Fact Sheet

NPDES Permit Number: AK-002137-7
Date: July 23, 2007
Public Notice Expiration Date: August 23, 2007

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The U.S. Environmental Protection Agency (EPA) Plans To Reissue A Wastewater Discharge Permit To:

City of Kenai Wastewater Treatment Plant
1450 Kenai Avenue
Kenai, Alaska 99611-7794

and
The State of Alaska Proposes to Certify the Permit and Issue a Consistency Determination

EPA Proposes NPDES Permit Reissuance.

EPA proposes to reissue a *National Pollutant Discharge Elimination System* (NPDES) Permit to the City of Kenai. The draft permit sets conditions on the discharge--or release--of pollutants from the Kenai wastewater treatment plant to Cook Inlet. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a description of the current discharge and current biosolids practices
- a listing of past and proposed effluent limitations, schedules of compliance, and other conditions
- a map and description of the discharge location and the sewage disposal or use locations
- detailed technical material supporting the conditions in the permit

The State of Alaska Proposes Certification and Consistency Determination.

The Alaska Department of Environmental Conservation (ADEC) intends to certify the NPDES permit for the City of Kenai Wastewater Treatment Facility under section 401 of the Clean Water Act. The permit may change after review and draft certification by ADEC.

Prior to issuance of the permit, the City of Kenai shall submit a Coastal Project Questionnaire to the Alaska Coastal Management Program for a consistency determination.

Public Comment.

EPA will consider all substantive comments before issuing the final permit. Those wishing to comment on the draft permit may do so in writing by the expiration date of the Public Notice. A request for public hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance.

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/offices/water/npdes.htm.

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-1774 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Fact Sheet and draft permit are also available at:

EPA Alaska Operations Office, Room 537
Federal Building
222 West 7th Avenue
Anchorage, Alaska 99513-7588.

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I. APPLICANT

Kenai Wastewater Treatment Plant
NPDES Permit No. AK-002137-7

Facility Location:
1450 Kenai Avenue
Kenai, Alaska 99611

Mailing Address:
210 Fidalgo Avenue, Suite 200
Kenai, Alaska 99611

Facility contacts: Fred Macvie, WWTP Supervisor
Jack La Shot, Public Works Manager

II. FACILITY ACTIVITY

The City of Kenai owns, operates, and maintains a complete mix modification of an activated sludge secondary treatment plant. The facility discharges treated municipal wastewater to Cook Inlet and sludge to the Soldotna landfill. The facility receives no significant industrial discharge, and the system has no combined sewers. The facility serves a resident population of 3600. As the City of Kenai is a tourist area, though, actual population is higher during summer months. Details about the wastewater treatment process are included in Appendix A. The map in Appendix B shows the location of the treatment plant and discharge.

III. RECEIVING WATER

The applicable water quality standards are those adopted by the State of Alaska Department of Environmental Conservation (ADEC) at 18 AAC 70. State water quality standards protect Cook Inlet for the marine use classifications 18 AAC 70.020.a.(2) A-D. These classifications protect Cook Inlet for the beneficial uses of aquaculture, seafood processing, industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, other aquatic life, and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life.

IV. FACILITY BACKGROUND

The Kenai wastewater treatment plant was first issued an NPDES discharge permit on December 14, 1973. The current permit expired on November 1, 2004. The EPA received an updated permit application from the City of Kenai dated May 7, 2004. The application was returned to the City for additional information. The completed application was reviewed and accepted by EPA on August 31, 2004, and the permit was administratively extended.

Design flow for the facility is 1.330 mgd. The NPDES application shows that the facility's annual average daily flow for the past three years was 0.573 mgd. Reviews of the discharge monitoring reports also reveal that the facility has generally reported compliance with its 1999 permit effluent limits. Discharge monitoring reports are forms the facility uses to report results of self-monitoring, including effluent testing results.

V. EFFLUENT LIMITATIONS

EPA followed the Clean Water Act, state and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control (TSD)* to develop the proposed effluent limits. Appendix C provides the basis for the development of effluent limits.

In general, the Clean Water Act requires that the effluent limits for particular pollutants are the more stringent of the *technology-based* or *water quality-based* limits. Technology-based limits are set based on the level of treatment that is achievable using available technology. Water quality-based limits are required for pollutants that are discharged at levels that could cause or contribute to an exceedance above the state water quality standards in the Cook Inlet. Water quality-based effluent limits are only required if the pollutants are discharged at levels which cause or have the reasonable potential to cause or contribute to exceedances of the Alaska Water Quality Standards. The determination of the need for water quality-based limits is presented in Appendix C.

In addition to water quality-based limitations for pollutants that could cause or contribute to exceedances of standards, EPA must consider the state's antidegradation policy (18 AAC 70.010). This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. The draft permit will result in no increases in the authorized pollutant loadings to the Cook Inlet. Therefore, the draft permit is consistent with Alaska's antidegradation policy.

The draft permit includes both technology-based and water quality-based limits (See Appendices E and F). For wastewater treatment plants, technology-based limits cover three parameters: five-day Biochemical Oxygen Demand (BOD_5), total suspended solids (TSS), and pH. In addition, this permit includes water quality-based limits for fecal coliform and total residual chlorine. Table V-1 presents the effluent limits for the draft permit. For comparison purposes, the table also shows the effluent limitations in the 1999 permit.

Table V-1: Kenai Final Effluent Limitations

Parameter	Monthly Average Limit		Average Weekly Limit		Daily Maximum Limit	
	Draft	1999	Draft	1999	Draft	1999
BOD_5[1]	30 mg/L 325 lbs/day	30 mg/L 325 lbs/day	45 mg/L 488 lbs/day	45 mg/L 488 lbs/day	60 mg/L 650 lbs/day	60 mg/L 650 lbs/day
TSS[1]	30 mg/L 325 lbs/day	30 mg/L 325 lbs/day	45 mg/L 488 lbs/day	45 mg/L 488 lbs/day	60 mg/L 650 lbs/day	60 mg/L 650 lbs/day
pH, standard units	---	---	---	---	6.5 - 8.5	6.5 – 8.5
Fecal Coliform [2,3], #FC/100 mL	200	200	400	400	774	774
Total Residual Chlorine[4]	0.059 mg/L 0.639 lbs/day	0.059 mg/L 0.639 lbs/day		---	0.023 mg/L 0.25 lbs/day	0.023 mg/L 0.25 lbs/day

1 The average monthly percent removal shall be greater than 85%.
2 Based upon a 5-tube decimal dilution test or membrane filter technique, the fecal coliform 30-day average shall not exceed 200 FC/100 mL or a 7-day average of 400 FC/100 mL.
3 Not more than 10% of the samples taken in a 30-day period shall exceed 774 FC/100 mL.
4 Based upon amperometric or DPD methods, the chlorine residual shall be below the detectable level.

The draft permit requires that discharges be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance. It also prohibits discharges of waste streams that are not part of the normal operation of the facility, as reported in the permit application.

Fecal coliform limits were based on the more stringent of the water quality-based or ADEC technology-based limitations from 18 AAC 72.

VI. MONITORING REQUIREMENTS

A. Effluent Monitoring.

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) requires that monitoring be included in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The Permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) to EPA. Table VI-1 presents the proposed monitoring requirements based on the minimum sampling necessary to adequately monitor the facility's performance. For comparison purposes, the table also shows the monitoring requirements in the 1999 permit.

TABLE VI-1. Monitoring Requirements for Outfall 001

Parameter	1999 Sample Frequency	Proposed Sample Frequency
Flow, mgd	continuous	continuous
BOD_5, mg/L[1]	2 days/week	2 days/week
TSS, mg/L[1]	3 days/week	3 days/week
Total Residual Chlorine, mg/L	6 days/week	6 days/week
pH, standard units[2]	6 days/week	6 days/week
Fecal Coliform Bacteria, #/100 mL	2 days/week	1 day/week
Enterococci, #/100 mL	---	1 day/week
Temperature, °C[3]	1/month for 1 year	1/month for 1 year
Total Ammonia, mg/L N[3]	1/month for 1 year	1/month for 1 year
Arsenic, µg/L	June and December	June and December[4]
Cadmium, µg/L	June and December	June and December[4]
Copper, µg/L	June and December	June and December[4]
Silver, µg/L	June and December	June and December[4]
Zinc, µg/L	June and December	June and December[4]
NPDES Application Form 2A Effluent Testing	---	3x/5years
Whole Effluent Toxicity	5 annual tests	2/year, June and December

1 Percent Removal Monitoring: The percent BOD_5 and TSS removal will be reported on each monthly DMR form.
2 The Permittee shall report the number and duration of pH excursions during the month with the DMR for that month.
3 Monitoring for this shall continue for 12 months after the effective date of the permit.
4 These parameters shall be analyzed as total recoverable **Effluent** metals shall be monitored in June and December during each year of the permit. **Influent** metals shall be monitored twice, once in June 2008 and once in December 2008.

B. Representative Sampling.

The requirement in the federal regulations regarding representative sampling (40 CFR 122.41[j]) has been expanded and specifically requires sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This provision is included in the draft permit because routine monitoring could easily miss permit violations and/or water quality standards exceedances that could result from bypasses, spills, or non-routine discharges. This requirement directs the Permittee to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

C. Ambient Monitoring.

The draft permit requires the Permittee to conduct monthly ambient (in-stream) monitoring upcurrent of outfall 001 from May through September 2007. Table VI-2 presents the draft monitoring requirements that will be used to verify the assumptions made in permit limit development regarding receiving water conditions. Based on the results of this study, EPA will determine whether to revise the permit limits when the permit is renewed.

The draft permit requires the Permittee to update the Quality Assurance Plan, which includes surface water monitoring protocol. The plan must address issues such as appropriate sampling location, temporal and spatial capability in the receiving water, appropriate sampling and analytical methods, analytical variability, and quality assurance/quality control for sampling and analysis. Monitoring stations previously approved by ADEC may be used during this permit cycle. Any changes to monitoring stations shall be approved by ADEC. The Permittee must report the results of the sampling with the application for permit renewal.

TABLE VI-2. Ambient Monitoring Requirements for Outfall 001

Parameter	Draft Sample Frequency
Enterococci	Monthly May – September 2008
Fecal Coliform Bacteria, FC/100 mL	Monthly May – September 2008

The ambient monitoring requirement for fecal coliform was retained for comparison with Alaska's current bacterial standards. Enterococci monitoring was added based on the recent EPA promulgation of Enterococci standards for marine recreational water use in Alaska.

D. Minimum Detection Levels

Water quality-based effluent limits (WQBELs) from the current permit have been incorporated into the draft permit to protect State water quality standards. The WQBEL for total residual chlorine falls below the capability of current analytical technology to detect and/or quantify the parameter. In order to determine compliance with the limit for total residual chlorine, EPA is establishing the minimum level (ML) as the quantification level for use in laboratory analysis.

EPA believes that the use of the ML as an analytical chemistry performance standard provides an unambiguous and rational means to demonstrate that the best chemistry available at the time of permit issuance is being used.

The ML is defined as the lowest concentration that gives recognizable signals and an acceptable calibration point. It is the equivalent concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes and processing steps have been followed. MLs are analyte- and method-specific and are established during the development and validation of the method. The ML for total residual chlorine is 0.100 mg/L.

The effluent limit for Total Residual Chlorine (TRC) is not quantifiable using EPA approved analytical methods. EPA will use 0.100 mg/L (the Minimum Level, ML) as the compliance evaluation level for chlorine.

EPA has developed new guidance for reporting on the DMR when effluent limits are below detection, as follows:

For purposes of reporting Total Residual Chlorine on the DMR, if a value is less than the MDL (0.010 mg/L), the permittee must report "<0.010 mg/L" on the DMR. If the value is between the MDL and the ML (between 0.010 and 0.100 mg/L), the permittee must report "<0.100 mg/L" on the DMR. If a value is greater than or equal to the ML (0.100 mg/L), the permittee must report and use the actual value.

For purposes of calculating TRC averages, zero may be assigned for values less than the MDL, and 0.010 mg/L may be assigned for values between the MDL and ML. If the average value is less than the MDL, the permittee must report "<0.010 mg/L," and if the average value is between the MDL and ML, the permittee must report "<0.100 mg/L."

E. Whole Effluent Toxicity.

Whole effluent toxicity tests are laboratory tests that use small vertebrate and invertebrate species, or plants, to measure the toxicity of an effluent. The effluent concentration that results in the death of 50% of test organisms during a 96-hour exposure determines the short-term (acute) toxicity. The highest effluent concentration that causes reduced growth or reduced reproduction of test organisms or plants during a 1-week (or other specified period of) exposure determines the long-term (chronic) toxicity.

Federal regulation 40 CFR 122.44(d)(1) requires that permits contain limits on whole effluent toxicity when a discharge has reasonable potential to cause or contribute to an exceedance of a water quality standard. Alaska water quality standards at 18 AAC 70.023 state that effluents discharged to a water may not impart chronic toxicity to organic organisms, expressed as 1.0 chronic toxic unit (TUc), at the point of discharge, or if ADEC authorizes a mixing zone in a certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. Based on the minimum dilution of 18, the discharged WET should be less than or equal to 18 TUc. Monitoring during the current permit cycle was very limited with a maximum result of 8.92 TUc. The available data set is still too limited to adequately determine reasonable potential, so the facility will be required to test two times per year, in June and December, using an echinoderm.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan Update.

Federal regulation 40 CFR 122.41(e) requires the Permittee to develop and keep onsite a Quality Assurance Plan to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The Permittee is required to update the current Quality Assurance Plan within 90 days of the effective date of the permit and to implement the plan by 180 days after the effective date of the permit. The Quality Assurance Plan shall consist of standard operating procedures the Permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained onsite and shall be made available upon request to EPA and ADEC.

B. Operation & Maintenance Plan Update.

Section 402 of the Clean Water Act and federal regulations 40 CFR 122.44(k)(2) and (3) authorize EPA to require *best management practices*, or BMPs, in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility Operation & Maintenance (O&M) plans. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the Kenai WWTP to update its O&M plan, if new practices have been developed, within 180 days of permit issuance. Specifically, the Permittee must consider spill prevention and control, optimization of chlorine and other chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system, and water conservation. To the extent that any of these issues have already been addressed, the Permittee need only reference the appropriate document in its O&M plan. The O&M plan shall be revised as new practices are developed. The plan shall be retained onsite and shall be made available upon request to EPA and ADEC.

C. Municipal Sewage Sludge (Biosolids) Management.

The City of Kenai Wastewater Treatment Plant's biosolids are primarily domestic. The biosolids are disposed of in the Soldotna Landfill.

D. Additional Permit Provisions.

1. Boilerplate: Sections II, III, and IV of the draft permit contain "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all Permittees and must be included in NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

2. Requirements continued based on the current permit's ADEC pre-certification: In its pre-certification of the current permit, dated July 19, 1999, ADEC added a requirement for the permittee to place sign(s) near the mixing zone and outfall lines, which the permittee did. The sign(s) were to contain information about the mixing zone, notification that treated wastewater is being discharged, as well as a number to contact for further information. ADEC also requested to be notified of violations, bypasses, plant changes as well as permit modifications. ADEC pre-certified a mixing zone with a minimum dilution of 18:1 for the Kenai discharge and ambient monitoring requirements for fecal coliform.

VIII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will not affect or is not likely to affect any of the threatened or endangered species in the vicinity of the discharge. See Appendix E for further details. EPA will provide a copy of the draft permit and fact sheet to NMFS and USFWS when it is public noticed. Any comments received from the agencies regarding ESA will be considered prior to the reissuance of this permit.

B. Essential Fish Habitat.

The Magnuson-Stevens Act requires federal agencies to consult with NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA has determined that issuance of this permit will not likely have an adverse effect on EFH in the vicinity of the discharge. Effluent limitations have been incorporated into the draft permit based on secondary treatment standards and are considered to be protective of overall water quality in the Cook Inlet based on criteria contained in the Alaska Water Quality Standards. EPA will provide NMFS with copies of the draft permit and fact sheet during the public notice period. Any comments received from NMFS regarding EFH will be considered prior to reissuance of this permit.

C. <u>State Certification and State Consistency Determination</u>.

Section 401 of the Clean Water Act requires EPA to seek *state certification* before issuing a final permit. The state certification process began consistent with the public notice process. As a result of the certification, the state may require more stringent permit conditions to ensure that the permit complies with water quality standards. The state also may or may not authorize the *mixing zone* used to calculate the effluent limitations in the draft permit. The reasonable potential and effluent limit calculations for fecal coliform, total residual chlorine, and metals are based on a dilution of 18:1, the state's previously proposed mixing zone for the Kenai wastewater treatment plant discharge.

The water quality-based limits in the draft permit are based on the dilution available in that mixing zone for fecal coliform and total residual chlorine. The draft permit has been sent to the state to begin the final certification process. If the state authorizes a different mixing zone in its final certification, the effluent limitations in the final permit will be recalculated based on the dilution available in the final mixing zone. If the state does not certify the mixing zone, EPA will recalculate the permit limitations based on meeting water quality standards at the point of discharge.

On September 20, 1996, this project was found to be consistent with the Alaska Coastal Management Program (ACMP).

Prior to issuance of the final permit, the City of Kenai will submit a Coastal Project Questionnaire to the ACMP for a new consistency determination. The NPDES permit will not be issued until a consistency determination has been made.

EPA believes that the modifications proposed from the previous permit to the draft permit are within the scope of the previous project.

D. Permit Expiration

This permit will expire five years from the effective date of the permit.

REFERENCES

AWWU 1999. Request for Site Specific Criteria for Point Woronzof Area of Cook Inlet. Submitted to Alaska Department of Environmental Conservation by the Municipality of Anchorage Water and Wastewater Utility (AWWU). Anchorage, AK, January 5, 1999.

EPA 1993. Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria. Memo from Martha Prothro to Water Management Division Directors. October 1, 1993.

EPA 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA/505/2-90-001.

EPA 1996a. EPA Region 10 Guidance For WQBELs Below Analytical Detection/Quantitation Level. NPDES Permits Unit, EPA Region 10, Seattle, WA, March, 1996.

Vasey Engineering 1997. Mixing Zone Analysis and Application Final Report, City of Kenai Wastewater Treatment Plant. Vasey Engineering, Seattle, WA, January 9, 1997.

LIST OF ACRONYMS

ADEC	Alaska Department of Environmental Conservation
AML	Average Monthly Limit
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BMP	Best Management Practices
BPJ	Best Professional Judgement
BOD	Biochemical Oxygen Demand
BPT	Best Practicable control Technology currently available
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CWA	Clean Water Act
DMR	Discharge Monitoring Report
CV	Coefficient of Variation
EPA	Environmental Protection Agency
LA	Load Allocation
MDL	Maximum Daily Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
ML	Minimum level
MSWLF	Municipal Solid Waste Landfill
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
RP	Reasonable Potential
TMDL	Total Maximum Daily Load
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA 1991)
TSS	Total Suspended Solids
ug/L	Micrograms per liter
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload Allocation
WQBEL	Water quality-based effluent limitation
WWTP	Wastewater treatment plant

APPENDIX A - KENAI WASTEWATER TREATMENT PLANT DESCRIPTION

Preliminary treatment

- Solids removal (bar screen)
- Dewatering and landfilling removed solids

Primary treatment

- Grit removal (grit chamber)
- Biological treatment (aeration basins)

Secondary treatment

- Biological treatment (aeration basins)
- Secondary clarification
- Chlorination with hypochlorite
- Bisulfite dechlorination

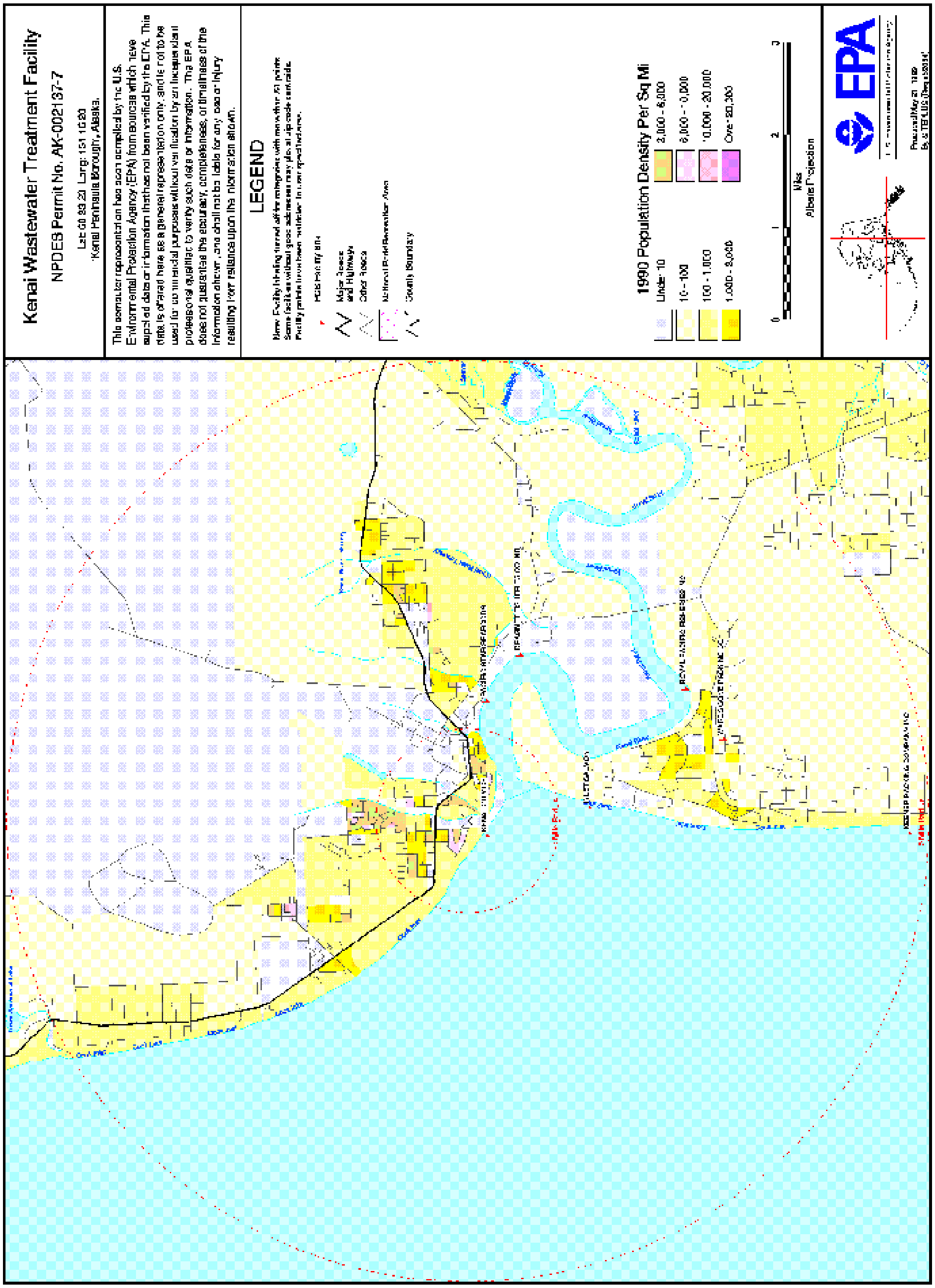
Discharge

- Effluent discharge rate is an annual average daily flow of 0.573 mgd over the last three years (from the NPDES application) and a maximum of 1.195 mgd
- Flow measurement and recording

Biosolids handling

- Polymer addition
- Dewatering (gravity table/belt filter press)

APPENDIX B – MAP OF KENAI WASTEWATER TREATMENT PLANT



APPENDIX C - BASIS FOR EFFLUENT LIMITATIONS

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations to determine which conditions to include in the draft permit.

In general, the EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any exceedances of the water quality standards in the receiving water. If exceedances could occur, EPA must include water quality-based limits in the permit. The draft permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent. The limits that EPA is proposing in the draft permit are found in Section V. of this Fact Sheet.

I. Technology-based Evaluation.

Section 301(b)(1)(B) of the CWA requires that discharges from publicly owned treatment works (POTWs) meet technology-based requirements defined as "secondary treatment" by July 1, 1977. The CWA initially focused on the control of "traditional" pollutants (conventional pollutants and some metals) through the use of "best practicable control technology currently available" (BPT). Section 301(b)(1)(3) of the CWA allowed a deadline for achieving BPT of March 31, 1989, under certain circumstances, but that deadline has also passed. Thus, permits issued after March 31, 1989, must include any conditions necessary to ensure that BPT is achieved.

Section 301(b)(2) of the CWA requires further technology-based controls on effluents. This section of the CWA requires that all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants by March 31, 1989. In no case may BCT or BAT be less stringent than BPT.

In many cases, BPT, BCT, and BAT limitations are based on effluent guidelines developed by EPA for specific industries. Where EPA has not yet developed guidelines for a particular industry or a particular pollutant, permit conditions must be established using best professional judgement (BPJ) procedures (40 CFR 122.43, 122.44, and 125.3). Secondary treatment requirements exist for BOD, TSS and pH, as discussed in Section C below.

II. Water Quality-based Evaluation.

In addition to the technology-based limits discussed above, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the CWA. This section requires the establishment of limitations in permits necessary to meet water quality standards by

July 1, 1977. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation at 40 CFR 122.44(d)(1) requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

EPA uses the approach outlined below when determining whether water quality-based limits are needed and when developing those limits.

- Determine the appropriate state adopted criteria.
- Determine whether there is "reasonable potential" to exceed the criteria.
- If there is reasonable potential to exceed the criteria, then develop a WLA.
- Develop effluent limitations, based on WLAs.

The following sections below provide a detailed discussion of these steps.

A. Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. The applicable criteria are determined based on the beneficial uses of the receiving water as identified in Section III of the Fact Sheet. For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses.

Table C-1 lists the most stringent criteria applicable to the discharge. These criteria are contained in Alaska's water quality standards (18 AAC 70) and the National Toxics Rule (40 CFR 131.36).

TABLE C-1 Applicable Marine Water Quality Criteria

Parameter	Aquatic Acute	Aquatic Chronic
Total Residual Chlorine, μg/L	13.0	7.5
Total Ammonia as N (μg/L)[1]	5450	820
Arsenic (μg/L)[2]	69	36

TABLE C-1 Applicable Marine Water Quality Criteria		
Parameter	**Aquatic Acute**	**Aquatic Chronic**
Cadmium (μg/L)[2]	40	8.8
Copper (μg/L) [2]	4.8	3.1
Lead (μg/L)[2]	210	8.1
Nickel (μg/L)[2]	74	8.2
Silver (μg/L) [2]	1.9	---
Zinc (μg/L) [2]	90	81

Note:
1 Calculated using methods from EPA 440/5-88-004 with salinity = 20 psu, temperature = 14 °C, and pH = 8.2. See Text tables 2 and 3, pp 31-31, "Ambient Water Quality Criteria for Ammonia (Saltwater) 1989"
2 Metals criteria are in the dissolved form.

B. Reasonable Potential Evaluation

To determine if there is "reasonable potential" to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares applicable water quality criteria to the maximum expected receiving water concentrations for a particular pollutant. If the expected receiving water concentration exceeds the criteria, there is "reasonable potential" and a water quality-based effluent limit must be included in the permit.

EPA has used the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this "reasonable potential" analysis for the Kenai wastewater treatment plant (WWTP). Reasonable potential (RP) calculations have been made for those pollutants with monitoring data and state criteria. The attached spreadsheet contains calculations evaluating reasonable potential for several pollutants present in the Kenai discharge. Effluent values in the spreadsheet were taken from the facility's DMRs and NPDES permit application.

The projected maximum receiving water concentration C_d is determined using the following mass balance equation.

$$C_d \text{ X } (Q_e + Q_u) = (C_e \text{ X } Q_e) + (C_u \text{ X } Q_u) \text{ where,}$$

C_d = receiving water concentration downstream of the effluent discharge
Q_d = receiving water flow downstream of the effluent discharge
C_e = maximum projected effluent concentration
Q_e = maximum effluent flow
C_u = upstream, or background, concentration of pollutant
Q_u = upstream flow

Because Kenai effluent discharges to a marine environment, upstream and downstream flows are not applicable. Instead, an appropriate mixing model is used to calculate the minimum dilution at critical conditions. Rearranging the basic mass balance equation, the predicted receiving water concentration (C_d) can be calculated as follows:

$$C_d = (C_e/\text{dilution}) + (C_u \text{ X dilution}).$$

1. Mixing zone/dilution

The dilution used to evaluate compliance with the water quality criteria (18:1) is based on a mixing zone application submitted by the City of Kenai and approved by the Alaska Department of Conservation (ADEC) for the current permit.

In accordance with state water quality standards, only ADEC may authorize mixing zones. If the State does not authorize a mixing zone in its 401 certification for the draft permit, the permit limits will be re-calculated to ensure compliance with the standards at the point of discharge.

2. Maximum projected effluent concentration

The maximum projected effluent concentration (C_e) is calculated based on the maximum reported effluent concentration and a multiplier (called a reasonable potential multiplier, RP) to account for uncertainty.

a. Determine the maximum effluent concentrations. The maximum effluent concentration was determined for ammonia, arsenic, cadmium, copper, lead, nickel, silver and zinc.

b. Determine the RP multiplier. The RP multiplier depends upon the number and variability of the effluent data points. The standard deviation (or scatter of the observation around the mean) of the data is expressed as a percentage of the mean or coefficient of variation (CV). The CV is a measurement of variability of the data. When there are not enough data (i.e., less than 10 data points) to reliably determine a CV, the TSD recommends using 0.6 as a default value.

The RP multiplier is calculated, assuming 99% confidence level and 99% probability basis (using equations from Section 3.3.2 of the TSD):

RP multiplier = C_{99}/C_x where,

$\sigma^2 = \ln(CV^2 + 1)$
$C_{99} = \exp(2.326\ \sigma - 0.5\ \sigma^2)$
C_x = percentile represented by highest concentration in the data base

c. Calculate the maximum projected effluent concentration (C_e).

C_e = (maximum effluent concentration from (1)) x (RP multiplier from (2)).

3. Determine reasonable potential

To determine reasonable potential, the maximum projected receiving water concentration (C^d) is compared to the most stringent water quality criteria.

The attached Spreadsheet 1 (page 28) contains reasonable potential calculations for ammonia, arsenic, cadmium, copper, lead, nickel, silver, and zinc. None of the parameters showed a reasonable potential to exceed the water quality criteria at the edge of the mixing zone, therefore, no water quality-based limits will be placed in the permit for these parameters.

For background metals concentrations, EPA used data available for Cook Inlet near Pt. Mackenzie (AWWU 1999). The maximum effluent flow is 1.33 mgd.

A. Wasteload allocation development

Once it has been determined that a water quality-based limit is required for a pollutant, the first step in developing a permit limit is development of a WLA for the pollutant. A WLA is the concentration (or loading) of a pollutant that the Permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water. For the current permit, EPA used a mixing zone-based WLA for chlorine. The requirement for chlorine limits have been retained in the draft permit.

Where the state authorizes a mixing zone for the discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentrations of the pollutant(s), and the water quality criteria. Because the different criteria (acute aquatic life, chronic aquatic life, human health apply over different time frames and may have different mixing zones, it is not possible to compare them directly to determine which criterion results in the most stringent limits. For example, the acute criteria are applied as a one-hour average and may have a smaller mixing zone, while the chronic criteria are applied as a four-day average and may have a larger mixing zone. The human health criteria are generally based on a 70-year exposure period. To allow for comparison, each criterion is statistically converted to a long-term average effluent concentration.

The attached Spreadsheet 2 (page 29) contains reasonable potential evaluations for pollutants detected in Kenai's discharge that have marine human health criteria – antimony, cyanide, manganese, nickel, and zinc. There was no reasonable potential for these parameters to exceed human health criteria at the edge of the chronic mixing zone; therefore, no limits based on human health will be placed in the permit.

B. Permit Limit Derivation

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability, sampling frequency, water quality standards, and the difference in time frames between the monthly average and daily maximum limits.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation. As with the reasonable potential calculation, when there is not enough data to calculate a CV, EPA assumes a CV of 0.6 for both monthly average and daily maximum calculations.

II. Effluent Limitations and Monitoring Requirements.

This discussion outlines the basis for each of the effluent limitations in Kenai's proposed NPDES permit. The limitations proposed are either technology-based, water quality-based, or a combination of technology and water quality-based information.

A. Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)

The Kenai wastewater treatment plant (WWTP) is a secondary treatment facility that employs biological treatment. As such, the facility is subject to the technology-based requirements for five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) of 40 CFR 133.102, as outlined in Table C-4.

Table C-4: Secondary Treatment Requirements			
Parameter	**Monthly Average (mg/L)**	**Weekly Average (mg/L)**	**Percent Removal (%)**
BOD_5	30	45	85
TSS	30	45	85

In addition to the concentration limits, 40 CFR 122.45(f) requires that NPDES permits contain mass-based limits for such pollutants as BOD5 and TSS. The draft permit establishes loading limits based on Kenai's current design capacity of 1.3 mgd (40 CFR 122.45(b)). The limits are calculated by multiplying the concentration limits by the design flow and a conversion factor of 8.34 pound•liter/milligram•million gallons, as shown below:

Monthly Average Load: = (1.3 mgd)(30 mg/L)(8.34)
= **325 lbs/day**

Weekly Average Load: = (1.3 mgd)(45 mg/L)(8.34)
= **488 lbs/day**

B. pH

In addition to limits on BOD5 and TSS, 40 CFR 133.102 specifies a pH range from 6.0 to 9.0 standard units for POTWs. The State water quality standards for protection of aquatic life (18 AAC 70.020) require that ambient pH be in the range of 6.5 - 8.5 standard units. The draft permit incorporates the water quality-based limits of 6.5 - 8.5 standard units that appeared in the current permit.

C. Fecal Coliform Bacteria

In establishing fecal coliform limits for Kenai's draft permit, EPA considered five different requirements: a) Alaska's water quality standard for harvesting for consumption of raw mollusks or other aquatic life; b) Alaska's water quality standard for primary recreation; c) Alaska's water quality standard for secondary recreation; d) the limits in the 1999 permit and e) Alaska's wastewater treatment regulations at 18 AAC 72 that define disinfection for secondary facilities.

1. The State water quality standards contain criteria for fecal coliform bacteria for waters protected for contact recreation (18 AAC 70.020(2)(b)(i)).

    Monthly geometric mean: 100/100 mL (based on a minimum of 5 monthly samples).

Not more than 1 sample or no more than 10 percent if more than 10 samples are collected may exceed 200/100 mL.

2. The State standards for secondary contact recreation (18 AAC 70.020(2)(B)(ii)):

   Monthly geometric mean of 200/100 mL (based on a minimum of 5 monthly samples) and

   no more than 10 percent may exceed 400/100 mL.

3. The State standards for harvesting for consumption of raw mollusks or other raw aquatic life (18 AAC 70.020(2)(D)):

   Median MPN may not exceed 14 FC/100 mL and

   not more than 10 percent of the samples may exceed a fecal coliform median MPN of 43 FC/100 mL.

4. Alaska wastewater disposal regulations at 18 AAC 72 define "disinfect" as a means to treat by means of a chemical, physical, or other process, such as chlorination and produces an effluent with the following characteristics:

   a. an arithmetic mean of the values for a minimum of five effluent samples collected in 30 consecutive days that does not exceed 200 FC/100 mL; and
   b. an arithmetic mean of the values for a minimum of five effluent samples collected in 7 consecutive days that does not exceed 400 FC/100 mL.

The draft permit incorporates the fecal coliform limits from the current permit. Because the State previously allowed a mixing zone to achieve a minimum initial dilution of 18:1, the water quality-based fecal coliform limits would be a median of 14 X 18 or 252 FC/100mL. The wastewater disposal regulations are more stringent, so they were used in the current permit to develop the proposed monthly average and weekly average limitations for fecal coliform. The daily maximum limitation was based on the requirement that not more than 10 percent of the samples may exceed a fecal coliform median MPN of 43 FC/100 mL. Based on the dilution of 18:1, the result was a value of 774 FC/100 mL. Table C-5 presents the draft permit limits for fecal coliform.

Table C-5: Fecal Coliform Limits

Time Period	**Monthly Average**[1]	**Weekly Average**[1]	**Daily Maximum**

Fecal Coliform Bacteria	200	400	774[2]
Notes: 1. Based on ADEC secondary technology regulations at 18 AAC 72. 2. Facility shall not exceed 774/100 mL in more than 10% of samples over a 30-day period. Based on a dilution of 18:1.			

D. Total Residual Chlorine

The State water quality standards for total residual chlorine for protection of aquatic life (18 AAC 70.020(2)(A)(i)) have changed since the previous permit. The acute criterion is 13 µg/L, and the chronic is 7.5 µg/L. The previous permit specified that total residual chlorine (TRC) must be below detectable amounts using amperometric or DPD analytical methods. The calculations resulted in draft permit limits of 59 and 23 µg/L as a daily maximum and monthly average, respectively. With the new chlorine criteria, there is no reasonable potential for the discharge to exceed the criteria at the edge of the mixing zone. However, federal backsliding provisions prevent placing less stringent limits in a reissued permit. The total residual chlorine limits from the current permit shall be placed in the draft permit.

E. Temperature

The State of Alaska water quality criteria for temperature for Cook Inlet states that the discharge may not cause the weekly average temperature to increase more than 1 °C. Calculations using the maximum measured effluent temperature (16 °C) and the maximum ambient data obtained during the current permit cycle (14 °C) show that the ambient temperature is not expected to rise more than 0.11 °C at the edge of the chronic mixing zone.

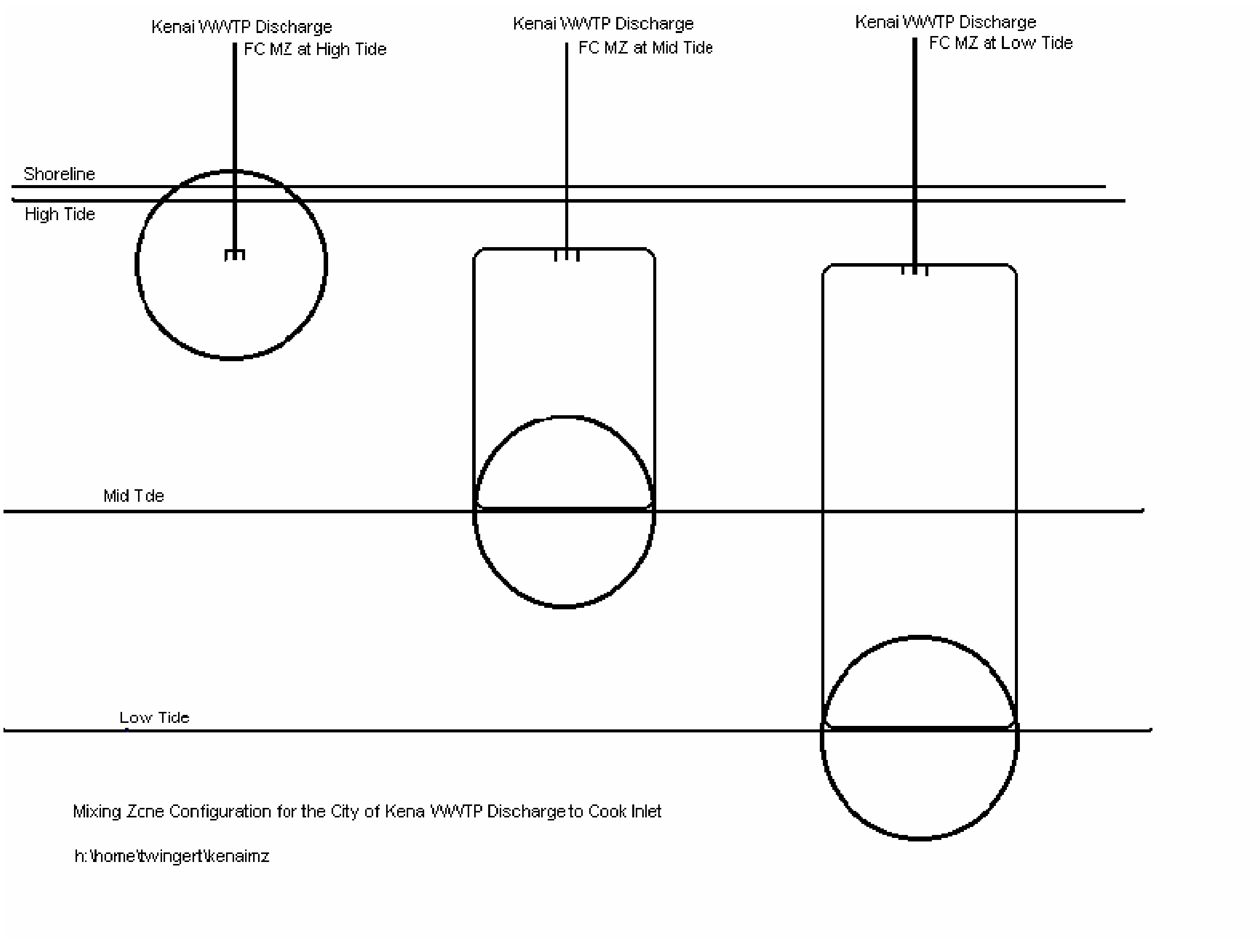
F. Total Ammonia (as N)

Low concentrations of ammonia can be toxic to fish, particularly salmonids. Un-ionized ammonia (NH_3) is the principal toxic form of ammonia. In May 1999, the State of Alaska adopted the 1989 EPA saltwater criteria for ammonia. The previous permit required monitoring to determine reasonable potential for the discharge to exceed criteria at the edge of the mixing zone. Based on calculations using receiving water monitoring and monthly effluent monitoring, there was no reasonable potential for ammonia from the discharge to exceed the criteria, therefore no limits are required in the permit.

G. Floating, Suspended or Submerged Matter

The state water quality standard (18 AAC 70.020) requires surface waters of the State to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses. This condition will be retained in the draft permit.

H. Diagram of Mixing Zone



SPREADSHEET 1

REASONABLE POTENTIAL CALCULATION

				State Water Quality Standard		Max concentration at edge of...			CALCULATIONS								
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
Arsenic	0.994	0.994	1.8750	69.0000	36.0000	5.40	5.40	NO	0.99	0.803	29.000	0.60	0.55	21	2.26	18	18
Cadmium	0.994	0.994	0.0560	40.0000	8.8000	0.20	0.20	NO	0.99	0.803	1.000	0.73	0.66	21	2.62	18	18
Copper	0.830	0.830	0.8900	4.8000	3.1000	3.02	3.02	NO	0.99	0.848	23.000	0.60	0.55	28	2.05	18	18
Silver	0.850		0.1070	1.9000		0.31		NO	0.99	0.803	1.430	0.87	0.75	21	3.02	18	
Zinc	0.946	0.946	2.3500	90.0000	81.0000	20.76	20.76	NO	0.99	0.803	123.000	0.82	0.72	21	2.87	18	18
Total Ammonia (as N)				5450.0000	820.0000	672.03	672.03	NO	0.99	0.599	3830.00	0.60	0.55	9	3.16	18	18
Lead	0.951	0.951	0.1300	210.0000	8.1000	0.38	0.38	NO	0.99	0.010	0.373	0.60	0.55	1	13.19	18	18
Nickel	0.990	0.990	1.3700	74.0000	8.2000	3.07	3.07	NO	0.99	0.010	2.450	0.60	0.55	1	13.19	18	18

SPREADSHEET 2

REASONABLE POTENTIAL CALCULATION FOR PROTECTION OF HUMAN HEALTH

Revised 3/00	Ambient Concentration (Geometric Mean)	Water Quality Criteria for Protection of Human Health	Max concentration at edge of chronic mixing zone.	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT	MAXIMUM DAILY EFFLUENT LIMIT	Estimated Percentile at 95% Confidence		Max effluent conc. measured	Coeff Variation		# of samples from which # in col. K was taken	Multiplier	Calculated 50th percentile Effluent Conc. (When n>10)	Dilution Factor
Parameter	ug/L	ug/L	ug/L			ug/L	ug/L		Pn	ug/L	CV	S	n			
Antimony	0.0000	4300.00	0.22	**NO**	**1**	**NONE**	**NONE**	0.50	0.05	1.57	0.60	0.6	1	2.49		18.0
Cyanide	0.00	220000.00	0.80	**NO**	**1**	**NONE**	**NONE**	0.50	0.05	5.80	0.60	0.6	1	2.49	0.00	18.0
Manganese	0.0000	100.00	3.87	**NO**	**1**	**NONE**	**NONE**	0.50	0.05	28.00	0.60	0.6	1	2.49	0.00	18.0
Nickel	0.0000	4600.00	0.34	**NO**	**1**	**NONE**	**NONE**	0.50	0.05	2.45	0.60	0.6	1	2.49	0.00	18.0
Zinc	0.0	69000.00	3.69	**NO**	**1**	**NONE**	**NONE**	0.50	0.87	123.00	0.60	0.6	21	0.54	0.00	18.0

APPENDIX D - SLUDGE/BIOSOLIDS

The sludge management regulations of 40 CFR 503 were designed so that the standards are directly enforceable against most users or disposers of sewage sludge, whether or not they obtain a permit. Therefore, the publication of Part 503 in the *Federal Register* on February 19, 1993 served as notice to the regulated community of its duty to comply with the requirements of the rule, except those requirements that indicate that the permitting authority shall specify what has to be done.

The requirements of 40 CFR 503 have to be met when sewage sludge is applied to the land, placed on a surface disposal site, placed on a municipal solid waste landfill (MSWLF) unit, or fired in a sewage sludge incinerator.

Requirements are included in Part 503 for pollutants in sewage sludge, the reduction of pathogens in sewage sludge, the reduction of the characteristics in sewage sludge that attract vectors, the quality of the exit gas from a sewage sludge incinerator stack, the quality of sewage sludge that is placed in a MSWLF unit, the sites where sewage sludge is either land applied or placed for final disposal, and for a sewage sludge incinerator. The sections of the federal standards at 40 CFR 503 applicable to this facility's draft practices are Section A (General Provisions, 503.1-9), Section B (Land Application, 503.10-18), and Section D (Pathogen & Vector Control, 503.30-33).

EPA will issue a sludge-only permit to this facility at a later date. This will likely be in the form of a general permit through which EPA can cover and better serve multiple facilities. Meanwhile, the environment will be protected since the permittee's sludge activities will continue to be subject to the national sewage sludge standards at 40 CFR 503. The CWA prohibits any use or disposal of biosolids not in compliance with these standards. EPA has the authority under the CWA to enforce these standards directly, including in the absence of a permit. The CWA does not require the facility to have a permit prior to use or disposal of biosolids. Also, the State of Alaska conducts a program to review and approve biosolids activities.

APPENDIX E - ENDANGERED SPECIES ACT

USFWS SPECIES

In a letter dated August 10, 2005 (consultation no. 2005253) the US Fish and Wildlife Service (USFWS) identified the following federally listed species in the area of discharge:

1. Endangered Species
   - None in the area of the discharge
2. Threatened Species
   - Steller's eiders (AK breeding pop) *(Polysticta stelleri)*
   - Sea otters *(Enhydra lutris kenyoni)*
3. Candidate Species
   - Kittlitz's murrelets *(Brachyramphus brevirostris)*

STELLER'S EIDER (*Polysticta stelleri*)

The Alaskan breeding populations of Steller's eider were listed as threatened under the ESA on June 11, 1997.

Range of Species

The historical breeding range of the Alaska-breeding population of Steller's eider is unclear; it may have consisted of meta-populations from the eastern Aleutian Islands to the western and northern Alaska coasts, possibly to the Canadian border (USFWS 2001). Pre-1970 data suggests that the birds formerly nested on the Yukon-Kuskokwim River Delta in western Alaska and at least occasionally at other western Alaska sites, including the Seward Peninsula, St. Lawrence Island, and possibly the eastern Aleutian Islands and Alaska Peninsula (USFWS 2002).

Recent breeding has occurred in two general areas outside of the general NPDES permit area, the Arctic Coastal Plain and on the Y-K Delta in western Alaska (USFWS 2001). The Arctic Coastal Plain area is extremely important to nesting Steller's eiders (USFWS 2002). An aerial survey, conducted from 1999-2002, from Barrow to Meade River (approximately 1,064 square miles) reported between 2 to over 100 breeding pairs. Only seven nests were found on the Y-K Delta from 1994-2002 (USFWS 2002).

Since birds from both the Alaskan and Russian breeding populations intermix on the wintering grounds, it is unknown what percentage of the birds that winter in areas covered by the NPDES permit area are protected under the ESA (Alaskan breeding populations only).

Critical Habitat

The U.S. Fish and Wildlife Service designated approximately 2,830 square miles as critical habitat for the Steller's eider in Alaska in five units, which are:

Unit 1. Yukon-Kuskokwim Delta. This unit includes the vegetated intertidal zone of the central delta from the Askinuk Mountains to northern Nelson Island. It encompasses 989 square miles.

Unit 2. Kuskokwim Shoals. This unit includes a portion of northern Kuskokwim Bay from the mouth of the Kolavinarak River to near the village of Kwigillingok, extending approximately 11-24 miles offshore. It encompasses approximately 1,472 square miles of marine waters and about 115 miles of shoreline.

Unit 3. Seal Islands. This unit includes all waters enclosed within the Seal Islands lagoon and marine waters 1/4 mile offshore of the islands and adjacent mainland. It encompasses 24 square miles and 65 miles of shoreline. This unit was originally proposed as a subunit of the North Side of the Alaska Peninsula unit but is now identified separately.

Unit 4. Nelson Lagoon. This unit includes all of Nelson Lagoon and portions of Port Moller and Herendeen Bay and marine waters 1/4 mile offshore of the islands and adjacent mainland.. This unit encompasses 205 square miles and 149 miles of shoreline. This complex was originally proposed as a subunit of the North Side of the Alaska Peninsula unit but is now identified separately.

Unit 5. Izembek Lagoon. This unit includes all waters of Izembek Lagoon, Moffett Lagoon, Applegate Cove, and Norma Bay and marine waters 1/4 mile offshore of the islands and adjacent mainland. It encompasses 140 square miles of marine waters and 186 miles of shoreline. This unit was originally proposed as a subunit of the North Side of the Alaska Peninsula unit but is now identified separately.

Life History

Steller's eider nest on coastal tundra adjacent to small ponds or drained but can range as far inland as 56 miles (USFWS 2002). Young hatch in late June and feed in wetland habitat on aquatic insects and plants until they fledge, in about 40 days. After breeding, Steller's eiders move to marine waters, where they molt and individuals remain flightless for about three weeks, primarily area along the north side of the Alaska Peninsula, in Izembek Lagoon, Nelson Lagoon, Port Heiden, and Seal Islands (outside of the general NPDES permit) (USFWS 2002). Dispersal follows shortly after molting to the Aleutian Islands, the south side of the Alaska Peninsula, Kodiak Island, and as far east as Cook Inlet. During this phase, Steller's eiders feed primarily on marine invertebrates.

Population Trends and Risks

Population estimates conducted in 1992 indicated that at least 138,000 birds wintered in southwest Alaska; although it is uncertain how many belong to the Alaska-breeding population (USFWS 2002). With the species disappearing from much of its historical range in western Alaska, it appears that the breeding range in Alaska has been substantially reduced (USFWS 2000b).

The Alaska-breeding population of the Steller's eider is considered to be at risk due to the following factors:

- Exposure to lead thought to result primarily from the ingestion of spent lead shot when foraging.

- Although no information suggests that disease contributed to the decline, recent sampling suggests that Steller's eiders may have high exposure rates to an Adenoviridae (USFWS 2002).
- An increase in predation in breeding areas.
- Shooting of Steller's eider is known to occur although hunting of Steller's eider is prohibited under the Migratory Bird Treaty Act.

The Steller's Eider Recovery Plan (USFWS 2002) suggests that more information is needed to assess the natural or anthropogenic factors that may be adversely affecting this species.

Determination of Not Likely to Adversely Affect

According to the USFSW August 10 2005 letter, no critical habitat is designated in the vicinity of the discharge. Since the critical habitat for the species is outside of the area of the discharge, and the species are mobile animals that can leave the area of the discharge, the effects will be insignificant. Therefore, EPA has determined that the discharge is not likely to adversely affect the Steller's eider.

NORTHERN SEA OTTER (*Enhydra lutris kenyoni*)

The USFWS listed the southwest Alaska distinct population segment of the northern sea otter as threatened under the ESA on August 9, 2005 (USFWS 2005a).

Range of Species

The overall range of the sea otter (*Enhydra lutris*) extends from northern Japan to southern California. There are three recognized subspecies: the northern sea otter (*E. lutris kenyoni*), the southern sea otter (*E. lutris nereis*), and Russian sea otter (*E. lutris lutris*). The northern sea otter is the subspecies of concern for this permit. It has a range that extends from the Aleutian Islands to the coast of the state of Washington (USFWS 2005a).

Sea otters generally occur near the shoreline where they forage in shallow water areas. Sea otter movements are influenced by several environmental factors including storm events, prevailing winds, and tidal conditions. Sea otters have small home ranges and usually do not migrate or travel long distance unless an area has become overpopulated and food is scarce (ADFG 1994d).

Critical Habitat

No critical habitat has been designated for the northern sea otter.

Life History

Sea otters mate year-round, and young are born in any season. In Alaska, most pups are born in late spring (ADFG 1994d). Male sea otters reach maturity at 5-6 years, and have a lifespan of about 10-15 years. Female sea otters reach maturity at 3-4 years, and have a lifespan of about 15-20 years (USFWS 2005a). Sea otters will concentrate in an area, sometimes forming groups over 1,000 individuals (ADFG 1994d).

Foraging is the primary activity of sea otters. Prey items include sea urchins, crabs, clams, mussels, octopus, other marine invertebrates, and fishes (ADFG 1994d).

Population Trends and Risks

Prior to commercial fur hunting, the North Pacific sea otter population estimates were 150,000 - 300,000 individuals (USFWS 2005a). Sea otters were hunted to near extinction until protection under the International Fur Seal Treaty of 1911 (USFWS 2005a).
Since protection, sea otters in southwest Alaska had increased in abundance and re-colonized much of their former range. Population estimates in southwest Alaska is 41,865 individual (USFWS 2005a).

Determination of Not Likely to Adversely Affect

The USFWS issued a final rule listing the southwest Alaska distinct population segment of the northern sea otter as threatened under the ESA on August 9, 2005 (USFWS 2005). According to the USFWS August 10 letter, while sea otters frequent Lower Cook Inlet, only those individuals occupying the western shores of Cook Inlet are considered the southwest Alaska population. Therefore, the USFWS does not anticipate effects to this species near Kenai, which is on the eastern shore.

KITTLITZ'S MURRELET *(Brachyramphus brevirostris)*

The Kittlitz's Murrelet was proposed as a candidate for listing as an endangered or threatened species on May 11, 2005 (USFWS 2005a). The Kittlitz's Murrelet is a small diving seabird whose entire North American population and most of the world's population inhabits Alaskan coastal waters. The following information was summarized from USFWS 2005b.

Geographic Boundaries and Spatial Distribution

All of North American and a large proportion of the known world population of Kittlitz's murrelets breed, molt, and winter in Alaska (Day et al. 1999). An estimated 10 percent of the world population breeds in the Russian Far East from the Okhotk Sea to the Chukchi Sea (Day et al. 1999), but recent observations of large numbers of Kittlitz's murrelets have been reported from the Kamchatka Peninsula (Vyatkin 1999). Kittlitz's murrelets in Alaska primarily occur in four regions: 48 percent occur in Southeast Alaska, 22 percent occur in Southcentral Alaska, 16 percent occur in the Aleutian Islands and 14 percent occur on the Alaska Peninsula.

Critical Habitat

Critical habitat has not been designated for this species.

Historical Information

Kittlitz's murrelets inhabited coastal waters discontinuously from Point Lay south to northern portions of Southeast Alaska. Prior to the 1970's, Kittlitz's murrelet in the North Gulf Coast were estimated to number in the hundreds of thousands (Isleib and Kessel 1973). Large numbers of Kittlitz's murrelets were observed along the Lisburne Peninsula, at Kodiak Island and at Cold Bay on the Alaska Peninsula during the early 1970's (Day et al. 1999). This suggests that a significant number of birds occurred in the Chukchi Sea at that time. The Lisburne Peninsula and Cold Bay on the Alaska Peninsula have not been surveyed since then. Recent surveys around Kodiak Island indicate that Kittlitz's murrelets no longer use waters around that island to any great extent.

The winter range of the Kittlitz's murrelet is not well known, but is probably pelagic (Day et. al. 1999). There are records of occasional winter sightings in Southeast and western Alaska, and locally common sightings in a few locations in Southcoastal Alaska (Day et al. 1999, Kendall and Agler 1998). Kittlitz's murrelets are also reported during winter in the mid-shelf regions of the northern Gulf of Alaska (Day and Prichard 2001). Winter range of the species outside the Americas is largely unknown, but observations have been reported from Kamchatka Peninsula and the Kuril Islands in the Russian Far East (Flint et al. 1984).

Life History

Kittlitz's murrelet (Brachyramphus brevirostris) is a small diving seabird similar in appearance to the marbled murrelet. Kittlitz's murrelets have greater body mass, larger heads and smaller bills than marbled murrelets (Pitocchelli et al. 1995).

The Kittlitz's murrelet is a secretive breeder with only about two dozen nest sites recorded (Day et al. 1999) and specific breeding habitat requirements are not very well known. The Kittlitz's murrelet nests in unvegetated scree-fields, coastal cliffs, barren ground, rock ledges and talus above timberline in coastal mountains, generally in the vicinity of glaciers, primarily from the Alaska Peninsula to Glacier Bay (Day 1995, Day et al. 1983, Day et al. 1999, Piatt et al. 1999).

During the breeding season, the species' distribution is highly clumped within its geographic range (Isleib and Kessel 1973). Birds tend to congregate in preferred habitat near tidewater glaciers, and to a lesser extent, offshore of remnant high-elevation glaciers and deglaciated coastal mountains (Day et al. 1999, Day and Nigro 1999). Kittlitz's murrelets can also be found along coasts where waters are influenced by glacial outwash, such as the Malaspina Forelands, where glacial runoff seeps across miles of exposed coast before entering the ocean (Kozie 1993). In general, the species associates more with glacially-influenced waters than the marbled murrelet (Day et al. 1999). During the breeding season, Kittlitz's murrelets appear to favor waters >200 m from shore (Day et al. 2000). During the non-breeding season, the marine distribution of Kittlitz's murrelets is farther offshore. In the northern Gulf of Alaska during winter and spring, Kittlitz's murrelets prefer the Alaska Coastal Current and mid-shelf regions, and avoid the shelf-break front and Alaska Stream (Day and Prichard 2001). In winter, Kittlitz's murrelets occaisionally occur in the protected waters of Prince William Sound, Kenai Fjords, Kachemak Bay and Sitka Sound (Day et al. 1999, Kendall and Agler 1998).

Population Trends and Risks

The current Alaska population estimate of the Kittlitz's murrelet is 16,694 (8,114-28,179). Previously, the Kittlitz's murrelet population was estimated at 12,130(Kendal and Angler 1998) and 17,037 (USFWS 2004). Kittlitz's murrelets in Alaska are declining at a rate of up to 18 percent per year (Kuletz et al. 2003, USFWS 2004) The greatest downward trends have been reported from Prince William Sound, in Southcentral Alaska, where the Kittlitz's murrelet population has declined 84 percent over 11 years (USFWS 2004)

The Kittlitz's murrelet population along the coast of the Kenai Fjords declined by a statistically significant 74 percent between 1986 and 2002 (Van Pelt and Piatt 2003). Kittlitz's murrelets in Lower Cook Inlet, Southcentral Alaska, have declined 13 percent per year since 1984 (Speckman et al. 2005). In Glacier Bay, Southeast Alaska, the species has undergone a statistically significant decline (Robards et al. 2003) and it is predicted that this population will decline to less than 1 percent of its year 200 density by 2026 and to less than 0.1 percent of its year 2000 density by 2039 (Nations and Manly 2002). Kittlitz's murrelets from the Malaspina Forelands, Southeast Alaska, declined as much as 75 percent over 19 years (Kissling et al. 2005)

Current threats to this population include: 1) destruction, modification or curtailment of its habitat or range. Kittlitz's murrelets are vulnerable to oil pollution due to their diving behavior, tendency to cluster in nearshore waters and low productivity. The Exxon Valdez spill resulted in the direct mortality of 500-1000 Kittlitz's murrelets (Piatt et al. 1990, van Vleit and McAllister 1994), resulting in a loss of 7-15 percent of the Prince William Sound population; 2) overutilization for commercial and recreational purposes. Recreational and commercial tourism has increased substantially in many of the Kittlitz's murrelets breeding areas, including Glacier Bay, PWS, Kenai Fjords and lower Cook Inlet/Kachemak Bay (Murphy et al. 2004). Gillnet fisheries are also a conservation concern for Kittlitz's murrelet, as murrelets comprise 11-70 percent of seabird mortality from gillnets (Carter et al. 1995); 3) inadequacy of existing regulatory mechanisms and 4) natural or manmade factors affecting its continued existence. Ninety-nine percent of Kittlitz's murrelets documented during a survey of Prince William Sound were observed in five glacial fjords in the northwestern portion of the sound (Kuletz et al. 2003).

Kittlitz's murrelet preference for areas near tidewater glaciers may be related to higher primary productivity in these areas. Glacial retreat could result in changes in food availability, reduced nesting habitat and increased predation.

Determination of Not Likely to Adversely Affect

Kittlitz's murrelets were listed as a candidate species under the ESA in May 2004. According to the USFWS August 10 letter, in winter, few Kittlitz's murrelets occur in the protected waters of Kachemak Bay, and research is currently underway to understand the importance of Lower Cook Inlet/Kachemak Bay during the breeding season. The Kenai WWTP discharge is over 50 miles north of Kachemak Bay. The species are mobile animals and can leave the area of the discharge, so the effects will be insignificant. EPA has determined that the discharge is not likely to adversely affect the Kittlitz's murrelets.

NOAA NMFS SPECIES

In a letter dated August 31, 2005 the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) identified the following federally listed species in the Cook Inlet subarea:

1. Endangered Species
    - Steller (Northern) Sea Lions *(Eumetopias jubatus)*
    - Fin Whale *(Balaenoptera physalus)*
    - Humpback Whale *(Megaptera novaeangliae)*

2. Threatened Species

- None in the area

3. Candidate Species
   - None in the area

4. Species of Concern
   - Cook Inlet Beluga Whale *(Delphinapterus leucas)*

The Cook Inlet beluga whale has since become a candidate for listing as an endangered species.

Additionally, according to the NMFS letter, several ESA-listed stocks of Pacific salmon may occur within these waters. These include the following Evolutionary Significant Units (ESUs): Snake River fall chinook, Snake River spring/summer chinook, Puget Sound chinook, Upper Columbia River spring chinook, Lower Columbia River spring chinook, Upper Columbia River steelhead, Upper Willamette River steelhead, Middle Columbia River steelhead, Lower Columbia River steelhead, and Snake River basin steelhead. However, the letter states that there is no information of listed salmonids within Cook Inlet, but tag recoveries from the Gulf of Alaska indicate that theses species/Evolutionary Significant Units (ESUs) might occur there.

Of the listed species, NMFS expects only the Steller sea lion to occur in the immediate area of the treatment facility or receiving waters near the mouth of the Kenai River. NMFS also noted that the Cook Inlet beluga whale, which is listed as depleted under the Marine Mammal Protection Act and has been proposed for listing as an endangered species by NMFS, occurs in these waters. They recommended that EPA consider the effects of the discharge on the belugas.

STELLER SEA LIONS (*Eumetopias jubatus*)

On April 5, 1990, the NMFS listed Steller sea lion as threatened, by emergency interim rule, (NMFS 1990a). Final listing of Steller sea lion as threatened on November 26, 1990 (NMFS 1990b). On May 5, 1997, the NMFS issued a final rule which reclassified Steller sea lions into two distinct population segments: the Steller sea lion population west of 144ºW longitude was reclassified as endangered and the population to the east of this line remained as threatened (NMFS 1997).

<u>Range of Species</u>
The Steller sea lion is ranges from northern Hokka, Japan, north through the Kuril Islands and Okhotsk Sea, east through the Aleutian Islands and central Bering Sea, and south to the Channel Islands, California (NMML 2004b). Two distinct populations (western and eastern) are thought to occur within this range, with the dividing line being designated as 144ºW longitude (NMFS 1997).

<u>Critical Habitat</u>
In 1993, NMFS issued a final rule designating critical habitat for the Steller sea lion, including all U.S. rookeries, major haulouts in Alaska, horizontal and vertical buffer zones around these rookeries and haulouts, and three aquatic foraging areas in north Pacific waters: Sequam Pass, southeastern Bering Sea shelf, and Shelikof Strait (NMFS 1993). This final rule was amended on

June 15, 1994 to change the name of one designated haulout site from Ledge Point to Gran Point and to correct the longitude and latitude of 12 haulout sites, including Gran Point (NMFS 1994).

Critical habitat includes a terrestrial zone that extends 3,000 ft (0.9 km) landward from the baseline or base point of each major rookery and major haulout in Alaska. Critical habitat includes an air zone that extends 3,000 ft (0.9 km) above the terrestrial zone of each major rookery and haulout area measured vertically from sea level. Critical habitat within the aquatic zone in the area east of 144ºW longitude (ESA threatened population) extends 3,000 ft (0.9 km) seaward in state and federally managed waters from the base point of each rookery or major haulout area. Critical habitat within the aquatic zone in the area west of 144ºW longitude (ESA endangered population) extends 20 nautical miles (37 km) seaward in state and federally managed waters from the baseline or base point of each rookery or major haulout area (NMFS 1993).

There is designated critical habitat for Steller sea lion and other habitat considered as critical habitat by the NMFS at Cape Douglas, the Barren Islands, and marine areas adjacent to the southwestern Kenai Peninsula, and at the extreme southern end of Cook Inlet.

Life History

Animals congregate at rookeries in May to June to breed. Non-reproductive individuals congregate haulout sites. Males mature between 3 and 8 years, but often cannot successfully defend territories until 9 years. Females mature and mate at 4 -6 years and typically bear a single pup each year. Sea lions continue to gather at both rookeries and haulout sites throughout the year, outside of the breeding season (NMML 2004b). Rookeries and haulouts include rock shelves, ledges, and slopes and boulder, cobble, gravel, and sand beaches.

Steller sea lions typically forage in surface to mid-water ranges along coastal regions. They are considered opportunistic predators and feed on a variety of fish and invertebrates (ADFG 1994c; NMML 2004b).

Population Trends and Risks

In 1980, world population estimates of Steller sea lions were 245,000 - 290,000 individuals (Loughlin et al. 1992). The western population of Steller sea lion declined about 5.0 percent per year between 1991 and 2000, while the eastern population has increased about 1.7 percent per year (Loughlin and York 2000). Data collected 2003 - 2004, suggests an increase estimated at 2.4 to 4.2 percent per year in western population within Alaskan territory (Fritz and Stinchcomb 2005).

The cause of the rapid decline of the species has determined. Factors putting the Steller sea lion at risk include:

- A reduction in prey availability or prey quality due to commercial fishing and climate changes.
- Disease that inhibit sea lions' efficient foraging.
- Consumption of contaminated prey resulting in non-reproduction.
- Predation by killer whales.

- Incidental mortality caused by commercial fishing.
- Illegal and subsistence harvesting.
- Mortality from contagious pathogens or increased pollutant exposure.

Determination of Not Likely to Adversely Affect

Critical habitat for the Steller sea lion has been designated. The Kenai discharge is over 50 miles north of the edge of the nearest aquatic zone surrounding a rookery or haulout. (see attached critical habitat map). Effluent from the facility is thus diluted to negligible levels by the time it reaches the haulout or rookery sites. Because the animals are mobile, they can swim out of the area of the discharge and get food from other areas. Therefore, the effects will be insignificant, and EPA has made a determination that the discharge is not likely to adversely affect the Steller sea lion.

FIN WHALE (*Balaenoptera physalus*)

The fin whale was listed as endangered under the ESA on June 2, 1970.

Range of Species

Fin whales along the Pacific coast have been reported during the summer months from the Bering Sea to central Baja California. Three stocks of fin whales are recognized: Alaska (Northeast Pacific), California/Washington/Oregon, and Hawaii (Angliss and Lodge 2003; NMFS 2003a).

Fin whales are seldom observed in inshore coastal waters and prefer to forage primarily in offshore waters, encompassing an area that includes the continental shelf break (Gregr and Trites 2001). Although sighting data suggests seasonal variability, fin whales regularly inhabit and forage in areas near NPDES permit coverage including Shelikof Strait, Uganik and Uyak bays along Kodiak Island, and the Gulf of Alaska (MMS 2003).

Critical Habitat

No critical habitat has been designated for the blue whale.

Life History

Fin whales tend gather in pods of 2 or more whales. The life span of fin whales can be as great as 90 years, with sexual maturity occurring at of 6 - 10 years in males and 7-12 years in females (OBIS 2005). Fin whales forage on a variety of fish and zooplankton species (OBIS 2005).

Population Trends and Risks

The pre-whaling population estimates of North Pacific fin whales range from 42,000 to 45,000 individuals. Early 1970's estimates range from 14,620 to 18,630 whales (Ohsumi and Wada 1974). There have been few sightings of fin whales in Alaskan waters.
The Northeast Pacific fin whale is considered to be at risk due to the following factors:

- Commercial harvest of fin whales between 1946 and 1975 is estimated at 46,032 (NMFS 2003a). From the mid-1950s to mid 1960s, commercial whaling took 1,000 to 1,500 individual per year from the North Pacific.

- A single ship strike fin whale mortality has been reported in Uyak Bay, Alaska in 2000 (NMFS 2003a). Additional ship strike mortalities may go unreported.
- The commercial fishing industry remains a potential threat even though only a single mortality has even been reported. In 1999, one fin whale incidental mortality was reported from the Bering Sea/Aleutian Island groundfish trawl fishery (NMFS 2003a).

Determination of No Effect

Issuing the NPDES permit for the Kenai WWTP will have no effect on fin whales because they do not occur in nearshore marine waters where the effluent is discharged (the effluent would be well-mixed to ambient conditions before reaching this species).

HUMPBACK WHALE (*Megaptera novaeangliae*)

The humpback whale was listed as endangered under the ESA on June 2, 1970.

Range of Species

The humpback whale is known to occur in each of the world's oceans; however it is not common in Arctic waters. Four stocks of humpback whales, Gulf of Maine, eastern North Pacific, central North Pacific, and western North Pacific, are recognized in the U.S based on unique winter ranges (NMFS 2005a). In Alaskan waters, the central North Pacific stock tend to concentrate in southeast Alaska, Prince William Sound, near Kodiak and Barren Islands, between the Semidi and Shumagin Islands, eastern Aleutian Islands, and the southern Bering Sea (ADFG 1994b).

Research in waters off southeastern Alaska indicates humpback whales use discrete, geographically isolated feeding areas which individual whales return to each year. Movement of whales between these areas is relatively uncommon (Perry et al. 1999).

Although humpback whales are observed year-round in Alaska, most individuals migrate in the fall to temperate or tropical areas. During summer months, humpback whales regularly are present and feeding in areas near the coast of Alaska. Humpback whale may also be present in these areas through autumn.

Humpback whales feed preferentially over continental shelf waters (Gregr and Trites 2001) and are often observed relatively close to shore, including major coastal embayments and channels (NMFS 2005a).

Critical Habitat

No critical habitat has been designated for the humpback.

Life History

Humpback whales migrate seasonally mating and giving birth while in wintering areas outside of Alaskan waters. The life expectancy of humpback whales is 40 years, with sexual maturity occurring at 4 - 6 years (ADFG 1994b).

Humpback whales exhibit a variety of feeding behaviors to catch food including "bubble netting", cooperative feeding, and herding of prey (ADFG 1994b). Classified as prey generalists, humpback whales are known to prey upon a variety of species including krill, fish, and cephalopods. In Alaskan waters, humpback whales primarily forage on capelin, juvenile walleye pollock, sand lance, Pacific herring, and krill (NMFS 2003b; Perry et al. 1999).

Population Trends and Risks

The commercial whaling is believed to have reduced North Pacific humpback whales from approximately 15,000 animals to present day estimates of 4,000 individuals (ADFG 1994b; NMFS 2005a). Some portions of the Central North Pacific stock population increased between the early 1800's and 2000 but now have appeared to slow as it is believed the population is reaching carrying capacity (NMFS 2005a).

The Central North Pacific humpback whale is considered to be at risk due to the following factors:

- Commercial whaling harvested more than 28,000 animals from the North Pacific during the 20th century and by 1965 may have reduced this population to as few as 1,000 individuals (NMFS 2005a).
- Although information is scarce for Alaskan waters, direct ship strikes are a significant source of mortality in the eastern North Pacific stock (approximately 0.6 whales per year) (Perry et al. 1999). Additional ship strike mortalities may go unreported.
- Prior to 1990, there were thought to be little mortality in U.S. waters due to commercial fishing operations; however, data collected through 1995 from Hawaii and southeastern Alaska areas estimate minimum incidental mortality due to commercial fishing operations at 0.8 whales per year (Perry et al. 1999).
- Humpback whales are susceptible to noise pollution and have been known to have suffered severe damage to their ears from underwater blasting. Research has indicated that humpback will avoid areas of noise levels up to 116 db. Possible sources of increase noise include drillships, semisubmersibles, drilling platforms, and production platforms (Malme et al. 1985).

Determination of No Effect

Issuing the NPDES permit for the Kenai WWTP will have no effect on humpback whales because they do not occur in nearshore marine waters where the effluent is discharged (the effluent would be well-mixed to ambient conditions before reaching this species).

BELUGA WHALE *(Delphinapterus leucas)*

Beluga whales are one of the two members of the family Monodontidae and are divided into five stocks on the basis of mitochondrial DNA analyses: Cook Inlet, Bristol Bay, eastern Bering Sea, eastern Chukchi Sea, and Beaufort Sea (NMFS 2003). The Cook Inlet stock of beluga whales was placed on the ESA candidate list in 1991 (NMFS 1991). The stock was determined to be depleted under the Marine Mammal Protection Act (NMFS 2000c), but it was not considered endangered at that time because subsistence harvest was being restricted. The species did not recover with restricted subsistence harvest as expected. In 2006, a third petition to list the species was received. In response to the petition, NMFS determined that the action may be warranted and initiated a second Status Review. Based upon the Status Review, in April 2007 NMFS issued a proposal to list the Cook Inlet beluga as an endangered species.

Geographic Boundaries and Distribution

Beluga whales occur in arctic waters of the northern hemisphere, living in openings within the pack ice in winter and migrating to shallow bays and estuaries in summer. Beluga whales in U.S. waters range from Yakutat to the Beaufort Sea. Some beluga stocks migrate over thousands of miles for example, moving from the Bering Sea to the Mackenzie River estuary in Canada (ADFG 1994e). The winter distribution of the Cook Inlet stock is unknown, but few beluga whales have been observed in the Gulf of Alaska outside the inlet and sightings. Tagging data indicate that at least a portion of the Cook Inlet stock remains in the inlet throughout the year (NMFS 2002c; NMFS 2005d). In spring, Cook Inlet beluga whales move toward the upper portions of the inlet (NMFS 2005). Large groups may remain in and near the Susitna River, Little Susitna River, and the Turnagain Arm. Beluga whales are known to move up rivers including those feeding Cook Inlet; individuals from northern stocks have been observed in the Yukon River as far upstream as Tanana, Rampart, and Fort Yukon (ADFG 1994e).

Critical Habitat

NMFS is developing a proposed rule for critical habitat.

Life History

Beluga whales are small with adult males generally ranging in size from 11 to15 feet and females reaching 12 feet. Calves are born dark gray to brownish-gray with the color lightening to a yellow-white in adulthood. Reports of sexual maturity at range from 4 to 15 years with males taking longer than females (NMFS 2002c). Calves are born in late spring and early summer, usually in the summer concentration areas following a 14-month gestation period (ADFG 1994e). Adult females typically produce offspring once every 3 years. Members of the Cook Inlet stock have been observed calving in the Kachemak Bay, off the mouths of the Beluga and Susitna Rivers, and in the Turnagain arm (NMFS 2002c).

Belugas are social and are frequently observed in groups ranging in size from two to five to pods of more than 100 individuals. They are known to vocalize using grunts, clicks, chirps, and whistles to navigate, find prey and communicate. During summer months, they are often found in shallow waters and feed on schooling and anadromous fish including herring, capelin, eulachon, salmon and sculpins (ADFG 1994e). They are also known to eat octopus, squid, crabs, shrimp clams, mussels and sandworms; belugas appear to have greater feeding success in areas with dense concentrations of prey (NMFS 2002c).

Population Trends and Risks

NMFS stock assessment reports estimate the combined population of the five beluga whale stocks in U.S. waters at nearly 60,000 individuals (NMFS 2005d). NMFS reports that the population trends for the Beaufort Sea and Eastern Bering Sea stocks are unknown; these two stocks account for over 90 percent of the estimated population of beluga whales in U.S. waters (NMFS 2005d).

The population of the Eastern Chukchi stock consisting of 3,710 individuals shows no evidence of decline and NMFS considers the population of the Bristol Bay stock (1,619) to be stable to increasing (NMFS 2005d).

On the basis of the range of numbers reported, NMFS estimates that the population in the mid-1980s was between 1,000 to 1,300 individuals. Population trend analyses conducted on the Cook Inlet stock between June 1994 and June 1998 were constrained by the limited data available but showed a high probability that a 40 percent decline in the population had occurred during the time period (NMFS 2000d; NMFS 2005d).

NMFS included the Cook Inlet stock beluga whale stock on the candidate list of threatened and endangered species in 1991 (NMFS 1991). No further action was taken immediately following, although NMFS received two petitions in 1999 to list the Cook Inlet stock under the ESA (NMFS 2000c) resulting in the Cook Inlet stock being designated as depleted under the MMPA (NMFS 2000d). Subsequent investigations assessed natural and human-induced sources of potential impacts that included:

- Habitat capacity and environmental change
- Strandings events
- Predation
- Subsistence harvest
- Commercial fishing
- Oil and gas development

The investigations concluded that subsistence harvests presented the most immediate threat to the stock. Although NMFS found that other potential sources of impact could have some negative effect on recovery, none were considered significant (NMFS 2000c).

Population surveys since the imposition of mandatory and voluntary restrictions on subsistence harvests in 1999 show no clear trend and no indication that the population is increasing (NMFS 2005e). As a result, NMFS developed the *Draft Conservation Plan for the Cook Inlet Beluga Whale (Delphinapterus leucas)* in 2005 to establish goals and objectives that can be achieved cooperatively to promote the recovery of the Cook Inlet beluga whale population. The goals and objectives apply to a range of potential sources of impacts including those identified above as well as shoreline development, vessel traffic, and noise.

After a subsequent petition and Status Review, in 2007 NMFS proposed the Cook Inlet beluga for listing as an endangered species.

<u>Determination of Not Likely to Adversely Effect</u>

Habitat for the beluga whale includes a large body of water. The effects will be insignificant because the animals are mobile and can leave the area to swim in other parts of the water body. Food sources are found in other parts of the water body, also. In the 2003 Alaska Marine Mammal Stock Assessments, NMFS stated that no indication currently existed that municipal discharges had a quantifiable adverse impact on the beluga whale population, and the best available information indicated that this activity, alone or cumulatively, had not caused the stock to be in danger of extinction. Therefore, EPA has made a determination that the discharge is not likely to adversely affect the beluga whales.

SUMMARY
Of the species addressed in this document, three do not occur in areas where effluent may be discharged, and would therefore have no chance of encountering effluent. These species are the fin whale, humpback whale, and the northern sea otter. Permit issuance will have no effect on any of these species.

Since there is no information on listed stocks of Pacific salmon in Cook Inlet, EPA has determined that there will be no effect on any of these species.

The remaining species may occur in waters where discharge effluent may occur at detectable levels. For reasons discussed in the text above, EPA has determined that the discharge is not likely to adversely affect the Steller's eiders, Kittlitz's murrelets, Steller sea lions, or Cook Inlet beluga whale.

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