ALASKA's 1996

WATER QUALITY ASSESSMENT REPORT

CLEAN WATER ACT
SECTION 305(b) AND SECTION 303(d) SUBMITTAL
TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY

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I. OVERVIEW

Purpose of the Report

Section 305(b) of the Clean Water Act (CWA) requires that states prepare and submit every two years a water quality summary report to the U.S. Environmental Protection Agency (EPA). EPA provides guidance to states for the consistency and utility of reported water quality information. Each state responds based on available resources and the degree of available water quality information. EPA then forwards the states' water quality reports to the U.S. Congress, which uses this information to make statutory and funding adjustments to national water quality programs. In addition, CWA Section 303(d) requires states to submit to EPA lists of waterbodies that meet 303(d) listing criteria. This document satisfies Alaska's responsibility for both Sections 305(b) and 303(d) reporting requirements for 1996. The Section 303(d) water quality-limited waterbody list is included as an appendix to this report.

Section 303(d) of the CWA requires identification of surface waterbodies that are water quality-limited by point and/or nonpoint sources of pollution which may require additional controls to meet state water quality standards. These waterbodies are prioritized based on the severity of the pollution and other factors. Alaska's 1996 Section 303(d) list and prioritization schedule are included in Appendix A.

The 303(d) list and prioritization schedule are divided into two tiers. Tier I includes water quality-limited waterbodies which require a comprehensive assessment to verify the extent of pollution and what controls are in place or needed. Tier II represents water quality-limited waterbodies with complete assessments, which now require a waterbody recovery plan to meet water quality standards. A matrix with specific information on each 303(d) designated waterbody, including corresponding pollutant parameters, is also included in Appendix A.

Additional water quality-limited waterbodies which have recovery plan implementation are <u>not</u> Section 303(d) designated and are included in Tier III. The Tier III waterbody list and corresponding matrix is included in Appendix B. Tier III waterbodies are tracked and monitored by the Alaska Department of Environmental Conservation (ADEC) to help ensure complete waterbody recovery.

Tier IV evaluated waterbodies are <u>not</u> water quality-limited and do not require any further action at this time. These waterbodies are listed in Appendix C with a matrix that explains the current status of each waterbody.

The draft 1996 Water Quality Assessment Report was released for agency and public comment by the ADEC between February 1 and March 1, 1996.

This final report and the associated Section 303(d) waterbody list are used by the state for determining water quality trends, identifying priority water pollution problems, and preparing strategies to address water quality issues. All parties with responsibility for land use management or water quality monitoring are beneficiaries of this information. This report also identifies activities and sources of pollution that affect water quality, and provides general information to the public on the various water quality programs in Alaska.

Water Resources Summary

Alaska has a tremendous amount and diversity of water resources. For the purpose of developing this report, "waters of the state" include coastal marine waters within three miles from shore, streams, rivers, ponds, lakes, estuaries, ground waters, and wetlands. Alaska's water resources include an estimated 3 million lakes greater than five acres, 365,000 miles of rivers and streams, at least 170 million acres of wetlands, and 36,000 miles of marine water shoreline. All of the state's waters are organized into 136 distinct U. S. Geological Survey (USGS) hydrologic cataloging units that each include numerous watersheds.

Water Quality in General

The vast majority of Alaska's watersheds, while not being monitored, are presumed to be in relatively pristine condition due to Alaska's size, sparse population, and general remoteness. However, Alaska has localized water pollution. Surface water quality has been found to be impaired or threatened from sources such as urban runoff (Fairbanks, Anchorage, and Juneau); mining operations in the Interior and Northwest Alaska; seafood processing facilities in the Aleutian Islands; and forest products facilities in Southeast Alaska.

Ground water impairment has been documented in various areas of the state, and has been linked predominantly to above ground and subsurface petroleum storage facilities, as well as operational and abandoned military installations. Other sources, such as failed septic systems, also contribute to ground water contamination.

Alaska's Approach to Water Pollution Problems

ADEC has developed the Watershed Management Section, within the Division of Air and Water Quality, to implement the watershed protection approach that has been used successfully in other states. The purpose of this approach is to cost-effectively improve the water quality of Alaska's

polluted waterbodies and to protect its healthy watersheds in cooperation with other agencies, industry, interest groups, and the public.

The process to be used to advance the watershed protection approach in Alaska is outlined in the statewide **Watershed Management Framework**. The framework document is scheduled for completion by June 1997. Key elements of the watershed approach that will be incorporated in the framework document include:

- involve stakeholders from the "grassroots" level up through the agencies
- identify watershed management units
- identify priority watersheds
- develop watershed goals
- determine water quality monitoring needs
- target resources in priority watersheds
- determine watershed protection effectiveness

ADEC also supports numerous additional water quality projects and programs statewide. The following programs are among many at ADEC designed to protect and restore water quality: pollution prevention; leaking underground storage tanks; contaminated sites; industrial permitting; waterbody assessments and recovery plans; water quality monitoring; water quality technical services; and public outreach and education from statewide public service offices.

II. POLLUTANT SOURCES AFFECTING WATER QUALITY

Urban Development

While the majority of the state's waters are remote and presumed to be in pristine condition, Alaska has water quality and other environmental problems typically associated with urban development. The state's population is approximately 604,000, with 60 percent of the population residing in the three largest cities--Municipality of Anchorage (251,335), Fairbanks North Star Borough (83,374), and the City and Borough of Juneau (29,378). There are five cities with a population between 5,000 and 10,000; 31 between 1,000 and 5,000; and 285 villages with a population of less than 1,000 each (Alaska Department of Labor, 1996).

Urban development can adversely affect the water quality of local lakes, ponds, streams, estuaries, harbors, wetlands and ground waters. Sources of pollution include on-site sewage disposal, domestic animal wastes, hazardous or toxic substances, leaked petroleum products,

landfills, nutrient introduction, stormwater runoff, erosion and sedimentation of disturbed surfaces, modification of shores, and loss of wetlands. Harbors and marinas are a chronic source of diffuse pollutants, and water quality can be visibly affected. Marine sources include raw sewage, fuel spills, domestic products, bilge water, deck washwater, fish wastes, bottom paints, and underwater outboard motor exhausts. Pollution of urban waters can be a threat to public health and the environment, as well as a public nuisance and an aesthetic detriment. It is difficult and expensive to restore waters that were once of high quality after they have been degraded.

Seafood Processing

Seafood processing in Alaska is conducted in a number of locations under a variety of conditions. In general, seafood processors are separated into onshore facilities and offshore floating operations. Floating operations are further divided into shore-based facilities that are permanently moored near shore, near shore facilities that operate temporarily in protected areas, and mobile processors operating solely in deep water.

Seafood processing facilities use a variety of techniques and equipment to produce seafood products. The material typically remaining after processing (i.e., heads, skin, scales, viscera, tail fins, and shells) is often ground and discharged as a solid and liquid waste effluent. Some processing operations have replaced grind and discharge techniques with screening devices that have significantly reduced the discharge of seafood wastes. Additionally, solid waste material may be directly rendered into fishmeal at meal processing facilities and wastewater is sometimes partially recycled to recover solids for fishmeal production. ADEC recognizes that many major seafood companies have invested millions of dollars in processing changes and additional pollution control technology to reduce the environmental impacts of their operations.

Water quality impacts resulting from effluent discharge can be divided into two categories: 1) the accumulation of seafood waste solids on the ocean floor; and 2) seafood processing effluent that remains suspended in the water column.

The accumulation of seafood waste solids (also known as wastepiles) on the ocean floor adjacent to processing facilities is characteristic of many shore-based operations. Dive surveys or bottom sampling are used to determine the extent of the wastepiles. Wastepiles can smother aquatic life on the ocean floor and may contribute to reduced oxygen levels of the surrounding waters because of the organic decomposition of the wastepile. Decomposition of the wastepile creates increases in the biochemical oxygen demand on the available oxygen in the water column. If oxygen levels are reduced in the water column the oxygen deficit that is created may cause stress

or death to aquatic life. In recent years, many seafood processors have dramatically reduced the amount of waste solids being discharged to the point that the solids are no longer accumulating on the ocean floor.

Seafood processing effluent that remains suspended in the water column, often referred to as "stickwater," is generally more of a contributing factor to reductions of oxygen in the water column than the effect of wastepiles on the ocean floor. This is because a large portion of the discharged organic material remains suspended in the water column (as opposed to being deposited on the ocean floor), and due to the small particle size of the discharged material, provides a greater surface area and increased biochemical oxygen demand.

Seafood processing facilities are considered to be point sources of discharge and are thus subject to Section 402 requirements of the Clean Water Act. Section 402 allows EPA to issue National Pollutant Discharge Elimination System (NPDES) general or individual permits to seafood processing operators that are certified by ADEC for compliance with state water quality standards.

Section 403 of the Clean Water Act requires NPDES permits for marine discharges to be issued in compliance with EPA's ocean discharge criteria for preventing unreasonable degradation of marine waters.

As of June 1994, there were 388 facilities operating in Alaska that were permitted to discharge seafood processing effluent under the NPDES program. Of these operators, 136 were shore-based and 252 were floating processors. Fifty-three (53) of these facilities have been issued individual NPDES permits because: 1) facilities are located in one of several areas excluded from the general NPDES permit area (e.g., Akutan, Kodiak, and Unalaska/Dutch Harbor); 2) processing wastes are discharged into shallow waters with poor flushing; or 3) facilities are located within one-half mile of areas of special concern.

Oil & Gas Development/Transportation

Oil and gas development is an important economic activity in Alaska. While older oil and gas fields around Cook Inlet in Southcentral Alaska continue to be important sources of energy, most of Alaska's oil comes from the North Slope and adjacent off-shore areas. Waterbodies potentially affected by oil and gas activities include North Slope rivers, streams, lakes, wetlands, and estuaries; the Beaufort Sea; Kenai Peninsula area waters; and Cook Inlet. The transportation of oil poses risks to coastal areas such as Prince William Sound.

Oil and gas production activities can affect water quality from both point and nonpoint sources. Common point sources include shore-based refineries, ballast water facilities and offshore platforms. Nonpoint sources include road impoundments, spills, culvert washouts and drainage alterations, pad runoff, reserve pit leachates, offshore causeways, gravel mining, and pipelines.

An estimated 9,160 acres of North Slope tundra wetlands have been developed for petroleum operations, and the Trans-Alaska Pipeline System and Dalton Highway account for about 20,150 acres of wetlands fill.

Placement of fill material into wetlands (roads, gravel pads, and reserve pits) also constitutes nonpoint source pollution in the form of leachate and runoff. Wetlands fill is regulated through Section 404 of the Clean Water Act to avoid and minimize water quality impairment through federal and state mitigation policies.

The 1989 Exxon Valdez oil tanker spill caused extensive environmental damage in Prince William Sound and surrounding areas. The Auke Bay Laboratory of the National Marine Fisheries Service (Department of Commerce) is currently undertaking a major biological and chemical assessment of the Prince William Sound area to determine changes from early 1970s "baseline conditions" compared to before and after Exxon Valdez oil spill conditions.

Mining

Mining activities in Alaska involve a range of minerals and metals extraction, including gold, silver, zinc, lead, platinum, molybdenum, coal, building stone, and sand and gravel. Historically, gold has been Alaska's most valuable mineral commodity. In addition to hard rock gold and silver mining, placer gold production is common in the Interior. Alaska has the largest placer mining industry in North America.

Hardrock and placer mining can affect water quality, resulting in pollution from both point and nonpoint sources. The discharge of collected mine drainage and processing wastewater is considered to be a point source, and requires a state certified NPDES permit if the discharge is to surface waters. Nonpoint sources usually result in the production of sediment and turbidity, and can occur from the erosion of active and abandoned mine sites from stream flow or high water flow; modification and diversion of stream channels; erosion and runoff from upland disturbed surfaces; overburden and tailings; and erosion and runoff from associated activities such as roads and camps.

Mining sediment can restrict light penetration and plant productivity; cover aquatic habitat,

spawning gravel, and food sources; reduce fish egg and fry survival; restrict fish feeding and movement; interfere with feeding by birds and wildlife; and carry absorbed toxic heavy metals. Sedimentation may also affect human uses such as drinking water sources, subsistence uses, and recreation.

Certain hardrock mine sites may produce contamination of waters from mineral deposits such as iron, manganese, cadmium, mercury, copper, and arsenic. Leaching of minerals can be increased by the exposure of ore deposits during mining. Arsenic is commonly associated with placer gold deposits and in some cases naturally occurs in elevated levels in streams. Cyanide and mercury used in association with gold mining processes also present potential water quality concerns.

Forest Products

Commercial timber harvesting occurs throughout the state, but is most prevalent in Southeast Alaska on federal, state and private lands. Timber harvest in the Interior is relatively minor when compared to the coastal regions, but is expected to increase substantially in the near future, particularly within the Tanana State Forest.

There are three activities associated with Alaska's forest products industry that have contributed to water quality impacts and concerns:

1) forest products industrial facilities at Ward Cove (Ketchikan), Silver Bay (Sitka), and Shoemaker Bay (Wrangell);
2) log transfer facilities; and
3) timber harvest and road construction activities.

Forest Products Industrial Facilities

The largest forest products facilities in Alaska have been operated at Ward Cove near Ketchikan by the Ketchikan Pulp Company (KPC), at Silver Bay near Sitka by the Alaska Pulp Corporation (APC), and at Shoemaker Bay near Wrangell by APC. The KPC facility at Ward Cove includes a pulp manufacturing component and a sawmill operation. The APC facility at Silver Bay was a pulp manufacturing facility that ceased operations in 1993. The APC facility in Wrangell was a sawmill facility that ceased operations in 1994. Ward Cove pollutant parameters of concern are sediment, dissolved oxygen, color, and toxic substances. Silver Bay pollutant parameters are dioxin, sludge and dissolved oxygen. Shoemaker Bay has marine intertidal habitat degradation primarily from log bark debris that has affected aquatic life in the waterbody.

Log Transfer Facilities

Forest products in Alaska are typically handled through marine log transfer facilities commonly

referred to as LTFs. LTFs are frequently located in estuaries and are an important water quality concern in the coastal forested regions of Southeast Alaska and Prince William Sound. Throughout these forested areas, logs are trucked to the shoreline where they are stored, sorted, bundled, transferred to marine waters, and assembled into rafts, or placed on barges for transport by tugboats to mills or shipping points.

Log rafting at LTF facilities often causes bark to accumulate on the ocean floor. The findings of a joint study by ADEC and the National Marine Fisheries Service showed that accumulation of bark is highly variable, depending on the volume of timber transferred, log entry method and velocity, and marine physical conditions. Volume of timber transferred is the most important variable.

LTFs are regulated as point source pollution discharges. Since 1985, approximately fifty (50) LTFs have been regulated through federal NPDES permits. LTFs also receive Corp of Engineers Section 404 permits for dredge and fill activities.

The impacts of LTFs can include damage to intertidal areas from log bundles waiting to be rafted, smothering of bottom habitat with bark, lowering of dissolved oxygen from bark decomposition, leaching of organic compounds from the bark, and production of hydrogen sulfide and ammonia. While the effects are highly variable, depending on site location and conditions, bark accumulation on the ocean floor can alter benthic communities.

Timber Harvest and Road Construction Activities

The effects of timber harvesting on water quality in Alaska are associated primarily with sedimentation and the introduction and/or loss of vegetative debris. These variables may have implications for fresh water fish habitat and are discussed separately below.

Sedimentation

Sedimentation occurs naturally in Southeast Alaska primarily through landslides induced by heavy rainfall on steep slopes with unstable soils. These same physical conditions, while highly variable from site to site, may increase sedimentation in areas where timber harvest occurs.

The amount of sediment entering streams from timber harvest is highly variable, depending on the nature of the sources, the type and extent of harvest activity, amount of rainfall, and effectiveness of forest management practices.

The adverse effects of excessive sediment on aquatic habitat and fish are well documented. Fine

sediment can cover streambeds and fill interstitial gravel spaces, reduce interstitial dissolved oxygen, impede egg development, reduce fry size, impede fry emergence, cover and hide food sources, reduce plant and invertebrate productivity, slow the growth rates of fish, abrade the gills of fish, and cause avoidance of affected waters. High levels of sediment can reduce the size of pools, disrupt spawning areas, and cause hydrologic changes. Debris torrents from landslides can cause scouring of stream substrates and destruction of habitat. Erosion of stream banks with overhanging root masses also removes critical habitat.

In recent years the forest products industry has made significant progress in minimizing sedimentation through the application of best management practices (BMPs) required under the Alaska Forest Resources and Practices Act and regulations. Examples of timber harvest and road construction BMPs designed to protect anadromous fishery habitat that are applied to all land ownerships include riparian buffer strips, protection of unstable areas, road erosion control, and better bridge and culvert design.

Vegetative Debris

Timber harvesting can also introduce vegetative debris into streams. State and federal BMPs dictate cleaning introduced debris from channels, but leaving naturally-occurring large woody debris (LWD). LWD (tree boles and large limbs) is an essential component in determining stream morphology, stabilizing channels, and providing important fish habitat. A key concern is that harvest of streamside trees prevents or reduces future accumulation of woody debris in the stream. Without consistent replenishment, the loss of instream woody debris through decay and/or flushing can result in decreased retention and sorting of substrate materials and the loss of pool habitat.

Agriculture

All previous water quality assessment information to date has found that agricultural activities, individually or cumulatively, have not caused significant adverse impacts to the waters of Alaska. In addition, erosion and sedimentation from croplands is not expected to cause significant water quality impacts. There are no documented examples of sedimentation from agricultural lands causing surface or groundwater impairment. Application of fertilizers and pesticides are considered to be minimal. No impact to water quality has been documented from confined animal facilities.

Exxon Valdez Oil Spill

On March 24, 1989 the Exxon Valdez oil tanker spilled approximately 11 million gallons of crude oil into the waters of Prince William Sound and adjacent beaches causing immediate and

extensive environmental degradation.

There are nineteen beach areas identified by ADEC as still having shoreline impacts as a result of the spill. Waterbodies adjacent to these oiled beaches have adverse effects to designated uses and are being restored through efforts of the Exxon Valdez Trustee Council (EVTC). ADEC has determined that the EVTC restoration plan and associated projects represent the most appropriate method by which the affected waterbodies and adjacent shorelines will be allowed to return to pre-spill conditions.

Under the terms of the December 1991 Exxon Valdez Settlement approved by the U.S. District Court, Exxon paid $125 million in criminal liability and will pay a total of $900 million from 1992 to 2001 to state and federal agencies to settle damages to publicly-owned resources affected by the oil spill. On an annual basis, the Exxon Valdez Oil Spill Trustee Council decides how the settlement money is spent. In November 1994, the Trustee Council adopted the Exxon Valdez Restoration Plan which contains policies for making restoration decisions and describes how restoration activities will be implemented in impacted areas. The Restoration Plan includes objectives such as assessment, restoration, enhancement of natural resources, and habitat acquisition.

Ground Waters

Ground water is one of Alaska's least understood natural resources. It is the major source of fresh water for public and private drinking water supply systems, industry and agricultural development. Although ground water is presumed to be of excellent quality in most areas of the state, specific areas of generally good ground water quality have been degraded by human activities. Ground water resources do not appear to be threatened by withdrawals, i.e., the state has few, if any, aquifers that are known to be decreasing due to withdrawals. While there is information on specific contaminated sites that affect ground water quality, there currently is insufficient information to determine the extent and degree of ground water aquifer contamination through aquifer-specific monitoring. Although Alaska has no comprehensive list of ground waters that are contaminated, the state does maintain a database to track sites where soil and waters have been impacted from petroleum and hazardous substances releases.

Of the approximately 2,700 statewide contaminated sites in ADEC's contaminated sites and underground storage tank databases, there are more than 200 sites where there is documentation that links the polluted sites to impacted ground waters. The specific extent of contamination is typically unknown, but at most of these sites it is presumed to be generally localized; in some areas ground water impacts may be more extensive. Areas with significant known ground water

contamination include: the Fairbanks area including Eielson Air Force Base and North Pole; Anchorage area; Kenai area; Bettles; Big Lake; Valdez Creek mine near Cantwell; Chugiak; Gakona; Gambell; Healy; Marshall; Minto; Shemya; Solomon; Sterling; Tok; and Wasilla.

Petroleum products constitute the primary contaminant of ground water. Approximately 90% of contaminated site areas are polluted with petroleum. Many of those sites are also affected by other pollutants, but petroleum is the most prevalent contaminant. Other contaminants include chlorinated solvents, heavy metals, pesticides, cyanide, arsenic, nitrates and fecal coliform. Although nitrates are suspected of occurring naturally in ground water in association with nitrogen-fixing organisms, on-site septic systems have been implicated as significant sources of ground water contamination. Free arsenic rarely occurs naturally unless the ores that contain it are disturbed for recovery of precious metals.

Alaskans obtain drinking water from approximately 510 Class A, 1,100 Class B, and 900 Class C ground water based public drinking water supply systems. Water quality at the tap is monitored routinely for Class A and Class B systems, providing a measure of relative ground water quality. When a well is closed down due to contamination, the contaminated sites program is notified and assumes responsibility for tracking the investigation and remediation of the contamination. The ADEC drinking water program maintains a database of analytical results for each of the public water supply systems it regulates. The database also includes basic information such as well location and owner. Specific information on locations of leaking underground storage tanks (LUST) and other contaminated sites that are likely sources of ground water contamination may be obtained by contacting ADEC staff with the groundwater contaminated sites and/or LUST programs.

III. THE WATER QUALITY ASSESSMENT PROCESS

Background

ADEC submitted Section 305(b) reports to the EPA biennially between 1986 and 1992. Section 303(d) waterbody lists were completed separately for 1990, 1992 and 1994. The process of assessing waterbodies for water quality has evolved to include other sources of information outside of ADEC. The public participation process has broadened as more individuals and groups become interested in the water quality assessment report and waterbody lists, and provide more documentation on water quality. This is evident by the size of this years public review mailing list (over 450) and the number of organizations and individuals responding (40 responded or 9% response rate) to the draft 1996 Water Quality Assessment Report public notice.

ADEC did not publish a 1994 Section 305(b) report due to limited staff resources. The Department did, however, prepare and submit a 1994 Section 303(d) list of water quality-limited surface waters to EPA in May 1994. This list submittal was disapproved by EPA for failing to include additional waterbodies which met EPA listing criteria. The decision by EPA to disapprove the 1994 list mandated that development of the 1994 Section 305(b) report be deferred so that staff could concentrate on gaining approval of the 1994 list.

Completing Alaska's 1994 Section 303(d) list turned into a lengthy process, with EPA concurrence given on August 31, 1995. Information gathered for the 1994 Section 303(d) reporting process was then used to develop the 1996 draft of this report. The draft report was released for agency and public comment between February 1 and March 1, 1996. After an internal review and analysis of the comments, the draft report was revised into this final document.

Sources of Information

The water quality assessment process for this report relied on water quality information from numerous sources, including: government agencies at the local, state, and federal level; industries; environmental organizations; a variety of reports and publications; and the public.

ADEC would like to extend its appreciation in particular to the following agencies, groups, and individuals who provided comments and information for this report:

U.S. Environmental Protection Agency
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University of Alaska, Fairbanks
Kodiak Island Borough
Municipality of Anchorage
City of Petersburg
Resource Development Council
Unocal Oil Corporation
Alyeska Pipeline Service Co.
Trident Seafoods Corporation
Tongass Hunting & Fishing Coalition
Sealaska Corporation
Gwen F. Ilban, Ketchikan
Marathon Oil Company
BP Exploration (Alaska), Inc.
U.S. Fish and Wildlife Service

U.S. Forest Service U.S. National Park Service

Point Sources and Nonpoint Sources

Water quality pollutant sources may be generally divided into point sources and nonpoint sources. Some activities, such as oil and gas development and mining, include both point and nonpoint sources. Point sources primarily originate from industrial facilities and municipal sewage treatment plants, where the discharge of wastewater or treated effluent can be pinpointed to a discrete pipe or ditch. Point source pollutants are subject to regulation by federal and state wastewater discharge permits.

Nonpoint source pollutants are all other sources, which are characterized as area-wide and cause diffuse discharges of pollutants to land and/or water. Nonpoint sources include timber harvest, land development and roadways, urban runoff, septic systems, and leaking fuel storage tanks.

The Assessment Process

This year's water quality assessment process represents a summary of existing data and best professional judgement for compliance with the Alaska Water Quality Standards (Title 18 AAC Chapter 70). The assessment process relies on information obtained generally within the last five years. Summarizing information for this effort began in November 1993 and continued through March 1996. For purposes of this report, the term "assessment" means the process of collecting and evaluating available water quality data and other information, including best professional judgement, to determine if an individual waterbody meets the criteria for inclusion in the 1996 Section 303(d) list or other status categories. The individual status categories and the process used for waterbody listings are further defined in Section IV of this report.

Given the geographic size of Alaska and the limited amount of water quality data that has been consolidated and evaluated by ADEC, the assessment of waters summarized in this report is somewhat limited in scope. As with many states, limited data preclude characterizing detailed levels of pollutants in most waterbodies, and prevent determining the extent and segment(s) -- in acreage or miles -- of impairment in most waters. The lack of data underscores the need for improved and expanded ambient water quality monitoring in priority watersheds in order to more completely evaluate and further consolidate existing water quality data from agencies, organizations, educational institutions, industry, and the public.

Water Quality Standards

The protection of surface and ground waters occurs primarily through the development, adoption, and implementation of the water quality standards. The standards specify the degree

of degradation that may not be exceeded in a state waterbody as a result of human actions. The most recent revisions to the water quality standards occurred in January 1995 and March 1996.

The water quality standards designate specific uses for which water quality must be protected, and specifies the pollutant limits, or criteria, necessary to protect designated uses. There are seven designated uses for fresh waters, and seven designated uses for marine waters specified in state standards.

The **seven (7) freshwater uses** are: drinking water; agriculture; aquaculture; industrial; contact recreation; non-contact recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The **seven (7) marine water uses** are: aquaculture; seafood processing; industrial; contact recreation; non-contact recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

For each of the 14 freshwater and marine uses, the state standards specify criteria for a variety of parameters or pollutants. The criteria are both numeric and descriptive. The pollutant parameters are fecal coliform bacteria, dissolved oxygen, pH, turbidity, temperature, dissolved inorganic substances, sediment, toxic substances, color, petroleum hydrocarbons, radioactivity, total residual chlorine, and residues (floating solids, foam, debris, deposits). In the Section 305(b) and Section 303(d) assessment process, waterbodies are compared to the criteria for these parameters to determine if water quality violations occur, and if so into which status category waterbodies are listed.

The water quality standards also contain provisions for antidegradation, mixing zones, and carcinogenic risk levels for chemical contaminants. The antidegradation regulation is identical to federal law and requires protection of high quality waters such as waters of a national or state park, wildlife refuge, or a water of exceptional recreational or ecological significance.

Mixing zones are designated areas of a waterbody where wastewater enters and mixes with the receiving water. ADEC is currently in the process of revising the mixing zone regulations, with public input, to clarify issues relating to size limits for rivers and streams, toxics, and lethality. ADEC retains the authority to grant or deny a mixing zone based on the factual data presented.

The carcinogenic risk levels for chemical contaminants in Alaska waters is a factor of 1 in 100,000 for the 54 carcinogens for which human health criteria are established. The state has not yet adopted human health criteria specifically for Alaska, but relies on national standards to set

limits for carcinogens, until such time that the state adopts more specific standards.

Alaska Watershed Monitoring and Assessment Project (AWMAP)

The Alaska Watershed Monitoring and Assessment Project (AWMAP) is a statewide water quality monitoring project involving local, state, and federal agencies; industry; schools; University of Alaska; and other entities conducting water quality monitoring. It recognizes that carrying out a comprehensive water quality monitoring program requires the involvement of many agencies.

The AWMAP framework was developed cooperatively between ADEC and EPA to address Section 303(d) of the CWA. A draft AWMAP report (October 1995) was prepared that describes the extent of water quality monitoring activity in the state and identified water quality monitoring gaps in relation to statewide monitoring activity. The AWMAP report represents the first step in developing an improved statewide water quality monitoring program. If all AWMAP program objectives were fully implemented, Section 305(b) reporting information and Section 303(d) lists would be based on a more comprehensive statewide water quality database from information provided by the numerous monitoring "cooperators."

One AWMAP objective that was recently completed by ADEC is determining the extent of water quality monitoring activity in Alaska. To obtain the necessary information, ADEC polled more than 330 organizations and agencies in Alaska. The mailed responses and follow-up telephone interviews were computer cataloged into the AWMAP database and are referred to as the AWMAP directory. The AWMAP directory identifies the locations, waterbodies, and types of water quality monitoring planned and conducted. This information will help ADEC determine the level of monitoring for each waterbody, and where there may be monitoring gaps in relation to land-uses and other potential sources of pollution.

The AWMAP report identifies areas of the state (by USGS hydrologic unit) where water quality monitoring is either absent or insufficient to address the potential pollution sources.

The AWMAP report also recommends the following specific steps to address water quality monitoring deficiencies:

1. Develop a network of individuals interested in and/or involved in the collection of environmental data from state and federal agencies, Native communities, universities, non-governmental organizations and private companies. Where possible, utilize existing technical groups already established. Each of the networks would be

geographic in scope, including Southeast, Southcentral, Interior, North Slope, Southwestern, and Northwest Alaska. This geographic distinction recognizes the cultural and ecological differences of Alaska.

2. Maintain, enhance, and expand the collection and collation of AWMAP information on the location of existing monitoring stations and programs operated by state and federal agencies, universities, non-governmental organizations, and private companies. Develop a map showing locations of existing monitoring locations, and complete a statewide inventory in an ArcView compatible format. Coordinate map construction with advisory panel participants and the University of Alaska as part of a Geographic Information System which links pertinent information together.

3. Identify priority statewide management issues, priority rank watersheds for monitoring application and water quality restoration, and identify priority watershed information needs.

4. Develop a list of environmental indices (biological, chemical, and physical) for short and long-term monitoring that will allow for the assessment of water quality contaminants and their effects throughout Alaska (of special importance are contaminants that can be transported and bioconcentrated through the food chain or have negative impacts on human health). Coordinate development of an environmental indices list with technical advisory groups and the University of Alaska. Monitoring must be determined in the context of identified problems and the participating agencies and local entities, watersheds of concern, and pollutant source contributions. A variety of monitoring alternatives may be necessary and any decisions should be made in an open, democratic process.

5. Coordinate reporting of existing data and receipt of future data from existing monitoring stations in the state. Through written surveys, telephone interviews, letters and office visitations, prepare and maintain an inventory of statewide data collection efforts. Initial efforts will focus on the institutional framework as well as the data format. Develop a unified data management system to receive future monitoring submissions in coordination with technical advisory groups and the University of Alaska.

6. Develop a common set of criteria against which information will be evaluated. Ease of use for both researchers, decision makers, and the public is vital in any set of criteria. Evaluate all water quality data sets, existing or in the development stage, for

compatibility with storage and retrieval of Alaska's existing and future data sets. Using an ArcView compatible format, enter database descriptors and data access requirements for each monitoring station into the Geographical Information System. These descriptors should include the type of water quality monitoring employed and the duration of the effort.

7. Develop recommendations annually for locations and types of additional monitoring stations required to meet the overall goal of monitoring water quality in Alaska's diverse environment. Final recommendations are coordinated through technical advisory groups and a statewide advisory panel.

8. Issue alternate year reports to the Section 305(b) reporting process on the status of Alaska's Watershed Monitoring and Assessment Project. These reports would provide a detailed summary of statewide monitoring and related activities that could be used to help develop subsequent Section 305(b) reports and Section 303(d) waterbody lists.

AWMAP information will be incorporated in development of the statewide Watershed Management Framework discussed on page three of this report.

Other Monitoring Activities

Other water quality monitoring activities are conducted by ADEC, other agencies, industry, and the public. Examples of water quality monitoring and other data collection projects in Alaska include the following:

- Applicant self-monitoring of receiving waters is a common permit requirement associated with Alaska's major point source dischargers. This provides permit compliance information at major industrial facilities throughout Alaska.

- ADEC, in cooperation with the Alaska Department of Natural Resources (ADNR), has periodically conducted water quality monitoring related to placer mining. Automated equipment has been used to measure turbidity at remote placer sites, with data sent by satellite link to a receiving station.

- Water quality studies by ADEC and other agencies have taken place in response to events such as the 1989 Exxon Valdez oil spill in Prince William Sound, Skagway Harbor contamination by heavy metals from an ore loading terminal, and the Ketchikan Pulp Company pulp mill discharges into Ward Cove near Ketchikan.

- Implementation of the State Ground Water Quality Protection Strategy is continuing, encouraging increased ground water monitoring.

- The ADEC shellfish program approves growing areas for wild harvest or aquaculture operations and monitors for fecal coliform exceedances. It also conducts shoreline/uplands surveys to identify and quantify pollution.

- With ADEC assistance, U.S. Forest Service (USFS) staff have conducted Best Management Practices (BMP) monitoring on National Forest lands. Two forest practices water quality monitoring projects are in progress on private land. One project is being conducted by Sealaska Corporation and the Alaska Forest Association, and the other by ADNR, ADEC and Atikon Forest Products.

- ADEC facilitated the water quality assessment phase of Lake Lucille in Wasilla and oversees the monitoring and analysis conducted by the ADF&G of several lakes in the Kenai Peninsula and Anchorage area through the EPA Clean Lakes grant.

- ADEC staff in the watershed management program, in cooperation with local governments and developers, have focused monitoring efforts on waterbodies identified on the Section 303(d) list, including assessments and restoration plans where needed.

- The Municipality of Anchorage has conducted water quality monitoring on lakes and streams within its boundaries that has provided information for water quality assessments.

- The U.S. Geological Survey conducts ambient monitoring of hydrologic parameters and also collects some water quality data. Other federal agencies, such as the USFS, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service, also conduct independent water quality investigations relating to waterbody restoration and other agency objectives.

IV. 1996 WATERS OF CONCERN

Previous 305(b) Waterbody Lists

The 1992 Section 305(b) report includes the following lists of waterbodies:

1) **Impaired Surface Waterbodies** (Section 303(d) designated waterbodies and other water quality-limited waters);

2) **Suspect Surface Waterbodies** (surface waters that were suspected of being affected by

some type of pollution); and

3) **Impaired Ground Waters** (contaminated sites suspected of contributing to groundwater impairment).

In 1996, ADEC decided to eliminate the unnecessary overlap between waterbody lists by listing each surface water only once, with a narrative explanation of what the status of each waterbody is. Water quality-limited waterbodies evaluated by ADEC which did not qualify for the 1996 Section 303(d) list were placed on a "monitoring and tracking list" rather than on an "impaired" list.

Because of concerns expressed by Department staff, industry, and the public about the defensibility of the "suspect" and "impaired ground water" lists - and the fact that neither list is required by EPA - the Department also decided not to include these lists in this report. Instead, "suspect" surface waters and contaminated sites previously listed in past Section 305(b) reports will be maintained internally within the Department. ADEC's internal list of suspect surface waterbodies, and/or the internal list of contaminated sites, may be obtained by contacting ADEC water quality protection staff at the Department's Juneau office.

Water Quality-Limited Waterbodies

Water quality-limited waterbodies are surface waters with documentation of actual or imminent persistent exceedances of water quality criteria, and/or adverse impacts to designated uses, as defined in the state's water quality standards. Designation of a waterbody as "water quality-limited" does not necessarily indicate that the entire waterbody is affected. In most cases only a segment of the waterbody is affected.

Where possible, the assessment process identifies the specific segment that is water quality-limited and the corresponding pollutant parameters of concern.

The term "persistent" is key in the process to help determine if a surface waterbody is water quality-limited. Determining "persistent" exceedances of water quality standards is a waterbody-specific decision that requires the application of best professional judgement, and includes discussion and analysis of a variety of factors including: pollutant characteristics, pollutant sources, size of the waterbody, and the degree of remediation response required.

The following guidelines are used by ADEC to determine if a waterbody is water quality-limited:

1) Water quality monitoring data that documents persistent exceedances of a criterion or

criteria established in the water quality standards;

2) Issuance of a notice of violation or other enforcement action definitively linked to a persistent water quality violation that does not result in adequate corrective measures;

3) Photographs or videos with appropriate documentation definitively linked to persistent exceedances of water quality standards;

4) Documented persistent presence of residues (floating solids, debris, sludge, deposits, foam, scum) on or in the water, on the bottom, or on adjoining shorelines;

5) Documentation such as a report or study within the last five (5) years that concludes designated uses are adversely affected by pollutant conditions;

6) Documentation from a resource agency professional or other credible source where the use of "best professional judgement" is applied to determine if a subject waterbody has persistent exceedances of water quality standards, may be subject to imminent criteria exceedances, or designated uses are adversely affected by pollutant sources.

303(d) Criteria for Listing

According to Section 303(d) of the federal Clean Water Act and EPA's implementing regulations, Section 303(d) designated waters include **water quality-limited surface waters that do not or are not anticipated to meet applicable water quality standards solely through the implementation of existing technology-based or similar controls by the next Section 303(d) listing cycle (every two years)**. 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.

A **waterbody recovery plan** describes the process and steps to be taken to restore a water quality-limited waterbody to a condition which meets the water quality standards for the pollutant parameters indicated. A waterbody recovery plan may include a Total Maximum Daily Load (TMDL), described in accordance with Section 303(d)(4)(A) of the Clean Water Act to include effluent limitations based on a TMDL wasteload allocation.

To **prioritize** Alaska's 1996 Section 303(d) list, ADEC considered the following factors:

1) Severity and persistence of pollutant sources, standards exceedances and impacts to designated uses.
2) Applicability of existing pollution controls, waterbody recovery plans,
3) and NPDES discharge permits.
4) Significance of the waterbody in terms of public and resource values.
5) Waterbody assessment history and data availability relative to the waterbody.
6) Technical feasibility of conducting a water quality assessment.
7) Degree of public and agency concern relating to the waterbody.
8) Availability and accuracy of reported water quality information.
9) Feasibility of waterbody recovery plan implementation.

Although a strict interpretation of Section 303(d) requires a list of water quality-limited waterbodies which are not expected to meet standards without additional controls, most 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. The 1994 Section 303(d) listing process, prompted by a federal lawsuit against EPA, was designed to err in favor of including a waterbody even if the water had not been fully evaluated for it's appropriateness on the Section 303(d) list. For 1996, ADEC more closely scrutinized waterbodies to determine if suspected water quality violations were thoroughly investigated and documented. This approach is designed to prevent the listing of waterbodies with inconclusive or circumstantial data and/or observation. If flaws in the original analysis that led to the waterbody being listed are identified and documented, these waterbodies may be de-listed.

In 1996, Section 303(d) designated waterbodies are priority ranked into two tiers (Tiers I and II). Two additional tiers (Tiers III and IV) were created for waterbodies that are <u>not</u> Section 303(d) listed. The following is an explanation of each tier category and it's corresponding criteria.

The following two tiers of Section 303(d) waterbodies are listed, priority ranked and described in Appendix A:

Tier I: Water quality-limited waterbodies for which ADEC has documentation to indicate that the requirements of Section 303(d) list criteria are met, but the waterbodies have not yet undergone comprehensive water quality assessments to: 1) verify the extent of water quality criteria exceedances; and 2) confirm that they cannot meet water quality standards under existing

technology-based or similar controls by the next listing cycle (April 1998).

Tier II: Water quality-limited waterbodies which meet requirements of Section 303(d), and have undergone comprehensive water quality assessments to determine the most effective methods for water quality restoration through the application of waterbody recovery plans. **The following tier includes water quality-limited waterbodies which are <u>not</u> Section 303(d) designated, and are listed and described in Appendix B:**

Tier III: Water quality-limited waterbodies that have an implemented waterbody recovery plan (such as an EPA-approved TMDL, ***or*** identified existing controls which provide ADEC assurances that water quality standards are likely to be met by the next listing cycle). These waterbodies are priority ranked and tracked by ADEC until state water quality standards are achieved.

The following tier includes waterbodies which have been evaluated through the waterbody assessment process, and are <u>no longer</u> considered to be water quality-limited. These waters are listed and described in Appendix C:

Tier IV: Evaluated waterbodies which require no further action at this time. For the purpose of the Department's waterbody assessment process, there is sufficient documentation the waterbody is no longer water quality-limited and the file will be closed. Tier IV waterbodies may be brought to ADEC's attention at any time for re-evaluation.

303(d) Listing and De-listing Process

Alaska's process for the "listing" of an individual waterbody to Section 303(d) designation begins with the Department's internal list of waterbodies suspected of being affected by some type of pollution. These waters may be brought to the attention of ADEC by Department staff, other state and federal agencies, industry, municipalities, Native organizations, environmental groups, and the concerned public. Once a waterbody has been placed on the Section 303(d) list, the process for "de-listing" a waterbody requires documentation that Tier III **or** Tier IV criteria have been met.

Please refer to the flow chart on page 30 which illustrates the waterbody assessment process for determining water quality-limited status, listing of waterbodies, and de-listing of waterbodies.

A suspect waterbody initially undergoes an evaluation of available information to determine the presence of pollution and/or persistent exceedances of water quality standards or impacts to the

designated uses. This process constitutes an ADEC desk audit, may involve preliminary field review and the collection of water quality monitoring data, and should result in one of the following:

- Information on a suspect water indicates the waterbody may be water quality-limited, and that existing controls may be inadequate to attain or maintain standards by the next listing cycle. The waterbody is placed on the Tier I Section 303(d) waterbody list. Tier I Section 303(d) waterbodies are scheduled for comprehensive water quality assessments.
- Information on a suspect water indicates the waterbody may be water quality-limited, and that existing controls are adequate to attain or maintain standards by the next listing cycle. The waterbody is placed on the Tier III waterbody list. Tier III waters are tracked and monitored until standards are achieved.
- Information on a suspect water determines the waterbody is not water quality-limited. The waterbody is placed on the Tier IV waterbody list. Tier IV waters require no further action, but may be reconsidered at any time.

A completed water quality assessment on a Tier I Section 303(d) waterbody confirms the extent of impairment to water quality and/or designated uses. A comprehensive assessment requires the identification of pollution sources and corresponding pollutant parameters, and should result in one of the following:

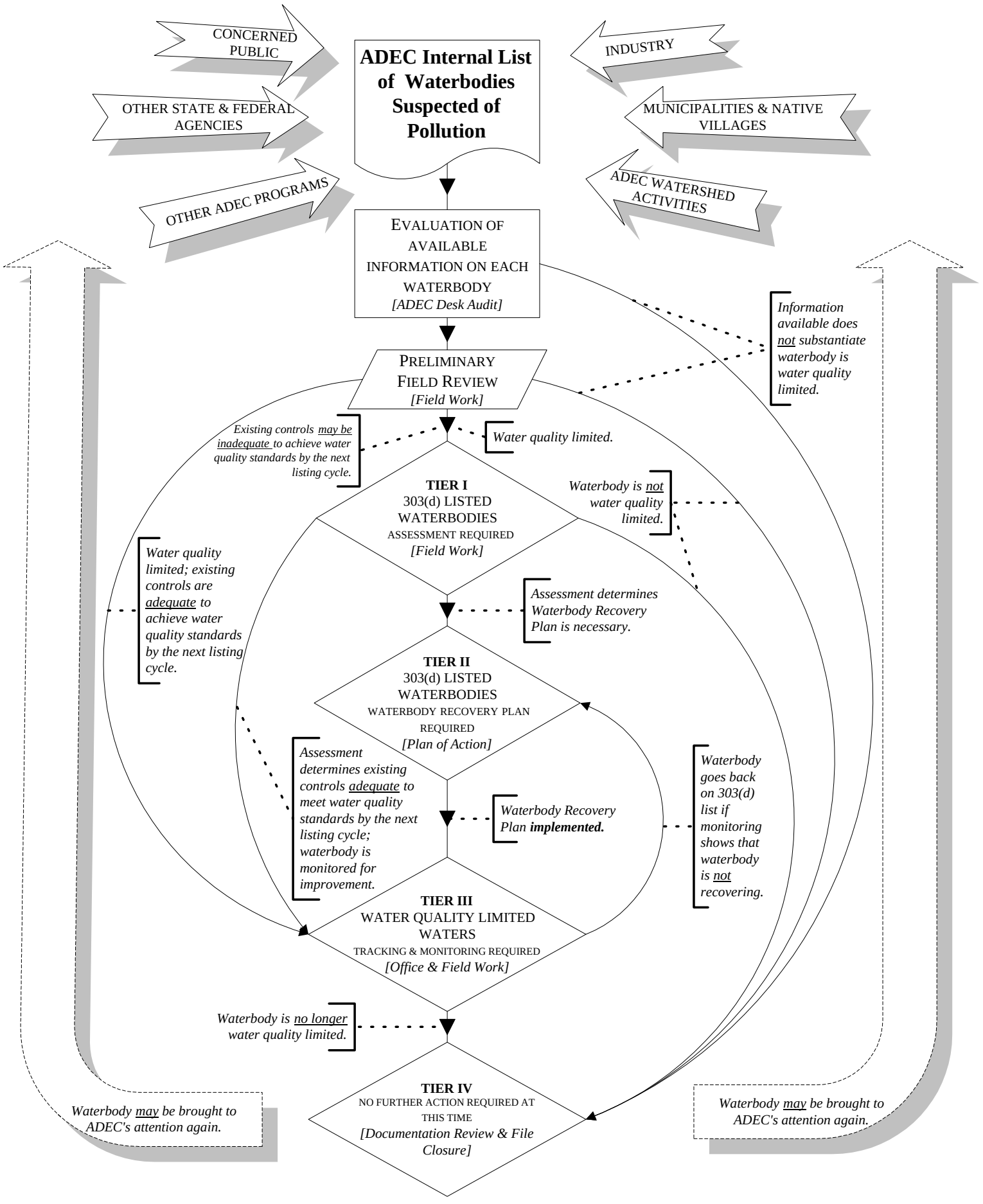
- Assessment determines the waterbody is water quality-limited and that existing controls are inadequate to achieve water quality standards by the next listing cycle. The waterbody is placed on the Tier II list of Section 303(d) waters. Tier II Section 303(d) waterbodies require waterbody recovery plans.
- Assessment determines the waterbody is water-quality limited, but confirms existing controls are adequate to achieve standards by the next listing cycle. The waterbody is placed on the Tier III list.
- Assessment determines that the waterbody is not water quality-limited. The waterbody is placed on the Tier IV list of waters which require no further action at this time.

Tier II Section 303(d) waterbodies that have implemented waterbody recovery plans may be moved to the Tier III list. If monitoring determines that a waterbody on the Tier III list is not recovering, that water may be put back on the Tier II Section 303(d) list in the next two year listing cycle. Tier IV waterbodies may be brought to ADEC's attention at any time for re-evaluation and/or placement on the Department's internal suspect waters list.

Section 303(d) designated waterbodies are approved by EPA after public review and comment.

Alaska's 1996 Section 303(d) list was approved by EPA on May 21, 1996 and contains the Fifty-one (51) waterbodies listed in Appendix A.

ALASKA'S WATERBODY ASSESSMENT PROCESS



APPENDIX A

1996 SECTION 303(d) LIST and PRIORITIZATION SCHEDULE

and

WATERBODY-SPECIFIC MATRIX (TIERS I AND II)

1996 SECTION 303(d) LIST and PRIORITIZATION SCHEDULE

TIER I **Section 303(d) listed water quality-limited waterbodies which require water quality assessments to verify the extent of pollution and what controls are in place or needed.**		**TIER II** **Section 303(d) listed water quality-limited waterbodies which have completed water quality assessments and now require waterbody recovery plans. Recovery plan not implemented.**
H-Naknek River	**M**-Crooked Creek Drainage	**H**-Ward Cove
H-Eskimo Creek	**M**-Dutch Harbor	**H**-Akutan Harbor
H-King Cove	**M**-Granite Creek	**H**-Red Fox Creek
H-Popof Strait	**M**-Harding Lake	**H**-King Salmon Creek
H-Ship Creek	**M**-Hood/Spenard Lake	**H**-Birch Creek Drainage
H-Thorne Bay	**M**-Noyes Slough	**H**-Silver Bay
H-Shoemaker Bay	**M**-Wrinkleneck Creek/ Swan Lake	**M**-Duck Creek
H-Rowan Bay	**M**-Caribou Creek	**M**-Eagle River Flats
H-Hamilton Bay	**M**-Little Survival Creek	**M**-Fish Creek
H-Red Dog Creek/ Ikalukarok Creek	**M**-Jewel Lake	**M**-Garrison Slough
M-Chena River	**L**-Furrow Creek	**M**-Goldstream Creek
M-Chena Slough	**L**-Pederson Hill Creek	**M**-Chester Creek
M-Cheney Lake	**L**-Skagway Harbor	**L**-Cabin Creek
M-Red Lake/ Anton Road Ponds	**L**-Udagak Bay	**L**-Campbell Creek
M-Slate Creek	**L**-Illiuliuk Bay/Harbor	**L**-Campbell Lake
M-Little Rabbit Creek	**L**-Klag Bay	**L**-Little Campbell Creek
		L-Lake Lucille
		L-University Lake
		L-Westchester Lagoon

H - High Priority **M -** Medium Priority **L -** Low Priority

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20502-101	Caribou Creek	Denali National Park	Turbidity	Mining	This waterbody was placed on the 1994 Section 303d list for turbidity and habitat modification. There is no state water quality standard for habitat modification unless correlated to an effect to a designated use. Insufficient information in file on effects to any designated uses from habitat modification. A State Division of Mining memorandum dated March 5, 1996 requests waterbody be delisted since data to support listing is more than a decade old, no mining has been allowed near the stream for fourteen years, and revegetation is likely to be complete or near so. National Park Service (NPS) letter dated March 28, 1996 requests waterbody remain on 303d list because stream is impaired from past placer mining disturbances and restoration is required to stabilize channels, create functioning floodplains, and promote establishment of vegetation communities. Annual flooding causes erosion because of sparse vegetation from the past placer mining activity. This waterbody should have an interagency field inspection conducted Summer 1996 to confirm water quality issues and whether additional controls are necessary.
40506-007	Chena River	Fairbanks	Petroleum Products	Urban	This waterbody was placed on the 1994 Section 303d list for turbidity, sediment, and habitat modification. A State Division of Mining memorandum dated March 5, 1996 provided information indicating that turbidity and sedimentation was the result of a one-time placer mining settling pond failure that was repaired, therefore recommended dropping turbidity and sediment parameters. This was verified by ADEC staff in Fairbanks. Insufficient information in file on effects to any designated use from habitat modification. Some information in file on petroleum products spills that reach waterbody; best professional judgement from ADEC staff in Fairbanks is to list waterbody for petroleum products.
40506-002	Chena Slough	Fairbanks	Petroleum Products, Sediment	Urban Runoff, Septic Tanks	This waterbody was placed on the 1994 Section 303d list for petroleum products and sediment-no additional information has been evaluated by ADEC since then. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum product problem does exist and is affecting water quality. File assessment information indicates nonpoint source problems result from surface water run-off, road construction, site clearing, and de-watering activities from gravel operations. Based on best professional judgement of ADEC's Fairbanks Office this waterbody should be listed for petroleum products.

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20401-403	Cheney Lake	Anchorage	Fecal Coliform	Septic Tanks	This waterbody was placed on the 1994 Section 303d list for fecal coliform-no additional information has been evaluated by ADEC since then. The Municipality of Anchorage's 1991-1994 data indicates that the fecal coliform criterion is being exceeded in almost every monitoring month. The source of the fecal coliform is believed to be human-caused due to septic tank usage adjacent to the waterbody.
40402-010	Crooked Creek Watershed - Bonanza Creek - Crooked Creek - Deadwood Creek - Ketchem Creek - Mammoth Creek - Mastodon Creek - Porcupine Creek	North of Fairbanks	Turbidity	Placer Mining	This watershed was placed on the 1994 Section 303d list for turbidity. A comprehensive waterbody assessment is presently being drafted for this watershed and is expected to be completed by Summer 1996.
30401-601	Dutch Harbor	Unalaska Island	Petroleum Products	Industrial, Urban Runoff, Septic Tanks	This waterbody was placed on the 1994 Section 303d list for petroleum products-no additional information has been evaluated by ADEC since then. The August 25, 1994 Water Quality Assessment for Greater Unalaska Bay identified the waterbody as being impacted by petroleum products. A more specific waterbody assessment for Dutch Harbor is needed to validate the water quality issues and determine whether additional controls are necessary.
30204-023	Eskimo Creek	King Salmon	Petroleum Hydrocarbons, Metals, Pesticides, Trichloroethylene	Landfill, Fuel Storage	This waterbody was placed on the 1994 Section 303d list for petroleum hydrocarbons, metals, and pesticides. Based on information provided by the EPA's Comprehensive Environmental Response Compensation Liability Act (CERCLA) group, seeps from a dump adjacent to Eskimo Creek have led to stream water contamination by metals, pesticides, and petroleum hydrocarbons. Additional information was provided by ADEC's Anchorage Office to list this waterbody for an additional parameter, trichlorethylene.

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20401-006	Furrow Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform-no additional information has been evaluated by ADEC since then. Based on Municipality of Anchorage water quality monitoring data, the levels of fecal coliform exceed the designated use criteria for drinking water, primary contact recreation, and occasionally for secondary contact recreation. The source of the fecal coliform is presumed to be human-caused from urban runoff sources.
10203-005	Granite Creek	Sitka	Turbidity, Sediment	Gravel Mining	This waterbody was placed on the 1994 Section 303d list for turbidity and sediment. A citizen provided an assessment form that describes how industrial gravel extraction activity has caused water quality problems. An ADEC site inspection of the gravel operation indicated that suspended sediment and associated higher levels of turbidity were occurring at the gravel pit holding ponds. Other ADEC information indicates that turbidity and sedimentation problems have occurred on Granite Creek over the past several years.
10202-601	Hamilton Bay	Kake	Debris	Log Transfer Facility	This waterbody was placed on the1994 Section 303d list for debris. A recent dive survey report indicated that excessive bark still exists on the bottom of Hamilton Bay as a result of logging operations on Kupreanof Island that use the Hamilton Bay log transfer facility.
40505-401	Harding Lake	Fairbanks	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform-no additional information has been evaluated by ADEC since then. Based on information/data presented in a report titled Harding Lake Fecal Coliform investigation, July 18, and August 20 1988, several sites near the outer banks of Harding Lake have fecal coliform levels which are 10 times higher than the regulated amount. Since the data covers only a two month time span in 1986, current conditions could not be established. A representative from the Park Service working near Harding Lake also identified several other concerns: 1) there has been a measurable drop in lake level over several years; 2) there has been a noticeable decline in the number of pike in the past few years (the ranger found at least 30 dead pike in one location in Harding Lake); and finally, there is a high housing density along the shoreline of Harding Lake and that all of these homes utilize on-site sewage disposal systems. Because of the limited fecal coliform data it cannot be fully verified that the waterbody is water quality limited for fecal coliform. However, based on the limited sample results and the high population density using on-site wastewater disposal systems, it is likely that additional monitoring will verify that the waterbody is water quality limited for fecal coliform.
20401-412	Hood/Spenard Lake	Anchorage	Fecal Coliform,	Urban Runoff,	This waterbody was placed on the Section 303d list for fecal coliform, lead, nitrates, and phosphates. Anchorage International Airport submitted some additional information that

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
			Nitrates, Phosphates, Lead	Industrial	suggested the source of the fecal coliform in the waterbody was non-human caused. Based on the Airport Water Quality Study for Anchorage International Airport, June 1993 exceedingly high nitrates and phosphates are entering the waterbodies. The data also show exceedances of the fecal coliform and lead water quality criteria. A waterbody assessment is planned Summer 1996 to formally validate the sources and types of pollutants and if additional controls are necessary.
30102-602	Illiuliuk Bay/Harbor	Dutch Harbor	Petroleum Products	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for petroleum products-no additional information has been evaluated by ADEC since then. An EPA August 1994 Water Quality Assessment for Greater Unalaska Bay which included Illuliuk Harbor/Bay concluded that Illiuliuk Harbor/Bay is impacted by intermittent spills for petroleum products and chronic sewage runoff and that existing controls can resolve the problems. Anchorage ADEC staff indicate the waterbody is regularly affected by petroleum spills and that until the controls resolve the petroleum spills/seeps problem, the waterbody should be 303d listed.
20402-409	Jewel Lake	Anchorage	Fecal Coliform	Urban Runoff, Land Development	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The source of the fecal coliform exceedances (whether human caused or caused by non-human sources such as wildlife), has been an issue with this waterbody between the Municipality of Anchorage, ADEC, and EPA. While ADEC provided additional source information to EPA in March 1996 that indicated the source of the fecal coliform was from non-human sources, ADEC subsequently agreed with EPA that determining the source of the fecal coliform is best resolved by the more detailed waterbody assessment process required by Tier 1 designation. A waterbody assessment required by Tier 1 designation will provide more definitive information on the source of the fecal coliform exceedances that can serve as the basis for a waterbody recovery plan - if needed as determined by the waterbody assessment.
30101-601	King Cove	King Cove	Seafood Residue	Seafood Processing/ Waste	This waterbody has NOT been previously listed as a Section 303d waterbody. Information provided by the Aleutians East Borough and verified by ADEC staff included citizen complaints, photographs, and other information to indicate that persistent exceedances of "seafood residue" occur from seafood processing activity operating adjacent to the waterbody.

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
10203-602	Klag Bay	Chichagof Is.	Metals	Mining	This waterbody was placed on the 1994 Section 303d list for metals-no additional information has been evaluated by ADEC since then. Past mining has resulted in the deposition of large amounts of tailings in Klag Bay. A draft 1985 report on Klag Bay titled "Klag Bay Study" prepared by the U.S. Fish and Wildlife Service indicates high levels of metals from tailings are leaching into the bay. These metals have caused abnormalities in numerous blue mussels. These abnormalities are considered an impairment of a designated use.
20401-024	Little Rabbit Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The source of the fecal coliform exceedances (whether human-caused or caused by non-human sources such as wildlife), has also been an issue with this waterbody between the Municipality of Anchorage, ADEC, and EPA. While ADEC provided additional source information to EPA in March 1996 that indicated the source of the fecal coliform was from non-human sources, ADEC subsequently agreed with EPA that determining the source of the fecal coliform is best resolved by the more detailed waterbody assessment process required by Tier 1 designation. A waterbody assessment required by Tier 1 designation will provide more definitive information on the source of the fecal coliform exceedances that can serve as the basis for a waterbody recovery plan - if needed as determined by the waterbody assessment.
20401-018	Little Survival Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The source of the fecal coliform exceedances (whether human-caused or caused by non-human sources such as wildlife), has also been an issue with this waterbody between the Municipality of Anchorage, ADEC, and EPA. While ADEC provided additional source information to EPA in March 1996 that indicated the source of the fecal coliform was from non-human sources, ADEC subsequently agreed with EPA that determining the source of the fecal coliform is best resolved by the more detailed waterbody assessment process required by Tier 1 designation. A waterbody assessment required by Tier 1 designation will provide more definitive information on the sources of the fecal coliform exceedances that can serve as the basis for a waterbody recovery plan - if needed as determined by the waterbody assessment.

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
30204-001	Naknek River	King Salmon	Petroleum Hydrocarbons, Metals	Landfill, Fuel Storage	This waterbody was placed on the 1994 Section 303d list as a waterbody which is not expected to meet water quality standards because of pollutant sources coming from tributary waterbodies (Eskimo Creek, King Salmon Creek, and Red Fox Creek). The Bristol Bay Borough supports continued investigation of the pollutant source waterbodies that threaten the Naknek River. Based on documentation from the Comprehensive Environmental Response Compensation Liability Act (CERCLA) group, a fuel storage area and other pollutant sources in the tributaries may seep petroleum hydrocarbons and metals into the waterbody. Because data is not available on the level of dilution from the large water flow in the Naknek River, it could not be documented that the waterbody currently has exceedances of water quality standards. However, because contaminants are likely seeping into the river, the waterbody is listed on Tier 1 of the 303d list until more definitive data can be collected through a waterbody assessment process.
40506-003	Noyes Slough	Fairbanks	Sediment, Petroleum Products, Debris	Urban Runoff	This waterbody was placed on the 1994 Section 303d list-no additional information has been evaluated by ADEC since then. Numerous water quality violations have been reported. These violations are a result of debris dumped into the slough. Urban run-off is also a problem. Snow dumps located adjacent to the slough contain waste (oil, grease, litter, anti-freeze, and salts) which is caused from the removal of snow from city streets and parking lots. Melting snow carries these pollutants into the waterbody.
10301-014	Pederson Hill Creek	Juneau	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform-no additional information has been evaluated by ADEC since then.
30101-602	Popof Strait	East Aleutians Borough	Seafood Residue	Seafood Processor	This waterbody has NOT been previously listed as a Section 303d waterbody. Information provided by the Aleutians East Borough, and verified by ADEC staff, included citizen complaints, photographs, and other information to indicate that persistent exceedances of "seafood residue" are occurring from a seafood processor operating adjacent to the waterbody. The seafood processor is under an EPA compliance order to submit a plan that adequately addresses the discharge of oily water or oily waste, grease, foam, or floating solids on the water surface that can accumulate on the shoreline.

SECTION 303(d) LISTED WATER QUALITY-LIMITED WATERBODIES
Tier I

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
50404-001	Red Dog Creek - Ikalukarok Creek	Near Red Dog Operation	Total Dissolved Solids	Mining	This waterbody was placed on the 1994 Section 303d list for total dissolved solids (TDS). A mining operation, owned by Cominco Corporation, is currently in operation on Red Dog Creek. Cominco requested a site-specific criterion for TDS in October 1995. Cominco intends to do field and lab studies this summer to determine if the TDS effluent has an adverse effect on aquatic life. There is data that fish are thriving in lower Red Dog Creek. This waterbody may need a waterbody assessment to validate the water quality issues, the feasibility of a site-specific criterion for the TDS parameter, and determine if additional controls are necessary for the mining operation.
30102-409	Red Lake - Anton Road Ponds	Kodiak	Debris, Metals, Petroleum Products	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for metals, debris, and petroleum products-no additional information has been evaluated by ADEC since then. Based on a 1992 memorandum released by ADEC-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 two other small ponds near Anton Road. These two ponds are highly colored by bright orange-red iron precipitates caused by the oxidation of the leachate. Lake sediment sample were found to contain 8.6% iron. Chemical pollutants have been documented at low levels in the lake and in the bottom sediments. A complaint letter indicates that debris is being deposited into the Anton Road Pond. This debris includes old refrigerators, 55 gallon drums, scrap steel, etc.
10202-602	Rowan Bay	Kuiu Island	Debris	Log Transfer Facility	This waterbody was placed on the 1994 Section 303d list for debris (bark debris from deposition at a Log Transfer Facility (LTF)). A dive survey a few years ago showed an exceedance of the interim intertidal threshold bark accumulation level (as per Log Transfer Facility Siting, Construction, Operation and Monitoring\Reporting Guidelines, October 21, 1985). This waterbody requires another dive survey to determine the current extent of bark deposition.

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20401-020	Ship Creek - Glenn Hwy. Bridge Down to Mouth	Anchorage	Fecal Coliform, Petroleum Products	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform, biological community alteration, and petroleum hydrocarbons-no additional information has been evaluated by ADEC since then. Based on the fecal coliform monitoring data provided by the Municipality of Anchorage the water quality criteria for drinking water and contact recreation were exceeded at various times between 1989 and 1994. EPA has also established a superfund site adjacent to Ship Creek. Petroleum products floating on ground water are moving from the site towards Ship Creek which threatens the waterbody. A report completed for ADEC indicates that the macroinvertebrate community has been altered/degraded. This waterbody will require a waterbody assessment to determine the source of the fecal coliform, extent of the ground water contamination, other water quality issues and cost-effective remediation measures.
10102-603	Shoemaker Bay	Wrangell	Debris	Industrial	This waterbody was placed on the 1994 Section 303d list for habitat modification and debris-no additional information has been evaluated by the ADEC since then. A U.S. Fish and Wildlife Service report titled Some Effects of Industrial Development and Marine Log Storage on Benthic Marine Organisms at a Sawmill Near Wrangell, Alaska, January 1994 determined the intertidal habitat for marine macroinvertebrates has been seriously degraded from a combination of factors including operation of the sawmill, marine log storage, and woodwaste disposal on adjacent uplands. The habitat degradation, partially attributable to log bark deposition from the marine log storage area, has contributed to a decline in numbers and biomass of marine macrobenthic fauna, an adverse effect to the aquatic life designated use. The report also concludes that it is probable that petroleum product spills and organic leachates may also be contributing to the sparsity of marine organisms at the mill study site compared to the control site. The mill operation is owned by Alaska Pulp Corporation and ceased operations in 1994. An on-site field inspection coordinated with APC representatives should occur Summer 1996 to begin the waterbody assessment process.
10303-601	Skagway Harbor - Pullen Creek (Lower Mile)	Skagway	Metals	Industrial	This waterbody was placed on the 1994 Section 303d list for metals-no additional information has been evaluated by ADEC since then. An undated draft report from the U.S. Fish and Wildlife Service titled Trace Metals Contamination at an Ore Loading Facility in Skagway, Alaska indicated that trace metals contamination are due to an ore loading facility in Skagway. Elevated levels of lead, zinc, cadmium, copper, and mercury in marine sediments were found to exceed the values of the control area. Additionally, infauna found in the marine sediments were much reduced and diversity was correlated with the concentration of lead and zinc in the sediment; an adverse effect to the aquatic life designated use.

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
40510-101	Slate Creek	Denali National Park	Turbidity	Mining	This waterbody was placed on the 1994 Section 303d list for turbidity and habitat modification. There is no water quality standard for habitat modification unless correlated to an effect to a designated use. Insufficient information in the file on effects to designated uses from habitat modification. A State Division of Mining memorandum dated March 5, 1996 requests waterbody be de-listed since data to support listing is more than a decade old, no mining has been allowed near the stream for fourteen years, and revegetation is likely to be complete or near so. A National Park Service (NPS) letter dated March 28, 1996 requests waterbody remain on 303d list because stream is impaired from past placer mining disturbances and restoration is required to stabilize channels, create functioning floodplains, and promote establishment of vegetation communities. NPS letter also states annual flooding causes erosion because of sparse vegetation as a result from the past mining activity. Other information used for the initial 1994 listing decision (an NPS Environmental Impact Statement), indicated that a turbidity problem exists during periods of high flow. This waterbody should have an interagency field inspection conducted Summer 1996 to help confirm water quality issues and appropriate restoration (if needed).
10103-602	Thorne Bay	Prince of Wales Island	Debris, Hydrogen Sulfide	Log Transfer Facility	This waterbody was placed on the 1994 Section 303d list for debris (bark and other woody material from the log transfer facility and log raft area), and hydrogen sulfide-no additional information has been evaluated by ADEC since then. Data shows that violations of the hydrogen sulfide standard have occurred, and that excess debris from the log transfer facility has accumulated on the bottom of Thorne Bay.
30102-607	Udagak Bay	Unalaska Island	Settleable solids	Seafood Processing	This waterbody was placed on the 1994 Section 303d list for seafood waste (settleable solids) - no additional information has been evaluated by ADEC since then. A near shore floating pollock processor has discharged seafood waste into Udagak Bay. Due to the poor flushing action in Udagak Bay, two piles of fish waste have accumulated at the bottom of the bay. This resulted in a violation of the water quality standards since the seafood general NPDES permit issued in 1989 did not provide for a zone of deposit. An earlier enforcement action was taken against the same seafood processors for waste that had accumulated on the shoreline, and for floating solids on the receiving water. Because of the discharge of fish meal effluent the dissolved oxygen content of the waterbody may also be affected.

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
10203-018	Wrinkleneck Creek - Swan Lake	Sitka	Solid Waste	Urban	This waterbody was placed on the 1994 Section 303d list for solid waste and habitat modification. There is insufficient information in the file to show an effect to a designated use from habitat modification. A 1994 water quality assessment indicated the waterbody from Baranof Street to Swan Lake is effected by urban development which has caused several problems in the area by way of urban runoff and solid waste debris including wood, oil tanks, waste metals, and plastics. A stream cleanup should occur on this waterbody by Summer 1996 coordinated by ADEC. An on-site inspection and a coordinated stream clean-up may address the water quality issues; if not a waterbody assessment is required to confirm pollutants and determine if additional controls are necessary.

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Tier II

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
30102-604	Akutan Harbor	Akutan Island	Settleable Solids, Dissolved Oxygen	Seafood Processing/ Waste	This waterbody was placed on the 1994 Section 303d list for settleable solids and dissolved oxygen. Additional water quality data since the 1994 listing decision has been made available and evaluated by ADEC. An evaluation of this data indicates that dissolved oxygen and settleable solids exceedances continue in the waterbody. A waterbody assessment and TMDL have been prepared to address the water quality issues within this waterbody. The associated revised NPDES permit with TMDL additional controls is currently being finalized.
40402-001	Birch Creek Drainage - Upper Birch Creek - Eagle Creek - Golddust Creek	North of Fairbanks	Turbidity	Placer Mining	This waterbody was placed on the 1994 Section 303d list for turbidity as a result of placer mining activity within the drainage. This waterbody has a completed waterbody assessment that confirmed the pollutant, pollutant source, and that existing controls are expected to be sufficient to address the turbidity issue. A waterbody recovery plan has been prepared and submitted to EPA for technical review. Although the recovery plan does not include a "TMDL, in the context of a wasteload or load allocation for a given parameter, it is the state's position that the waterbody went through the TMDL process and could therefore be approved by EPA as a "TMDL process" document to satisfy court-ordered "TMDL's."
40501-001	Cabin Creek	Nabesna	Manganese	Mining	This waterbody was NOT on the 1994 Section 303d list. This waterbody was nominated by EPA for 1996 Section 303d listing. An EPA contractor (URS Consultants) prepared a site investigation report, Site Inspection Report for the Nabesna Mine, Nabesna Alaska, Sept. 26, 1995. ADEC evaluated this additional information and concluded that the manganese state water quality criteria has been significantly exceeded and is likely to be correlated to the past mining activity in the watershed. The site investigation report qualifies as a waterbody assessment report. Coordination with the National Park Service, Division of Mining and private landowners is needed to determine a feasible and appropriate waterbody recovery plan for the manganese parameter.
20401-004	Campbell Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The Campbell Creek water quality assessment completed in June 1994 identified several parameters of concern, i.e. temperature, turbidity, zinc, lead, but concluded that Campbell Creek was water quality limited for fecal coliform only. The waterbody assessment also determined that a TMDL for fecal coliform is not necessary at this time since existing controls, to be specified in the Municipality of Anchorage pending stormwater NPDES permit, will address the parameter.

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20401-402	Campbell Lake	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The Campbell Creek water quality assessment, completed in June 1994, included an assessment of Campbell Lake. The assessment identified several parameters of concern, i.e. fecal coliform, lead and zinc, but concluded that Campbell Lake was water quality limited for fecal coliform only. The waterbody assessment also determined that a TMDL for fecal coliform is not necessary at this time since existing controls, to be specified in the pending Municipality of Anchorage stormwater NPDES permit, will address the parameter.
20401-003	Chester Creek	Anchorage	Fecal Coliform	Urban Runoff, Industrial, Septic Tanks	This waterbody was placed on the 1994 Section 303d list for fecal coliform. In April 1993, a water quality assessment was completed on the Chester Creek drainage which identified several parameters of concern for Chester Creek, but the assessment concluded that the waterbody is water quality limited for fecal coliform only. The waterbody assessment also determined that a TMDL for parameters of concern is not necessary since existing controls, to be specified in the pending Municipality of Anchorage stormwater NPDES permit, will address the parameter.
10301-005	Duck Creek	Juneau	Dissolved Oxygen, Debris, Metals, Fecal Coliform, and Turbidity	Urban Runoff, Landfill, Road Runoff, Land Development	This waterbody was placed on the 1994 Section 303d list for dissolved oxygen, debris, metals, fecal coliform, turbidity, petroleum aromatic hydrocarbons, and habitat modification. A water quality assessment draft has been completed for Duck Creek and submitted to EPA for technical review. ADEC identified the waterbody as being water quality limited for all of the water quality criteria parameters except petroleum aromatic hydrocarbons (hydrocarbon data is insufficient to show persistent exceedances of the criteria). Additional concerns identified in the assessment include hydrologic effects to the stream from habitat modification, sedimentation, and cumulative effects to aquatic life. There is a Duck Creek Advisory Group that is looking at waterbody recovery alternatives. The waterbody requires a waterbody recovery plan that addresses all the pollutant parameters. (Note: habitat modification issues will be addressed through existing permit requirements for new construction and potential restoration options to address all the water quality issues).

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20302-601	Eagle River Flats	Fort Richardson	Phosphorous	Military Base Operations	This waterbody was NOT on the 1994 Section 303d list. This waterbody was nominated by EPA superfund cleanup staff for 1996 Section 303d listing. An EPA consultant, CH2MHill prepared a report, Eagle River Flats - Comprehensive Evaluation Report, 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 area. Several remediation projects have occurred to help determine eventual remediation feasibility. A final remediation alternative, specified in a record of decision, is expected by the end of 1998. Final remediation activities are expected to occur through 1999 or 2000.
20401-005	Fish Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform and turbidity. A waterbody assessment concluded the waterbody was water quality-limited only for fecal coliform. The waterbody assessment also concluded a TMDL for the pollutant parameter is not necessary since existing controls, to be specified in the pending Municipality of Anchorage NPDES stormwater permit, will address the parameter issue.
40506-009	Garrison Slough	Eielson Air Force Base	Polychlorinated Biphenyls	Military Base/ Operations	This waterbody was placed on the 1994 Section 303d list for polychlorinated biphenyls (PCBs). Information in the file indicates sediment and fish samples from the slough contain elevated levels of PCBs. EPA's Superfund Division is presently deciding which clean-up method is most feasible. The schedule for clean-up will be established after the Record of Decision is signed (expected by Summer 1996). The signed Record of Decision will provide the enforceable waterbody recovery plan for addressing the PCB issue and will include the method for waterbody recovery.
0509-001	Goldstream Creek	Fairbanks	Turbidity	Placer Mining	This waterbody was placed on the 1994 Section 303d list for turbidity from placer mining. A waterbody assessment has been completed that confirmed the pollutant, pollutant source, and determined that existing controls were sufficient to address the turbidity issue. A waterbody recovery plan has been prepared and submitted to EPA for technical review. Although the recovery plan does not include a "TMDL," in the context of a wasteload or load allocation for a given parameter, it is the state's position that the waterbody went through the TMDL process and could therefore could be approved by EPA as a "TMDL" process document to satisfy court-ordered "TMDL's."

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Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
30203-001	King Salmon Creek	King Salmon	Petroleum Hydrocarbons, Metals, Pesticides	Landfill, Fuel Storage	This waterbody was placed on the 1994 Section 303d list for petroleum hydrocarbons, metals, and pesticides. Based on information from EPA's Comprehensive Environmental Response Compensation Liability Act (CERCLA) group, the waterbody is water quality-limited for petroleum hydrocarbons, metals, and pesticides. This waterbody is presently being addressed through an agreement between the ADEC, the EPA and the U.S. Air Force. Waterbody assessment studies have been done for the waterbody. A proposed remediation plan for the pollutants has been drafted.
20401-017	Little Campbell Creek	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The water quality assessment for the Campbell Creek Drainage indicates that Little Campbell Lake is water quality-limited only for fecal coliform. The waterbody assessment also determined that a TMDL is not necessary since existing controls, to be specified in the Municipality of Anchorage pending stormwater NPDES permit, will address the pollutant parameter.
20505-409	Lake Lucille	Wasilla	Dissolved Oxygen	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for dissolved oxygen and nutrients. The Lake Lucille water quality assessment reports the lake is eutrophied, because it has nuisance growths of aquatic plants and severe depletion of dissolved oxygen under winter ice. Nitrogen and phosphorous are the "nutrients" of concern because of the historical input of these nutrients from the approximate 100 residences that occupy the lake shore. However, since the City of Wasilla has responded by constructing a municipal sewer system that serves most if not all of the lake residences, the nutrient source has been essentially eliminated. The waterbody requires a waterbody recovery plan to address the dissolved oxygen issue.
30204-002	Red Fox Creek	King Salmon	Petroleum Hydrocarbons, Metals	Landfill, Fuel Storage	This waterbody was placed on the 1994 Section 303d list for petroleum hydrocarbons and metals. Data/information provided by EPA's Comprehensive Environmental Response Compensation Liability Act (CERCLA) group show that the waterbody is water quality-limited for petroleum hydrocarbons and metals. The waterbody is being addressed through an agreement between the ADEC, EPA, and the U.S. Air Force. Water quality assessment studies have been done for the waterbody and a remediation plan has been proposed.

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Tier II

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
10203-601	Silver Bay	Sitka	Dioxin, Sludge, Dissolved Oxygen	Industrial	This waterbody was placed on the 1994 Section 303d list for dioxin, sludge, and dissolved oxygen. Based on information presented in a report titled Final Expanded Site Inspection Report, Alaska Pulp Corporation, Sitka, Alaska, Feb. 1995, water quality violations for dioxins occurred. Based on the June 1993 Water Quality Assessment, the pollutant parameters of concern included sludge and dissolved oxygen. The water quality issues are currently being addressed through an ADEC remedial investigation (similar to a CERCLA investigation) that is being conducted at the mill facility and adjacent marine waters. A Record of Decision that outlines specific remedial alternatives is expected by Fall 1997 with identified remediation activities expected to be completed by 1999.
20401-419	University Lake	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The Chester Creek Drainage Water Quality Assessment, completed in April 1993, determined that the waterbody is water quality-limited for only fecal coliform. The waterbody assessment also concluded that a TMDL for the pollutant parameter is not necessary since existing controls, to be specified in the pending Municipality of Anchorage NPDES stormwater permit, will address the pollutant parameter.
10102-601	Ward Cove	Ketchikan	Sediment, Dissolved Oxygen, Color, Toxic Substances	Industrial	This waterbody was placed on the 1994 Section 303d list for sediment, dissolved oxygen (DO), color, and toxic substances. Based on the May 27, 1994 TMDL for Ward Cove and other additional supporting information, i.e. discharge monitoring reports, Ward Cove is water quality-limited for dissolved oxygen, sediment, color and toxicity.
20401-421	Westchester Lagoon	Anchorage	Fecal Coliform	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for fecal coliform. The Chester Creek Drainage Water Quality Assessment, April 1993, identified Westchester Lagoon as being water quality-limited only for fecal coliform, however, there are water quality concerns related to iron, turbidity and petroleum products. The waterbody assessment also concluded that a TMDL for the pollutant parameters is not necessary since existing controls, to be specified in the pending Municipality of Anchorage NPDES stormwater permit, will address the pollutant parameters.

APPENDIX B

WATER QUALITY-LIMITED WATERBODIES

NOT SECTION 303(d) LISTED

WHICH WILL BE

TRACKED and MONITORED

and

WATERBODY-SPECIFIC MATRIX (TIER III)

WATER QUALITY-LIMITED WATERBODIES NOT SECTION 303(d) LISTED WHICH WILL BE TRACKED AND MONITORED Error! Bookmark not defined.

TIER III **Water quality-limited waterbodies which have implemented waterbody recovery plans (such as approved TMDLs that are in the process of being implemented through permits or other control mechanisms).**
H-South Unalaska Bay*
H-Lemon Creek*
H-Vanderbilt Creek *
M-Hammer Slough
M-Nearshore Beaufort Lagoons
M-Captain□s Bay
L-Exxon Valdez Waterbodies
L-Fubar Creek
L-Gibson Cove
L-Sawmill Creek

* = Waterbodies with approved TMDLs (Total Maximum Daily Load) for a specified pollutant.

H = High Priority
M = Medium Priority
L = Low Priority

ALASKA'S WATER QUALITY-LIMITED WATERBODIES NOT SECTION 303(d) LISTED

Tier III

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
30102-605	Captain's Bay	Unalaska Island	Settleable Solids	Seafood Processing	This waterbody was placed on the 1994 Section 303d list for settleable solids because the data used for the 1994 list indicated that the established zone of deposit for the discharger was being exceeded. Recent monitoring data evaluated by the ADEC has resulted in the conclusion that the discharger is currently meeting zone of deposit requirements and the waterbody is recovering. However, because of the extent of the processing activity within Captain's Bay, this waterbody still qualifies as water quality-limited (water quality standards may be exceeded within the next two years), and will be tracked and monitored by ADEC and EPA. However, if monitoring continues to indicate compliance with the water quality standards, this waterbody will not be "water quality-limited" by the next listing cycle and will be placed on Tier IV at that time.
N/A	Exxon Valdez Waterbodies	Prince William Sound/Alaska Peninsula	Petroleum Products	Exxon Valdez Crude Oil Spill	The Exxon Valdez affected beaches and adjacent marine waters were not placed on the 1994 or 1996 Section 303d list because a TMDL process would have unnecessarily duplicated efforts of the Exxon Valdez Trustee Council and restoration projects specified in the Exxon Valdez Restoration Plan. The restoration plan, which includes the phases of injury assessment, restoration, replacement, enhancement of natural resources, and acquisition of equivalent resources, provides long-term guidance for restoring the natural resources and shorelines injured by the oil spill. Scientists and agency representatives funded through approved restoration funds will continue to track and monitor recovery of the natural resources impacted by the oil spill.
10103-031	Fubar Creek	Prince of Wales Island	Sediment	Timber Harvest	Fubar Creek was not placed on the 1994 or 1996 Section 303d list because the U.S. Forest Service (USFS) provided documentation that a decision had been made to defer timber harvest for five to eight years in the watershed and the USFS has been active in stabilizing land disturbances from both past management practices and natural events. The USFS and ADEC will continue to monitor the recovery of this waterbody.
20701-605	Gibson Cove	Kodiak	Seafood Residue	Seafood Processing	Gibson Cove was not placed on the 1994 or 1996 Section 303d list because information from EPA's National Primary Discharge Elimination Systems (NPDES) group reported that all seafood waste effluent has been diverted away from Gibson Cove. With the elimination of discharges into Gibson Cove, this waterbody is expected to recover with no additional controls.

ALASKA'S WATER QUALITY-LIMITED WATERBODIES NOT SECTION 303(d) LISTED

Tier III

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
0202-006	Hammer Slough	Mitkof Island	Sediment	Urban Gravel Mining	This waterbody was placed on the 1994 Section 303d list for sediment. The Alaska Department of Fish and Game (ADF&G) has indicated that excessive siltation was occurring in the Slough as a result of runoff from the state rockpit, city dirt roads and the city yard. A March 1996 inter-agency site inspection of the watershed with representatives from ADEC, ADFG, City of Petersburg, and DOT/PF determined pollutant sources, responsible parties, and a remediation schedule to be completed by Summer 1996. Existing controls are expected to meet water quality standards by Summer 1996.
10301-001	Lemon Creek	Juneau	Turbidity, Sediment	Urban, Gravel Mining	This waterbody was placed on the 1994 Section 303d list for turbidity, sediment, and habitat modification. A waterbody recovery plan that included a TMDL was prepared for this waterbody during Summer 1995. The TMDL was approved by the EPA. Waterbody recovery plan implementation began during Fall 1995.
60402-601	Nearshore Beaufort Lagoons	Sag River to Simpson Lagoon	Temperature, Salinity	Causeway	This waterbody was placed on the 1994 Section 303d list for temperature and salinity. Various study reports and information from the EPA Alaska Operations Office indicate the hydrology and water quality (temperature and salinity) of the Nearshore Beaufort Sea is being affected by the causeways that may also have adverse effects to anadromous fish. Mitigation to correct problems with water quality and fish passage were agreed upon in the Negotiated Settlement Agreement for Endicott and West Dock Causeways between the U.S. Army Corps of Engineers and the permit holders (Public Notice 91-1). This mitigation described more specifically in permit modification FF 820562 consists 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. This monitoring is being done on a continuous basis by a BP Exploration (Alaska) Inc. consulting firm.
10301-003	Sawmill Creek	Haines	Debris	Urban	This waterbody was not placed on the 1994 Section 303d list because initial waterbody information indicated the primary water quality issue was the need for a stream clean-up. The City of Haines provided ADEC with information on its clean-up efforts last year. Stream flow improvements will occur Summer 1996 by the installation of a special culvert in the lower reach of the waterbody. Hydro-seeding will also occur Summer 1996 for some streambank reaches that need to be re-vegetated.

ALASKA'S WATER QUALITY-LIMITED WATERBODIES NOT SECTION 303(d) LISTED

Tier III

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
30102-603	South Unalaska Bay	Unalaska Island	Settleable Solids, Dissolved Oxygen	Seafood Processing/ Waste	This waterbody was on the 1994 Section 303d list for both settleable solids and dissolved oxygen. EPA developed and approved a TMDL in 1994, and is in the process of issuing revised seafood processing permits to implement TMDL controls. Seafood processors discharging into South Unalaska Bay have already begun implementing TMDL controls. Recent water quality data evaluated by ADEC staff indicates that the waterbody is improving substantially compared to previous years. However, this waterbody still qualifies as being water quality-limited because of the magnitude of seafood processing within the waterbody and the need to continue evaluating the monitoring data the next two years before a determination is made that this waterbody is no longer water quality- limited. South Unalaska Bay will be tracked and monitored by ADEC and/or EPA to ensure that waterbody recovery continues and the seafood processors are fully implementing their revised permit requirements.
10301-017	Vanderbilt Creek	Juneau	Turbidity, Debris, Sediment	Urban	This waterbody was placed on the 1994 Section 303d list for turbidity, debris, sediment, and habitat modification. There is insufficient information in the file to correlate habitat modification with effects to designated uses. A waterbody recovery plan that included a TMDL was prepared during Summer 1995. The TMDL was approved by EPA. Implementation of the waterbody recovery plan began during the Fall 1995.

APPENDIX C

EVALUATED WATERBODIES NOT WATER QUALITY-LIMITED

WHICH REQUIRE NO FURTHER ACTION AT THIS TIME

and

WATERBODY-SPECIFIC MATRIX (TIER IV)

EVALUATED WATERBODIES NOT WATER QUALITY-LIMITED WHICH REQUIRE NO FURTHER ACTION AT THIS TIME

TIER IV **Waterbodies which are not water quality-limited that require no further action at this time.**
Cherry Hill Creek
Lost Harbor
South/Mid-Salt Lagoons

WATERBODIES THAT REQUIRE NO FURTHER ACTION AT THIS TIME

Tier IV

Alaska ID Number	Waterbody	Location	Pollutant Parameters	Pollutant Sources	Narrative Explanation
20401-001	Cherry Hill Creek	Anchorage	Petroleum Products, Nutrients	Urban Runoff	This waterbody was placed on the 1994 Section 303d list for petroleum products and nutrients. It should be noted that the waterbody is not considered a water source, but instead is a stormwater receptor/collection/discharge system. As such it has received some level of pollutants, including petroleum and PCBs. Removal and control of these contaminants has been addressed in CERCLA work undertaken by Elmendorf AF B. and ADEC. ADEC contaminated site staff indicate this work has satisfied ADEC's concerns. A review of the file has shown the decision to list the waterbody for "nutrients" was based on insufficient information.
30102-605	Lost Harbor	Aleutians	Settleable Solids	Seafood Processing	While meeting water quality-limited criteria in 1994, this waterbody was NOT placed on the 1994 or 1996 Section 303d list because EPA has not authorized any discharges into this waterbody for several years. Since the source of any discharge was eliminated years ago and none currently exists, the best professional judgement of ADEC staff is that the waterbody should not be considered water quality-limited in 1996.
60202-401	South/Mid Salt Lagoons	Barrow	Sewage, Solid waste	Sewage Treatment Facility	This waterbody was placed on the 1994 Section 303d list for sewage and solid waste. Information since the 1994 listing verifies that the lagoons serve as a permitted sewage lagoon facility to treat sewage for the Barrow community. ADEC regulations in 18 AAC 70 allow sewage treatment facilities to exceed state water quality standards within the boundaries of the treatment works.