual NPDES seafood permits have authorized residues deposits greater than the 1-acre threshold found in the AK G52-0000 seafood GP. For example, in the mid-1990s DEC issued a Section 401 certification for a 2-acre ZOD for an outfall associated with a seafood processing facility, based on the bathymetry of the bay. For seafood facilities with individual NPDES permits, a case-by-case determination of an acceptable ZOD size for residues has been the approach used since 1987.

The agencies have historically made a distinction between newly permitted sites and existing permitted sites in arriving at an allowable ZOD size determination.

Reporting of Dive Survey Acreages

Previous reports of the actual acreage of bark coverage observed in dive surveys and listed in Alaska's 1998 Section 303(d) report could lead the public to believe that all reported continuous cover was a violation of permit conditions or of the Alaska WQS. For example, an LTF with 3.1 acres of continuous bark coverage is actually 2.1 acres over the 1-acre ZOD threshold for continuous bark coverage. Hence, the 1998 303(d) listing narrative might have stated that "dive survey information from November 1997 demonstrates a significant exceedance of the interim threshold bark accumulation level at 3.1 acres of bottom coverage."

In Alaska's Integrated Reports, DEC reports dive survey acreages as "exceedances over the one acre ZOD threshold." For example, "the dive survey information from November 2001 demonstrates an exceedance of 2.1 acres above the permitted bark accumulation level of continuous bark coverage of 1.0 acre." This reporting approach more accurately portrays actual exceedances of the permitted threshold. The level of timber harvest is significantly lower than in the past. Reduced loading associated with reduced volume transferred is likely to act to reduce continuous cover accumulation over time. Limited research to determine the effect of transfer method and volume transferred on bark accumulation has established a weak statistical correlation between volumes transferred and bark accumulation. A similar correlation has not been established for the transfer method. As described above, the 1-acre ZOD in permits had its initial application through the LTF Guidelines for new facilities in the 1980s. EPA consequently adopted the 1-acre threshold as a compliance limit in NPDES permits for LTFs and the EPA NPDES GP for seafood processors (AK-G52-0000) in the mid-1990s.

Criteria for Waterbody Categories

DEC is not proposing to re-categorize waterbodies previously determined to be impaired for residues associated with LTFs simply because the GPs incorporate a project area ZOD. The basis for placing waters impaired by bark residues on the 303(d) list in 1998 was the 1-acre ZOD established in individual NPDES permits. For LTFs in Alaska authorized under the new GPs, the threshold limit for continuous-cover bark in the GPs remains 1 acre. The project area ZOD effectively applies to continuous, discontinuous and trace bark. The project area ZOD could be a basis for Section 303(d) listing only if significant deposits of bark and wood debris were documented outside of the project area.

For waterbodies associated with LTFs or seafood processing, dive survey protocols and reporting should be in accordance with the requirements contained in the appropriate permits.

In making attainment determinations on waters associated with am LTF and where DEC has received a Notification or Notice of Intent to Operate under a General Permit, DEC makes its categorization decision after evaluating the sufficiency and credibility of the dive survey data on file and required under the GPs and the information provided in the Notice of Intent.

Category 1 Waterbody

Category 1 waterbodies are waters attaining water quality standards. Waterbodies are placed in this category if data support a determination that the WQS and all of the uses are attained.

Waterbodies are placed in this category when water quality data and information show that all uses are being attained.

Category 2 Waterbody

Category 2 waterbodies are those waters that are attaining some designated uses and for which insufficient or no data and information are available to determine whether remaining uses are attained:

A waterbody is placed in Category 2 if a determination is made that the waterbody is attaining some uses or standards. Waterbodies with recent dive survey reports and for which attainment with a 1.0-acre threshold for continuous coverage of residues has been demonstrated are placed in Category 2. For a waterbody associated with residue discharge, if a facility is reporting 1 acre or less of continuous residue coverage the waterbody is placed in Category 2.

A waterbody that was determined to be impaired from residues and for which continuous coverage of residues less than 1.0 acre has been documented is placed in Category 2.

Category 3 Waterbody

Category 3 waterbodies are waters with insufficient or no data and information to determine if any designated use is attained. Waterbodies are placed in this category if the data or information to support an attainment determination for any use is not available. Alaska has generally reliable information and

data on facilities that discharge residues because of dive survey reporting requirements associated with residue discharge permits.

Supplementary data and information should be developed or monitoring should be scheduled to assess the attainment status of these waters, as needed.

Criteria for Placing Waters in This Category

Alaska's water resources include more than 3 million lakes greater than 5 acres in size, 365,000 miles of rivers and streams, more than 174,000,000 acres of fresh water wetlands, and 36,000 miles of coastal shoreline. Therefore, Alaska has a large number of waterbodies for which insufficient, inadequate, or little to no data or information exists to support attainment or impairment determinations. DEC expects that the majority of these waters would be in Category 1 (i.e., waters attaining standards for all uses), if sufficient resources existed to assess them. Category 3 includes waters formerly known as "open files" and waters nominated for assessment through ACWA. Actions that trigger opening a file can include nomination from the public, a public complaint, a newspaper report, or more rigorous information, such as water quality reports or assessments. These waters are placed in Category 3. DEC maintains files on some of these waterbodies, which are identified in Appendix C.

Category 4b Waterbody

Category 4b waterbodies are impaired waters but do not need TMDLs because other pollution controls in place and the waters are expected to attain WQS within a reasonable time period.

A waterbody is placed in Category 4b if LTF dive survey reports document greater than 1.5 acres of continuous residues coverage; a determination is made that the water is impaired; and there is an approved remediation plan under the LTF GPs or an individual state wastewater discharge permit. Waterbodies that are under EPA compliance orders for seafood residue violations may also be considered for placement in Category 4b.

The requirements for preparing and submitting remediation plans, taken from DEC Certificates of Reasonable Assurance for the two LTF GPs, are identified in the document *Guidance For Preparing Remediation Plans Under Alaska's General Permits For Log Transfer Facilities***.** Several key details of the requirements are summarized below:

- If existing continuous bark and wood debris cover exceeds both 1 acre and a thickness of 10 cm at any point, an operator must submit a remediation plan to DEC within 120 days, unless DEC grants additional time.
- A proposed remediation plan must evaluate historical and future log transfer processes and volumes; environmental impacts of existing deposits of bark and wood debris and the environmental impacts of methods to reduce continuous coverage; and methods to reduce continuous bark coverage, including alternative methods of log transfer and transport, operational practices, and technically feasible methods and costs of removing bark.

- The remediation plan must identify a set of feasible, reasonable, and effective measures to reduce continuous bark cover to both less than 1 acre in area and 10 cm in thickness at any point.
- If removal of bark is proposed, the remediation plan must specify areas, methods, volume, and timing of removal; the method of disposal for the removed material, including practices to ensure meeting WQS; and the cost of removal by the proposed methods and alternatives considered.
- The plan must include a performance schedule and performance measures for the its implementation.
- The plan may describe measures that can be implemented in phases, with continued bark monitoring surveys and with future modification of the remediation plan based upon progress in reducing the continuous coverage.
- DEC will approve, approve with modification, or deny a proposed remediation plan within 90 days of receipt.
- An approved remediation plan constitutes an enforceable condition of the GP.

The LTF GPs do not require EPA approval of the remediation plan. EPA requires that the LTF operator update the Pollution Prevention Plan to outline additional controls that will be implemented to reduce or eliminate additional residues accumulation. The revised Pollution Prevention Plan will not include measures intended to reduce the current bark accumulation to less than 1.0 acre.

The objective of remediation planning is to implement the most appropriate site-specific treatment with the goal of reducing the extent of continuous residues coverage to less than 1.0 acre.

Category 5 Waterbody

A waterbody is listed in Category 5 and on the Section 303(d) list when a determination is made that the water is impaired by residues. Category 5 waters require that a TMDL or other equivalent pollution controls are developed to attain WQS.

Section 303(d) of the CWA requires a list of waterbodies that are not expected to meet WQS without additional controls. Many Section 303(d) designated waters have not undergone comprehensive water quality assessments to determine either the extent of water quality impairment or whether existing controls are adequate to achieve the standards. DEC closely scrutinizes waterbodies to determine whether suspected water quality violations were thoroughly investigated and documented. This approach is designed to prevent the listing of waterbodies with only inconclusive or circumstantial data or observations.

For waterbodies with facilities that are permitted to discharge residues**,** such as a seafood processor or LTF, the impairment standard is 1.5 acres of continuous cover. If two or more consecutive dive survey reports adequately document the presence of 1.5 acres or more of continuous residue cover, the waterbody is placed on the Category 5/Section 303(d) list.

G. Residues Interpretation

A waterbody with an LTF that has a current ZOD authorization is placed in Category 5 if two or more consecutive dive survey reports document more than 1.5 acres of continuous residues coverage and greater than 10 cm of depth at any one point, unless DEC has approved a remediation plan for that waterbody. A waterbody is placed in Category 5 when a submitter has failed to implement an approved remediation plan (LTF) according to its schedule. Exceptions may include waterbodies where ZODs were authorized at greater than 1.5 acres.

If DEC approves a remediation plan on a Category 5/Section 303(d) listed waterbody that is reporting more than 1.5 acres of continuous coverage of bark on the bottom prior to the next Section 303(d) list, the waterbody is placed in Category 4(b) in the next Section 303(d) list.

A waterbody associated with a facility operating under either of the LTF GPs that is reporting continuous coverage of residues of more than 1.5 acres is considered for Category 5/Section 303(d) listing if one of the following conditions is met: (1) the permittee failed to submit a remediation plan, or (2) a remediation plan has been submitted, but the permittee is failing to implement or is not meeting milestones set forth in the approved remediation plan.

A waterbody associated with an LTF where there is no currently permitted or active discharge to the water, but where the last known dive survey reported more than 1.0 acres of continuous residues coverage on the marine seafloor, is placed on the Category5/Section 303(d) list.

A waterbody associated with a seafood processor with a current ZOD authorization with two or more dive survey reports that documents continuous residues coverage of more than a 1.5-acre area of seafood waste is placed in Category 5. Exemptions include waterbodies where ZODs were authorized at greater than 1.5 acres. Waterbodies with legacy site seafood piles (no current dischargers) that are determined to be more than 1 acre of continuous residue coverage may be considered for Category 5/Section 303(d) listing.

For all Category 5/Section 303(d) waterbodies listed for residues after 1998 based on two dive surveys, the operator must document through two consecutive dive surveys that the areal extent of continuous cover residues has been reduced to less than 1.5 acres to have the waterbody removed from the Category 5/Section 303(d) list. For all Category 5/Section 303(d) waterbodies listed for residues in 1998 or earlier, based on 1 acre and on one dive survey, the operator must document through one dive survey that the areal extent of continuous cover residues has been reduced to less than 1 acre in order to be removed from the Category 5/Section 303(d) list. If the areal extent of continuous cover is not declining in size, DEC will initiate permit modification or TMDL development.

The use of a greater than 1.5 acres of continuous coverage impairment standard for log transfer and seafood processing facilities with ZODs is based on several factors:

- **Permits Establish Limits, not Water Quality Standards.** The fixed 1-acre ZOD used for previous impairment determinations is a permit limit and not a water quality standard. Alaska's ZOD regulations (18 AAC 70.210) allow the deposition of substances on the bottom of marine waters within limits set by DEC. However, the standards must be met at every point outside the ZOD. Permits use the WQS as a basis for setting effluent "limits" or for allowing flexibility from the WQS.

DEC specifies the criteria that can be exceeded in a permit, short-term variance, or certification. If a discharger is granted a ZOD within a permit, the permittee can only exceed the criteria that have been identified in its permit, short-term variance, or certification.

- **Confidence of Dive Survey Information.** Although EPA NPDES individual permits contained protocols for dive surveys at LTFs, it appears that dive methods were not implemented consistently. In addition, NPDES permits included no method for calculation of bark area, which often was overestimated. These inconsistencies compared to current protocols in the GPs raise the issue of the reliability of dive survey information that resulted in previous listing decisions, and make it difficult to track trends in actual bark accumulation patterns. For instance, a 1997 dive survey on bark residues that resulted in the 1998 impairment determination and Section 303(d) listing reported the presence of measurable bark or trace coverage. The reported 9.5-acre bark footprint was based on plots with measurable bark rather than continuous-cover bark.

  The dive survey requirements contained in Seafood GPs are based on seafood waste residue dispersal patterns and seafloor monitoring. The lack of a perimeter dive survey requirement leads to uncertainty in the impairment determination.

- **Uncertainty in Current Approved Method and Acreage Calculations of Dive Survey Reports.** DEC has noted that the current required method of acreage calculation is not used correctly. As part of the dive survey review, DEC re-calculates continuous cover based on dive survey reports. For facilities that were Section 303(d) listed in 1998, DEC calculations indicate that five of the seven 2002 dive survey reports for these facilities overstated the extent of continuous cover. Of all the reports reviewed to date since the inception of the two LTF GPs, only one report understated the extent of continuous cover. Because of uncertainty about the extent of continuous cover, and by using an impairment standard of 1.5 acres of continuous coverage, DEC is confident that impairment decisions truly reflect actual impairment.

- **Natural Reduction of Residues Deposits.** Dive survey reports for LTFs that transferred little or no timber volume over a number of years often showed considerable reduction in the areal extent of continuous coverage. The reduction was likely due to natural sedimentation and/or current dispersement. For example, the areal extent of continuous bark coverage on the bottom of Corner Bay declined from 1.2 acres in 1996 to 0.6 acre in 2001. No logs were transferred during this period, and no active remediation occurred.

  The level of timber harvest is significantly lower than in the past. Reduced loading associated with reduced volume transferred is likely to act to reduce continuous cover accumulation over time. Limited research to determine the effect of transfer method and volume transferred on bark accumulation has established a weak statistical correlation between volumes transferred and bark accumulation. A similar correlation has not been established for the transfer method.

- **A 1.0-Acre Accumulation Threshold and a 1.5-Acre Impairment Standard.** There is clear and pervasive language within the LTF Guidelines that establishes the 1-acre ZOD standard as a threshold standard for cleanup, and not for use as an impairment standard.

- **Impacts to the Biological Community.** The use of ZODs has been historically recognized and generally accepted for dischargers of residues to the marine environment in Alaska. The hearing officer findings, for instance, from the LTF adjudication of the DEC proposed Section 401 certifications of the two federal GPs found that the discharge of bark and wood debris sited and operated in conformity with the permit has limited and localized impacts on the benthic community within the project area. The hearing officer also asserted that such discharges would have no discernible effect on the benthic environment as a whole in the geographic area covered by the GPs. Patchy and discontinuous bark residue deposition on the bottom is authorized under the LTF GPs. Additionally, an antidegradation finding is made for each LTF facility permit.

It is recognized that excessive residue coverage of more than 1.5 acres that is continuous and in excessive depth accumulations can have adverse impacts. Facilities that are operating under permit conditions with ZODs are accepted as not adversely affecting the biological community or causing irreparable harm.

Under the LTF GPs, exceeding the 1-acre continuous-cover threshold triggers the requirement to develop a remediation plan.

Removal of Waterbodies from the Category 5/Section 303(d) List Determined to Be Impaired from Residues

The following protocols are applied to all waterbodies associated with a permitted facility and Category 5/Section 303(d) listed for residues, regardless of an active discharge on site:

- For waterbodies Section 303(d) listed after 1998 and determined to be impaired for residues based on two or more dive surveys:
  - DEC requires two consecutive dive surveys documenting that continuous residues coverage is no more than 1.5 acres before the waterbody is eligible for removal from the Category 5/Section 303(d) list and for placement in either Category 1 or 2.
- For waterbodies Section 303(d) listed in 1998 or earlier (based on 1.0 acre) and determined to be impaired for residues based on one dive survey or best professional judgment:
  - DEC requires one dive survey documenting that continuous residues coverage is no more than 1.0 acre before the waterbody is eligible for removal from the Category 5/Section 303(d) list and placement in Category 1 or 2.
- In addition to consideration of the continuous residues coverage standard of 1.5 acres, DEC may consider biological assessment information, such as sediment profile imaging, in a determination to remove a water on the Section 303(d) list for residues.

APPENDIX H Alaska Clean Water Actions (ACWA) Priority Ranking

The following table identifies the rankings assigned to Alaska waterbodies by the Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, and Alaska Department of Natural Resources, which are abbreviated as F&G, DEC, and DNR, respectively in the table below. The final column, labeled "MAX," identifies the agency that made the highest ranking and that ranking. Each agency ranked factors for a different component: F&G rated aquatic habitat, DNR rated water quantity, and DEC rated water quality. Additional column abbreviations are Lwr for lower and Med for medium. This table was generated in November 2011.

Waterbody Ranking by Agency

Name	DEC	DNR	FG
Akutan Harbor	Med	—	—
Allison Creek	—	—	—
Anchor Pt to Happy Valley Creek	—	—	—
Anchor River	High	—	High
Anvil Creek	High	High	High
Auke Bay	High	—	Med
Auke Creek	High	Med	Med
Auke Lake	High	—	Med
Auke Nu Cove	High	—	High
Auke Nu Creek	Med	Lwr	Med
Barabara Creek	Med	—	—
Bass Creek (Chuitna River tributary)	—	—	—
Battle Creek	—	—	—
Bear Cove	Med	—	—

Bear Creek (Becharof)	Med	Lwr	Med
Bear Creek (Hogatza)	—	Lwr	High
Bear Creek (Homer)	Med	Med	—
Bear Creek (Hope)	Med	Med	Med
Beaver Creek (Kenai)	Med	—	Med
Beaver Inlet	Med	—	Lwr
Beaver Lake	Med	Lwr	Med
Bell Flats	Med	Med	Med
Beluga Lake (Homer)	Med	Med	—
Beluga Slough	—	—	—
Benny Creek	Lwr	Med	—
Berners Bay	Med	—	High
Bidarka Creek	Med	—	Lwr
Big Beaver Lake	—	—	—
Big Lake	High	—	High
Birch Creek (Talkeetna)	Lwr	Med	Med
Birch Creek, Upper Drainage	High	—	Med
Birch Lake	Med	Med	Med
Black Bear Creek	Med	Med	High
Bodenburg Creek	Med	—	High
Bolio Lake	Lwr	Lwr	Lwr
Bons Creek	Med	Med	Med
Bradfield River	Med	Lwr	High
Bridge Creek	Med	High	Med

Cabin Creek	Med	Lwr	—
Cache Creek	Med	Med	Med
California Creek	Med	Med	Med
Campbell Creek	High	—	High
Campbell Lake	High	—	Med
Canoe Lake	—	—	—
Captains Bay	High	—	—
Caribou Creek	Lwr	Lwr	—
Carlanna Creek	High	Med	High
Cedar Bay	Med	—	—
Chatanika River	Med	—	Med
Chena River	High	—	High
Chena Slough	High	—	Med
Cheney Lake	High	—	High
Chester Creek	High	—	High
Chilkat River	Med	—	Lwr
China Poot Bay	Med	—	—
China Poot Creek	Med	Lwr	Lwr
Chuit Creek	—	—	—
Chuitna River	High	—	High
Clear Creek	Med	Med	Lwr
Clearwater Creek	High	Med	High
Clearwater Lake	—	Med	Lwr
Cold Bay	High	—	—

Colleen Lake	Lwr	—	—
Colville River/Umiat Lake	High	—	—
Connors Lake	Med	Med	Med
Cooper Creek	Lwr	—	High
Copper River	High	—	High
Corner Bay	Med	—	—
Cottonwood Creek	High	—	High
Cottonwood Lake	Med	—	High
Crab Bay	Med	—	—
Crooked Creek	High	—	Med
Crow Creek	Med	Med	Med
Cube Cove	Med	—	—
Dark Lake	Med	Med	Med
Deep Creek	High	—	High
Delong Lake	Med	—	Med
Deshka River (Kroto Creek)	High	—	High
Diamond Creek	Med	—	—
Dog Salmon Creek	Med	Lwr	Med
Dogfish Bay (Koyuktolik Bay)	Lwr	—	—
Donlin Creek	—	—	—
Dora Bay	Med	—	—
Dora Lake	Med	Lwr	Med
Dry Creek (Nome)	—	—	—
Duck Creek	High	High	Med

Duck River	—	—	—
Dutch Harbor	High	—	—
Eagle River	High	—	Med
Eagle River Flats	Med	—	—
East Creek	Med	Med	—
East Port Frederick	High	—	—
Edmonds Lake	—	—	Lwr
Egegik River	High	—	Med
Eklutna River	Med	High	Med
Eldred Passage	Lwr	—	—
Elfin Cove	Med	—	Med
English Bay River	Med	Lwr	—
Eskimo Creek	—	—	—
Eyak Lake	High	—	Med
Eyak River	—	—	—
Falls Creek	—	Lwr	Lwr
Falls Creek (Gustavus)	—	—	—
Falls Creek (Kachemak)	Lwr	—	—
Finger Lake	Med	—	—
Fire Cove	Med	—	—
Fire Lake	—	Lwr	Lwr
Fish Creek (Anchorage)	—	—	Lwr
Fish Creek (Wasilla)	Med	High	Med
Fortymile	Med	Med	Med

Fourth of July Creek (Seward)	—	—	—
Fox River	Med	Lwr	High
Freshwater Creek	Med	Lwr	Med
Fritz Creek	Med	High	High
Fubar Creek	Med	—	Lwr
Funny River	Med	Lwr	High
Furrow Creek	High	—	—
Garrison Slough	Med	—	—
Gastineau Channel	Med	—	High
Gibson Cove	Med	—	Lwr
Glacier Creek	High	—	High
Glacier Creek (Nome)	—	—	—
Goldstream Creek	High	—	High
Goodnews River	Med	—	Med
Goose Bay	Med	—	Med
Goose Creek	Med	Med	Lwr
Goose Lake	Med	—	Lwr
Granite Creek	High	—	High
Grant Creek	—	—	—
Grant River	—	—	—
Greens Creek	Med	—	—
Gulkana River (Lower River)	—	—	—
Gulkana River (upper)	High	Lwr	Med
Gunnuk Creek	High	—	Med

Halibut Cove	High	—	Med
Hamilton Bay	Med	—	—
Hammer Slough	Med	—	Med
Harding Lake	Med	—	Med
Harris River	—	Med	High
Hatchery Creek	High	Lwr	Med
Hawk Inlet	—	—	Med
Herring Bay Creek	High	Med	High
Herring Cove of Silver Bay	—	—	—
Hideaway Lake	Med	Med	—
Hoadley Creek	High	Lwr	High
Hobart Bay	Med	—	—
Hogatza River	Med	—	Med
Homer Harbor	High	—	Med
Hood/Spenard Lake	High	—	—
Horseshoe/Island Lakes	Med	—	Med
Hospital Lake	Lwr	Lwr	—
Iliamna Lake	High	Med	Med
Iliuliuk Bay	—	—	—
Iliuliuk Harbor	High	—	—
Illinois Creek	Med	—	High
Indian River	Med	High	High
Jakolof Bay	Med	—	Lwr
Jewel Lake	High	—	Med

Jim Creek	Med	Lwr	High
Jim Lake	Med	Lwr	High
Johnson Creek	Med	Med	Med
Jones Lake	Med	Med	—
Jordan Creek	High	—	High
Juneau Creek	Med	Lwr	Lwr
Kachemak Bay	Med	—	—
Kalmbach Lake	Lwr	Med	—
Kanektok River	Med	Lwr	Med
Kantishna River	Lwr	Med	Lwr
Kasilof River	High	—	High
Kaskanak Creek	Med	Lwr	Lwr
Katlian River	High	—	High
Kazakof Bay	Med	—	—
Kenai River	High	—	High
Ketchikan Creek	High	—	Med
King Cove	High	—	—
King Salmon Creek	—	—	Med
Kitkun Bay	Med	—	Lwr
Klag Bay	Med	—	Lwr
Klawock Inlet	Med	—	—
Klutina River	—	—	—
Knutson Creek	—	—	—
Kobuk River	High	High	Lwr

Kodiak Landfill Creek	Lwr	Lwr	—
Kogoluktuk River	—	—	—
Koktuli River - North Fork	Med	Lwr	High
Koktuli River, South Fork	Med	Lwr	High
Kotzebue Lagoon	High	—	—
Kuparuk River	Lwr	Med	High
Kuskokwim River	Med	—	—
Lab (Labouchere) Bay	Med	—	Med
Lake Clark	High	—	—
Lake Creek	Med	Med	High
Lake Louise	High	—	Med
Lake Lucille	High	—	—
Lake McDermott	—	—	—
Lake Otis	Med	—	Med
Lemon Creek	High	—	High
Lilly Lake	Med	Lwr	Med
Little Campbell Creek	—	—	High
Little Campbell Lake	Lwr	—	Med
Little Creek (South Fork, Nome)	Med	Lwr	Lwr
Little Rabbit Creek	High	—	High
Little Survival Creek	High	—	Med
Little Susitna River	High	—	High
Little Tutka Bay	Med	—	—
Lookout Cove	Med	—	—

Lost and Found Lake	—	—	—
Lower Fire Lake	Lwr	Med	Lwr
Lower Talarik	Med	Med	Med
Lucille Creek	—	—	—
Lutak Inlet	Med	—	—
Mallard Bay	Med	—	—
Margaret Bay	Med	—	—
Margaret Creek	Med	Lwr	Med
Mariner Creek	Med	Lwr	—
Matanuska River	High	—	Med
McClure Bay	—	—	Med
McKinley Lake	Med	Med	Lwr
McKinzie Inlet	Med	—	Lwr
McNeil Creek	Lwr	Med	Med
McRoberts Creek	Med	—	Med
Meadow Creek	High	High	Med
Meadow Lake	Lwr	Med	—
Memory Lake	Med	Med	Med
Mendenhall River	High	—	Med
Mills Creek	Med	Lwr	Lwr
Minook Creek	Med	—	Lwr
Mirror Lake	Lwr	Med	Lwr
Mission Lake	Med	—	Med
Montana Creek (Juneau)	High	—	Med

Montana Creek (Talkeetna)	—	—	High
Moose Creek	Med	Med	Med
Moose River	Med	Med	Med
Mosquito Lake	High	Med	High
Mud Bay (Homer)	Med	—	—
Mulchatna River	Med	—	Lwr
Nahodka Creek	Lwr	High	—
Naknek River	—	—	Lwr
Nakwasina River	High	—	High
Nancy Lake	High	Med	High
Nataga Creek	Med	Lwr	Med
Nearshore Beaufort Lagoon	—	—	—
Neptune Bay	Med	—	—
Nilumat Creek	Med	Lwr	Lwr
Ninilchik River	High	—	Med
Nome River	Med	—	High
North Twin Lakes	Med	Lwr	Lwr
Noyes Slough	High	High	High
Nushagak River	High	—	Med
One Mile Creek	High	Med	High
Ophir Creek	—	Med	Med
Orca Inlet	Med	Med	Med
Packers Creek	—	—	—
Palmer Creek (Homer)	Lwr	Med	Lwr

Passage Canal (Whittier Harbor)	—	—	Lwr
Pavlof River	Lwr	—	Lwr
Paxson Lake	—	Med	Lwr
Pederson Hill Creek	High	—	—
Peters Creek	Lwr	—	Med
Peterson Bay	High	—	Med
Peterson Creek	High	Med	High
Pile-Driver Slough	—	—	Lwr
Point Macartney	Med	—	—
Popof Strait	High	—	—
Port Clarence	Med	—	Lwr
Port Valdez	Med	Med	—
Port Valdez Small Boat Harbor	Med	Lwr	—
Potato Patch Lake	Med	—	Med
Potter Creek	Med	Med	Med
Power Creek	—	—	—
Pullen Creek	High	—	High
Quartz Creek	—	—	High
Quartz Lake	Lwr	—	Lwr
Rabbit Creek	High	High	Med
Red Devil Creek	Med	Lwr	—
Red Dog Creek	Med	—	—
Red Fox Creek	High	—	—
Red Lake-Anton Road Pond	High	—	—

Resurrection Creek (Hope)	High	—	High
Rice Creek	Lwr	Med	—
Rock Creek	—	—	—
Rogge Creek	Lwr	—	Lwr
Rowan Bay	Med	—	—
Ruby Creek	Med	Lwr	—
Sagavanirktok River	Lwr	Lwr	Med
Saginaw Bay	Med	—	—
Saint John Baptist Bay	Med	—	—
Saint Paul Island Lagoon	High	—	—
Salmon Creek	High	High	Med
Salmon River (Hyder)	—	—	—
Salmon River (Platinum)	—	—	—
Salt Chuck Bay	—	—	—
Salt Lake Bay	Med	—	—
Sawmill Creek (Haines)	High	—	High
Sawmill Creek (Sitka)	—	—	—
Sawmill Creek (Sitka) DUPLICATE/DELETE	—	—	—
Scheffler Creek	—	—	—
Schulze Cove	Med	—	—
Seldovia Bay	High	—	High
Seldovia Bay (Harbor)	Lwr	—	—
Shaw Creek	Med	—	High
Ship Creek-Glenn Hy. Bridge Down to Mouth	High	—	High

Shoal Cove	Med	—	—
Shoal Creek	Med	Lwr	Med
Shoemaker Bay	Med	—	Med
Shovel Creek	Med	Lwr	Med
Silver Bay	High	—	—
Sinuk River	Med	Lwr	Med
Sitka Harbor	High	—	Med
Sitka Sound	—	—	—
Situk River	High	—	Lwr
Skagway Harbor	—	—	—
Skagway River	Med	Med	High
Slate Creek	Med	Lwr	—
Sleepy Bay	—	—	Med
Slikok Creek	Med	—	High
Snake River	Med	Med	Med
Soldotna Creek	Lwr	—	Lwr
Solomon River	Med	Med	Med
Solomon River, East Fork	Med	Lwr	High
South Twin Lakes	Med	—	—
South Unalaska Bay	High	—	Med
Spring Creek (Palmer)	Med	—	—
Spring Creek (Seward)	—	—	—
Stariski Creek	High	—	High
Starrigavan Creek	—	—	—

Steep Creek	—	—	—
Sundi Lake	Lwr	Med	Med
Sunshine Cove	Med	—	—
Sunshine Creek	Med	—	Lwr
Suqitughneq River	Lwr	Lwr	Lwr
Susitna River	High	Lwr	Med
Sweeper Cove	Med	—	Med
Sweeper Creek	Med	Lwr	High
Taku River	—	—	Med
Talkeetna River	High	—	Med
Tanana River	—	—	—
Thorne Bay	High	—	—
Thorne River Estuary	—	—	Med
Tisuk River	Med	Lwr	Med
Tolstoi Bay	Med	—	—
Tongass Narrows	High	—	—
Town (Trout) Lake	—	Med	Lwr
Troutman Lake	Lwr	Lwr	—
Tubutulik River	—	—	—
Turnaround Creek	Med	Lwr	Med
Tuxedni Bay	Med	—	—
Twelvemile Arm	Med	—	—
Twitter Creek	Med	—	—
Two Moon Bay	Med	—	—

Udagak Bay	Lwr	—	—
Unalaska Lake	Med	High	Med
University Lake	High	—	—
Unnamed Creek (Chignik)	—	—	—
Unnamed Creek (Chuitna River tributary)	—	—	—
Unnamed Creek (City of Kenai)	Med	—	—
Unnamed Creek (Petersburg)	—	—	—
Unnamed Lake (Chena Hot Springs Rd.) Two Rvr Lodge	Lwr	Lwr	—
Unnamed Stream (Old Harbor)	—	—	—
Upper Bonnie Lake	Med	—	—
Upper Fire Lake	Lwr	Med	Lwr
Upper Talarik Creek	Med	Lwr	High
Vanderbilt Creek	High	—	Med
Walby Lake	Lwr	Med	Med
Ward Cove	High	—	—
Wasilla Creek	High	—	High
Wasilla Lake	High	—	High
West Port Frederick	Med	—	—
Westchester Lagoon	High	—	Med
Whale Passage	Med	—	Lwr
Whittier Creek	—	Med	Med
Whittier Harbor	—	—	—
Willow Creek	—	—	High
Winter Harbor	Med	—	—

Womens Bay	Med	—	—
Wood River	High	—	Med
Woodard Creek	Med	Med	Med
Wrangell Narrows	Med	—	Lwr
Wrinkleneck Creek-Swan Lake	Med	—	Lwr
Wulik River	High	Med	Med
Yukon River (Galena)	Med	—	—
Zinc Creek	Med	Lwr	Lwr

APPENDIX I Supplemental Listing Methodology

Guidance for Determining Water Quality Impairments from Residues

NOTE: The information in this section does not provide a complete description of the specific considerations for waters impaired by residues; Appendix G, (Alaska's Interpretation of the Residues Criterion with Alaska's Water Quality Standards Regarding Attainment and Impairment Determinations) should be consulted for additional detail that more fully explains the considerations.

A seafood processing or LTF in Alaska is typically issued a ZOD in its permit for the residues discharges. Exceedance of a permitted ZOD is not equivalent to impairment; rather, the impairment standard is exceedance of 1.5 acres of continuous residues coverage.

For Category 5/Section 303(d) listed waters associated with a permitted facility, if the areal extent of continuous cover is not declining in size, DEC initiates permit modification or TMDL development.

Seafood Processing Facilities

A waterbody associated with a seafood processor that has a current ZOD authorization with two or more dive survey reports that document an area of continuous coverage seafood waste larger than 1.5 acres is placed in Category 5. Exceptions are waterbodies for which ZODs were authorized at greater than 1.5 acres and situations in which the facility is subject to an administrative action (such as a Compliance Order or Consent Order by Decree for residues) to ensure attainment of WQS. In the latter instance, the waterbody may be considered for placement in Category 4b. For seafood piles that are legacy sites (and not current dischargers) and that are determined to be more than 1 acre of continuous residue coverage, the affected waterbody may be considered for Category 5 listing. This exception condition occurs because at the time the contributing facility was permitted, a 1-acre impairment standard was in effect and the current 1.5-acre impairment standard had not been adopted.

Log Transfer Facilities

A waterbody associated with an LTF that has a current ZOD authorization is placed in Category 5 if two or more consecutive dive survey reports document more than 1.5 acres of continuous residues coverage and the residue coverage is greater than 10-cm in thickness at any one point, unless DEC has approved a remediation plan for that waterbody. A waterbody associated with an LTF is placed in Category 5 when an LTF permittee has failed to implement an approved remediation plan according to its schedule. Exceptions are waterbodies for which ZODs were authorized at greater than 1.5 acre, which are considered on a case-by-case basis.

If DEC approves a remediation plan on a Category 5 listed waterbody that is reporting more than 1.5 acres of continuous coverage of bark on the bottom before preparation of the next Section 303(d)

list, the waterbody is placed in Category 4(b). Moving a Category 5 water to Category 4b requires EPA approval.

A waterbody associated with a facility operating under either of the GPs applicable to LTFs for which continuous coverage of residues over 1.5 acres are being reported is considered for a Category 5 listing if one of the following conditions is met: (1) the permittee failed to submit a remediation plan, or (2) a remediation plan has been submitted, but the permittee is failing to implement or is not meeting milestones set forth in the approved remediation plan.

A waterbody associated with an LTF for which no currently permitted or active discharge to the water is occurring, but for which the last known dive survey reported more than 1.5 acres of continuous residues coverage on the marine seafloor, is placed on the Category5 list.

Removal of Waterbodies Determined to be Impaired from Residues from the Category 5 List

The following protocols are applied to all waterbodies associated with a permitted facility and Category 5 listing for residues, regardless of whether an active discharge is occurring on site.

- In addition to consideration of the continuous residues coverage standard of 1.5 acres, DEC may consider biological assessment information, such as sediment profile imaging, in a determination to remove a water on the Category 5 list for residues.
- For waterbodies placed on the Category 5 list after 1998 and determined to be impaired for residues based on the results of two or more dive surveys:
    - DEC requires two consecutive dive surveys documenting that continuous residues coverage is no more than 1.5 acres before the waterbody is eligible for removal from the Category 5 list and for placement in Category 1 or 2.
- For waterbodies placed on the Category 5 list in 1998 or earlier (based on 1.0 acre) and determined to be impaired for residues based on the results of one dive survey or best professional judgment:
    - DEC requires one dive survey documenting that continuous residues coverage is no more than 1.0 acre before the waterbody is eligible for removal from the Category 5 list and placement in Category 1 or 2.

Guidance for Determining Water Quality Impairments from Turbidity

This listing and assessment methodology for the turbidity pollutant is not a change to the turbidity criterion within Alaska WQS; however, it does provide direction for implementing the criterion when making water quality attainment or impairment determinations.

Parameter-Specific Criteria

The methodology used by Alaska to evaluate waterbodies for the turbidity criterion specified in 18 AAC 70.020(b)(12) and (24) is described below.

Identification of Natural Conditions

When considering data in an impairment decision, the natural background condition, or reference condition, must be established. This first step is essential because the term "above natural conditions" is key to the criteria specified for five of the seven water uses protected from turbidity. Turbidity data collected without an established natural condition should not be considered in any impairment determination. Many of Alaska's waters have naturally occurring turbid flows, especially glacially fed or tidally influenced waters, and care must be taken to effectively establish a natural condition for reference.

Alaska recognizes that variability in turbidity—among sites and over time—complicates the task of determining a natural or background level for any specified level of discharge.

To collect water samples, a concurrent or an "upstream, downstream" approach is preferred. This approach entails sampling to establish natural conditions. Measurements taken upstream (control/natural conditions) and downstream (treated/impacted) of a particular pollutant source are compared. It is assumed that any increase in turbidity is due to the source or activity. Because upstream sampling establishes the natural conditions, readings should be taken upstream of any suspected exceedances of the criteria and of any man-induced point or nonpoint sources of turbidity.

When it may not be feasible to establish an upstream reference condition, a "paired watershed" approach may be used. In this approach, a nearby water with similar hydrology, morphology, aspect, and other characteristics is identified for use in establishing the natural condition. The upstream, downstream approach is the preferred method, and data using this method may be weighted greater than data gathered through a paired watershed approach.

Samples taken to establish reference conditions must collected at approximately the same time of year and during the same flows, as when samples are collected for suspected exceedances.

Because turbidity can be influenced by natural phenomena, such as storm events, sampling during or immediately after high-flow or storm events should be avoided. Low-flow, dry-period sampling also should be avoided. Any turbidity data taken during such events should be discounted. Such data would not be considered less reliable if exceedances and impairment are suspected to be persistently occurring at low-flow or high-flow storm events and to be a result of man-induced activities. For these instances, the preferred approach is to gather data at a wide range of flow events.

Visual Turbidity Observations

Although visual observations of elevated turbidity observations may often be noted and signal criteria exceedances, Alaska does not make impairment determinations, and the associated Section 303(d) listings, based solely on visual turbidity observations. Visual observations often lead to identification of suspected criteria exceedances. To confirm exceedances, the results of in-water nephelometric turbidity unit (NTU) sampling are compared to an established reference condition.

Minimum Data Requirements and Analysis

Current data (less than 5 years old) are generally used for evaluation of turbidity, although some documentation or data more than 5 years old may be relevant. Older data are generally given less significance when reviewing information in an impairment determination.

Collection of 20 or more samples during at least three sampling events, with each sampling event separated by at least 1 week, is required to establish persistent exceedances of the turbidity criterion. Larger sample sets are desirable.

Sample locations should be reasonably distributed to avoid bias in any one sampling event. Sampling is generally obtained for at least two seasons. For example, 20 samples could be collected during the first and third weeks of May and the first week of June to make a determination.

If more than 10% of the samples exceed the turbidity criteria, the waterbody is considered for assignment to Category 5. Outliers, or results that are numerically distant from other data, are fully scrutinized, and in certain instances, such as in a clear storm event situation, they may be discounted. Outliers are viewed in "totality" of the entire data set. An impairment determination is not based on outliers alone.

The preferred method for establishing turbidity impairment is to employ the use of continuous sampling data loggers, which are capable of recording large data sets. In these instances, statistical analysis may be required.

Before a final decision to add a waterbody impaired by turbidity to the Section 303(d) list, Alaska reviews the data for the basic concepts employed in any listing, including persistence, duration, and magnitude. Tools such as enforcement and permit limitations should be evaluated for the ability to effectively reduce the exceedances.

Removal of a Water from the Section 303(d) List for Turbidity

The current listing methodology used by Alaska dictates that for removal of a water from the Section 303(d) list, both the level of data to support the removal determination and the burden of proof are no greater than those used in the initial Section 303(d) listing determination. For a water that was placed on the Section 303(d) list (in 2008 or earlier) for turbidity impairment based on visual turbidity observations and best professional judgment, a determination to remove the water from the Section 303(d) list may be based on visual turbidity observations and best professional judgment alone.

Guidance for Determining Water Quality Attainment or Impairment from Pathogens

Test methods for pathogens are specified in 18 AAC 70. The fecal coliform (FC) bacteria and enterococci enumeration must be determined by the membrane filter technique or most probable number procedure, according to the approved editions of *Standard Methods for the Examination of Water and Wastewater*, adopted by reference in 18 AAC 70.020(c), or in accordance with other standards approved by DEC and EPA.

Section 303(d) listing determinations must be based on a laboratory analysis with an adequate Quality Assurance Project Plan (QAPP) for any FC or enterococci samples. For non-detect samples, the laboratory minimum detection limits are used to determine the value for a geometric mean calculation.

It should be established that the FC bacteria levels are from human activities (such as septic systems, domestic animal waste) prior to any consideration of Section 303(d) listing as impaired. A waterbody is not Section 303(d) listed as impaired if it can be established that the exceedance is due to natural conditions (such as wildlife). A determination about natural conditions requires well-reasoned best professional judgment combined with information or data to validate the condition. A decision to not list a waterbody because exceedances are from natural conditions requires, at a minimum, identification of a natural source that is likely responsible for producing the exceedances and information to support the absence of human impacts or no human impacts that exceed the allowable limits. Wilderness areas or other areas with no significant human impact are assumed to represent natural conditions.

Guidance for Determining Water Quality Impairments from Pathogens for *Fresh Water Uses*

The numeric criteria for six fresh water uses specified in Alaska WQS for FC bacteria (18 AAC 70.020) all have an "in a 30-day period" geometric mean provision and a "not more than 10% of the samples may exceed" provision. Both provisions in the criteria must be met to attain the FC bacteria standard. (No criterion is specified for the "Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife" fresh water use.)

Minimum Number of Samples

For either the 30-day "geometric mean" or the "10% of samples" provisions of the criteria, a minimum of 5 samples is required for determining attainment or impairment however 10 samples are preferred. Data sets for 30 days with fewer than 10 samples are less desirable for the purposes of making a determination of WQS attainment.

Assessment and Sampling Period

At least two 30-day sampling periods during a 2-year period is desired to make attainment or impairment decisions. 10 samples in each 30-day sampling period are considered collectively to be an adequate assessment and sampling period. In each 30-day sampling period, the grouping or overlapping of samples should be avoided, and sampling preferably should be spread over the 30-day period. Data

sets that do not have two distinct 30-day sampling periods within a 2-year period are considered insufficient for listing and delisting purposes.

Two or more samples may be taken on the same day but should not be taken at the same sampling point. A period of sampling may be established for an impairment when exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both.

Sampling during a range of stream flows, if applicable, is a better representation of all conditions and can identify seasonal conditions that are problematic for FC, such as ice break-up in the spring. Sampling during peak flow events, such as spring break-up or large rain events, is not desirable because it may not represent a persistent human-caused impact. If it is deemed necessary to sample during peak flow events or spring break-up, the sample data set must contain samples collected during a range of stream flow conditions and results should be compared to other flows for comparison.

Approach for Determining Attainment or Impairment Caused by Fecal Coliform Bacteria for Fresh Water Uses

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the criterion over a two year period. Samples collected in two or more 30-day sampling periods are not combined; they are examined separately for comparison with the standard.

The recommended approach is that exceedances found in only one 30-day sampling be followed with an additional 30-day sampling period during the same season of the next year to validate the persistence of the water quality impairment over a two year period.

Guidance for Determining Water Quality Attainment or Impairment from Pathogens for *Marine Water Uses*

FC bacteria criteria are specified for six of the seven marine water uses. The numeric criteria for five uses specified in 18 AAC 70.020(b) for FC bacteria all have provisions for "in a 30-day period" and a "not more than 10% of the samples may exceed." Both provisions must be met to attain the FC bacteria standard. (No criterion is specified for the marine water use for "Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife" marine water use.)

An FC bacteria criterion specified for the "Harvesting for Consumption Raw Mollusks or Other Aquatic Life" marine water use is different from the other five marine water uses. In addition, EPA has established additional criteria for enterococci for Alaska for the primary contact recreation use in marine waters. These criteria are discussed below.

Minimum Number of Samples

For either the 30-day "geometric mean" or the "10% of samples" provisions of the criteria, a minimum of 5 samples is required for determining attainment or impairment however 10 samples are preferred in a recommended 30-day period. Data sets for 30 days with fewer than 10 samples are less desirable for the purposes of making a determination of WQS attainment or impairment.

Assessment and Sampling Period

At least two 30-day sampling periods during a 2-year period is desired. As noted earlier, 10 samples in each 30-day sampling period are considered collectively to be an adequate assessment and sampling period. In each 30-day sampling period, the grouping or overlapping of samples should be avoided, and sampling preferably should be spread over the 30-day period. Data sets that do not have two distinct 30-day sampling periods within a 2-year period are considered insufficient for listing and delisting purposes.

Two or more samples may be taken on the same day but should not be taken at the same sampling point. A period of sampling may be established for an impairment when exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both.

Approach for Determining Attainment or Impairment Caused by Fecal Coliform Bacteria for Marine Water Uses

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the standard over a two year period. Samples collected in two or more 30-day sampling periods are not combined; they are examined separately for comparison with the standard.

Criterion for the "Harvesting for Consumption of Raw Mollusks or Other Aquatic Life" Marine Water Use

The Alaska water quality standard criterion for the "Harvesting for Consumption Raw Mollusks or Other Aquatic Life" marine water use is worded as follows:[3]

> Based on a 5-tube decimal dilution test, the fecal coliform median MPN may not exceed 14 FC/100 ml, and not more than 10% of the samples may exceed a fecal coliform median MPN of 43 FC/100 ml. Or based on a 12-tube single dilution test, the fecal coliform median MPN may not exceed 14 FC/100ml, and not more than 10% of the samples may exceed a fecal coliform median MPN of 28 FC/100 ml.

Minimum Number of Samples

A minimum of 15 samples should be collected for assessing attainment of the "Harvesting for Consumption Raw Mollusks or Other Aquatic Life" use in remote areas where there is no actual or potential pollution. The collection of the water samples should generally be planned or scheduled to capture the rainy months and the dry months, as well as high- and low-tide variables. Ideally the samples capture various hydrological and meteorological conditions that might have an impact on the water quality. In addition to the water sampling, a shoreline survey is required to determine potential pollution sources on shore. A typical water classification survey for the classification of commercial shellfish growing and harvest areas takes at least 12 months. A minimum of 30 samples should be collected under

[3] The abbreviations in the regulatory language are defined as follows: MPN, most probable number; FC, fecal coliform; and ml, milliliters.

various environmental conditions in growing areas where pollution sources (human habitation or known pollution potential) may have an impact on the water quality.

Approach for Determining Impairment

A waterbody is considered to not be attaining the FC bacteria standard when either provision of the standard is exceeded for the "Harvesting for Consumption Raw Mollusks or Other Aquatic Life" marine water use.

Criteria for Marine Water Use for Coastal Recreation Areas (Primary Contact)

The federal Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 specifies the following water quality criteria for coastal recreation (primary contact) in marine waters:

> Geometric mean of 35 enterococci per 100 ml shall not be exceeded.
>
> Or
>
> A single sample maximum (per 100 ml) of 158 enterococci shall not be exceeded.

This standard was promulgated by EPA for Alaska in 2004 and published in the *Federal Register* in 69 FR 67217-67243.

Minimum Number of Samples Required for Attainment or Impairment for Coastal Recreation Areas

At least two 30-day sampling periods during a 2-year period, with a minimum of five samples in each 30-day sampling period, are necessary to provide an adequate assessment and sampling period for coastal recreation (primary contact) areas in marine waters. In the 30-day period, samples should not be grouped; instead, they should be reasonably spread over the 30-day sampling period. However, two samples in one day are acceptable but should not be taken at the same sampling point. When exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both, a seasonal period may be established for the impairment.

Laboratory Methodology for Enterococci

The standard method (EPA Method 1600) for enterococci analysis must utilize the mEl medium or other method approved by EPA for CWA purposes.

Approach for Determining Impairment for the Marine Water Coastal Recreation (Primary Contact) Use Areas

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the criterion. Samples collected in two or more 30-day sampling periods are not combined; instead, they are examined separately for comparison with the standard.

The recommended approach is that exceedances found in only one 30-day sampling be followed with an additional 30-day sampling period during the same season of the next year to validate the persistence of the water quality impairment over a two year period.