

AK-005333-3
Response to Comments

Aurora Energy LLC
NPDES Permit

U.S. EPA, Region 10
August 2003

Prepared by:
Cindi Godsey, EPA

In conjunction with:
Luke Boles, ADEC

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Introduction

EPA and ADEC received written comments on the issuance of the National Pollutant Discharge Elimination System (NPDES) permit for the Aurora Energy LCC's Chena River Power Plant from:

Allison-Deim, Jennifer	Gavora, Dan
Aurora Energy, LCC	Gibson, Charles
Barrett, Paul	Justice, Stan
Barrett, Robin	Kawasaki, Scott
Beaver Sports (Greg Whisehant)	Lavery, Karen
Beck, Tim	Maxwell, Robert
Benson, Carl	Miller, Joy
Callahan, Donald	Northern Alaska Environmental Center
Calvillo, Michelle	Peirce, Merrick
Chamber of Commerce (Buzz Otis)	Rosenberg, Ron
City of Fairbanks	Schlentner, Tonya
Downtown Association	Shuttleworth, Bev
Fairbanks Hotel (Doris Lundin)	Stannard, David
Fox, Robert and Karen	Thomas, Tim
Frank, Jr, Oscar	Usibelli Coal Mine, Inc.
Fritz, Stacey	Webb, Nancy

A Public Hearing was also held in Fairbanks on June 24, 2002. EPA received oral comments from:

Barrett, Paul	Kruse Roselius, Tamara
Beck, Tim	Mattielli, Warren
Bennett, Bruce	Peirce, Merrick
Boyles, Rhonda	Pendergrast, Don
Bunch, Rufus	Phillips, Bruce
Burns, Roger	Rainey, Susan
Champlin, June	Ritchie, Thomas
Davidson, Gail	Salmon, Cindy
Douglas, Guy	Salmon, George
Drozda, Robert	Schlenter, Tonya
Fischer, Gloria	Shewfelt, David
Fox, Robert	Stannard, David
Fristoe, Brad	Thomas, Tim
Fritz, Stacey	Thompson, Steve
Harbeck, Don	Tinsley, Ryan
Hegarty Lammers, Kelley	Wallace, Randall
Helfferich, Merritt	Warwick, Andy
Hussey, Arthur	Wood, Ginny
Justice, Stan	Yates, Douglas
Kovalik, Ron	

A copy of the transcript is part of the administrative record for the permit.

On July 2, 2001, EPA sent letters to the National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USF&WS) requesting a species list under the Endangered Species Act (ESA).

In a letter dated July 13, 2001, USF&WS state that no listed species occur in the project area and there is no designated or proposed critical habitat in the vicinity of the project and therefore concludes that the project is not likely to affect listed species or adversely modify designated critical habitat.

In a letter dated September 13, 2001, NMFS stated that there is no expectation for species of concern under ESA to occur in the project area.

In a letter dated July 2, 2002, NMFS concurred with the EPA's assessment in the Fact Sheet that impact to Essential Fish Habitat would be minimal and there were no objections to the project.

On August 5, 2002, EPA requested updated information from both NMFS and USF&WS regarding endangered species under ESA.

On August 6, 2002, NMFS stated in an e-mail from Lawrence R. Peltz that there are no ESA resources within the project area so no further ESA consultation is needed.

In a letter dated August 19, 2002, USF&WS stated that no new species had been added to the endangered species list so no further consultation under Section 7 of the Endangered Species Act (ESA) was necessary.

On April 16, 2003, EPA e-mailed the NMFS and USF&WS asking if there were any changes in their ESA lists that would cause a change to their previous determination.

On April 16, 2003, NMFS stated in an e-mail from Lawrence R. Peltz that nothing had changed.

On April 16, 2003, USF&WS stated in an e-mail from Jonathan Priday that, as long as there were no major revisions to the project, their former determination reflects the current situation.

On August 21, 2003, ADEC provided certification of this permit under Section 401 of the Clean Water Act (CWA).

List of Acronyms

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
DO	Dissolved Oxygen
EFH	Essential Fish Habitat
ESA	Endangered Species Act
EPA	Environmental Protection Agency
gpm	gallons per minute
MGD	million gallons per day
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQS	Water Quality Standards

Response to Comments

1. Comment: A commentor questions the concept that water itself can be a pollutant.

Response: The definition of the term *pollutant* is found in regulation at 40 CFR 122.2:

“dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*)), heat, wrecked or discarded, equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.”

The heat remaining in the water discharged from the power plant is considered a pollutant, not necessarily the water itself, and a discharge of a pollutant into waters of the United States requires a permit under Section 402 of the CWA - the National Pollutant Discharge Elimination System (NPDES) Program.

2. Comment: Numerous commentors state that the applicant failed to submit the required information [40 CFR 125.72] to apply for a variance under Section 316(a) of the CWA and failed to demonstrate that the proposed discharge would assure the protection and propagation of a balanced, indigenous population of shell fish, fish, and wildlife in and on the body of water.

Response: EPA decided that the early screening information would not be applicable to a discharge that pre-dated the regulations implementing Section 316(a) of the CWA as well as the CWA itself by such a long period of time. Early screening is interpreted to mean studies done prior to the discharge occurring because the Interagency 316(a) Technical Guidance Manual addresses only predictive demonstrations with no discussion of early screening demonstrations. Since there is no evidence of studies occurring prior to the introduction of the thermal discharge into the Chena Slough, it would not be appropriate to require predictive demonstrations to ascertain what would happen if a discharge were to occur. Consequently, EPA applied the regulation [40 CFR 125.73(c)(1)] applicable to existing dischargers and considered the information received for the Alaska Department of Fish and Game to be sufficient indication that no harm has been noted.

That is not to say that information applicable to the early screening requirements of 40 CFR 125.72(a) had not been collected during the permit development process. Below is a list of the information collected and how it correlates to the regulations:

- 40 CFR 125.72(a)(1) the permit application contained the requested thermal limits.
- 40 CFR 125.72(a)(2) since the discharge is not proposed (where there would be no historic information available as to its affects) but rather has

been occurring for over 50 years, EPA has relied on information provided by the Alaska Department of Fish and Game (ADF&G) which indicates that the requested thermal limits would not be detrimental to the standards protecting spawning areas as well as egg & fry incubation.

40 CFR 125.72(a)(3) there was confusion as to the permitting mechanism to be used in addressing this variance request. It was initially thought that ADEC was able to certify the variance into the permit under 18 AAC 70.220 so when the decision was made that EPA would have to make the variance determination, ADEC had already collected some information. EPA based its initial determination on the studies and reports referenced in the Fact Sheet. Since issuing the draft permit, more studies and information have been added as a result of research conducted to respond to the comments received during the public comment period and at the public hearing (see comment 15). The additional information is listed in the reference section of this Response to Comments.

40 CFR 125.72(a)(4) the most stringent WQS address the protection of fish so a logical representative appropriate species would be the fish present in the area, both the migrating salmon species as well as the resident grayling which spawn in the vicinity of the discharge.

The Interagency 316(a) Technical Guidance Manual allows for a Low Potential Impact Determination and from the information provided and collected, EPA determined that granting the variance for this discharge would have a low potential impact.

If the discharge had been proposed rather than on-going or there was any indication that aquatic life were being affected, the facility would have been required to conduct aquatic studies to demonstrate how the requested thermal limits would impact aquatic life. Because the discharge has been occurring for over 50 years with no adverse impacts on fish (the representative appropriate species) due to the increased temperatures in the vicinity of the outfall, EPA did not find it necessary to require studies to further support what was observed in the existing environment. EPA has added a Reopener Clause in Permit Part IV.K. This condition allows for the permit to be modified to include different effluent limitations or studies based on an evaluation of data collected pursuant to the permit.

Although 40 CFR 125.72(b) says that a detailed plan of study will be submitted, the Guidance for a low potential impact determination states that further studies are essentially whatever the agency and the applicant agree upon. The information that EPA has reviewed suggests that there is a balanced indigenous population. Therefore, the decision was to draft a permit granting the variance without requiring

further studies. As such, there was no need for a plan to be submitted.

3. Comment: Several commentors note that EPA and ADEC are directly charged with protecting quality of life, recreational opportunities (e.g. snowmobiling, dog mushing, skiing, skijoring, etc . . .) and public safety so the agencies should not deprive Fairbanks of a winter recreational corridor through town, should prevent traffic accidents caused by ice fog and should protect people from falling through thin ice.

Many commentors noted that additional winter recreation opportunities are afforded due to the unfrozen portion of the river (wildlife/nature viewing, extra boating time, etc.) and that the quality of life of residents living near the river was in fact protected by the unfrozen stretch of water (e.g. no snow machine traffic and the subsequent noise pollution).

Response: The goal of the CWA, under which the NPDES permit program is authorized, is to make the waters of the United States “fishable and swimmable.” The Water Quality Standards (WQS) which States adopt to reach this goal must contain several components including designated uses. The designated use of Water Recreation contains two sub-uses which are defined below:

Contact recreation means activities in which there is direct and intimate contact with water. Contact recreation includes swimming, diving and water skiing but not wading, and

Secondary recreation means activities in which incidental water use can occur including boating, camping, hunting, hiking, wading and recreational fishing.

The WQS are meant to protect the health of organisms we eat, the water we drink and to assure that contact with the water is not unhealthy. This permit has been issued to comply with the CWA and DEC has certified that the permit would be protective of their WQS.

The NPDES permit is not the vehicle by which to enforce ADEC’s ice fog regulations found at 18 AAC 50.080.

4. Comment: A commentor claims that a 316(a) variance is inappropriate because ducks are present in the area of the discharge during the winter and they are not indigenous to Fairbanks in the winter. Several other commentors expressed their view that ducks are a nuisance species in the winter.

Other commentors, however, expressed their pleasure at having ducks remain in Fairbanks year-round.

Response: The requirement to address a balanced, indigenous community does not differentiate between year-round species and seasonal species. Even so, no evidence has been presented that the presence of ducks in the winter are harming the rest of the indigenous populations so their presence is not an issue in determining whether a

variance may be granted. Also, the Guidance Document states that the community may include species not historically native to an area but which are species whose value is aesthetic. Several commentors make it clear that the winter time presence of ducks is an aesthetic pleasure to them.

5. Comment: Several commentors mention that the statement that the Chena River has never been the Chena River without the thermal discharge is strange or silly. They state that the dike excluding the Tanana River was built in 1941 so the river had 10 years during which the Chena flowed through Fairbanks as it does today.

Response: The original statement was made as result of the information provided in a US Geological Survey (USGS) document which states that the dike work was done between 1940 and 1945 with possible work done as late as 1947. The Fact Sheet also stated that one would not expect the Chena Slough to go from supporting an ecosystem accustomed to living in a sediment laden stream to one living in a clear water stream overnight. This may be the reason that the USGS did not change the name from the Chena Slough to the Chena River until 1952.

6. Comment: Several commentors state that thermal discharges in excess of the WQS harm fish and fish habitat. One commentor references the Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (Draft Temperature Guidance), October 2001, as stating that these temperature limits “. . . are set near the warm end of the optimal temperature range for these identified salmonid life stages . . .”

Response: EPA did state in the Draft Temperature Guidance that the temperature limits were set at the warm end of an optimal range. EPA also stated that these levels would cause few, if any effects. The full quote from the Draft Temperature Guidance in the discussion of the adoption of species-life-stage numeric criteria (which Alaska has adopted) is actually, “These numeric criteria are based on the biological needs of salmonids and are set near the warm end of the optimal temperature range for these identified salmonid life stages and at levels EPA believes will result in few if any adverse effects.”

The Draft Temperature Guidance also states that “to the extent that cold water is available, salmonids will use behavioral means to avoid harmful temperatures and maintain optimal body temperatures.” Because of the behavioral means that salmonids can use to avoid higher temperatures, the Draft Temperature Guidance states that “optimal temperatures do not have to occur everywhere all the time.”

The Draft Temperature Guidance has been finalized. It is now called the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (EPA 910-B-03-002).

Since the modeling done by Foster Wheeler, cited in the Fact Sheet, and in part duplicated by ADEC shows that there would be either a zone of passage or, by the time the thermal plume stretches the width of the river, the temperatures would not

be high enough to block passage, the variance is being allowed under Section 316(a) because only a small portion of the river is thermally affected and because by behavioral means, salmonids can avoid the immediate area of the discharge.

7. Comment: A commentor requests that monitoring be conducted by an independent outside source.

Response: The NPDES regulation at 40 CFR 122.48(b) requires that a facility's permit shall specify the required monitoring including type, intervals and frequency. While the program is considered to be self-monitoring, a facility may hire an outside source to perform this service.

8. Comment: Several commentors requested that the issue of coal and coal dust falling off the conveyor into the Chena River be addressed.

Response: A specific requirement has been added to the permit in the Best Management Practices Plan section, Permit Part I.D.5.k., to have the facility address this issue.

9. Comment: A commentor requests that monitoring be in gallons per minute and degrees Fahrenheit.

Response: These changes have been incorporated into Permit Part I.A.

10. Comment: One commentor points out several typographical errors in the permit on page 9, paragraph 2, in Permit Part III.G.1.d (10) and in Permit Part IV.J (16)

Response: These corrections have been made in the permit.

11. Comment: A commentor is concerned about the possible introduction of exotic species as a result of the thermal discharge.

Response: The power plant could not introduce exotic species since the process entails the withdrawal of water from the river, running it through the plant and discharging it back to the river. Therefore, the normal operation of the facility has no mechanism that could lead to the introduction of exotic species. It is expected that a localized change in temperature of the river would not provide a pathway for exotic species to move into the area.

12. Comment: One commentor suggests that the previous drafts of the discharge permit that were public noticed in the late 1970s were not issued because it would have been illegal to do so.

Response: The written record does not indicate why the permit was not issued. This permit has been issued to be in compliance with the CWA and certified by ADEC that it meets WQS.

13. Comment: A commentor contends that when the city's waste water treatment plant was

allowing the discharge of untreated wastewater, there was a study that followed the untreated effluent down the Chena and down the Tanana River to the Yukon River indicating that this thermal discharge could have wide ranging effects.

Response: A major difference between the discharge of raw sewage and a thermal discharge is the assimilative capacity of the waterbody receiving the discharge. With the type of diffuser employed by the facility, it is expected that the thermal discharge would be well mixed with the water and would soon cool to background levels. On the other hand, untreated sewage has components in it, most notably solids, that will not mix with the receiving water and may well be found far downstream from the discharge point. Since the thermal discharge does not act like a discharge of raw sewage, it is expected from the modeling that within 800 feet of the discharge point, the water will be cooled to background levels. A monitoring point 800 feet downstream is included in the permit to verify this assumption of the model.

14. Comment: Comments were received regarding the validity of the data collected in the Foster Wheeler report.

Response: The data collected for the draft Foster Wheeler report was collected as a means of calibrating a model to predict the behavior of the thermal plume as a result of the discharge. The modeling was conducted to predict the plume behavior during critical periods (i.e., times when the ambient temperature of the river is at its annual highest point, in the case of the Chena River June and July). The timing of the data collection was opportunistic rather than planned for a certain flow event. The fact that the data was collected during a time when the Chena River flow was 32 times the winter low flow is not necessarily detrimental to the accuracy of the model. Once the model is calibrated it becomes possible to attempt to predict the behavior of the thermal plume under varying ambient and discharge conditions. A point of confusion in interpretation of the model results may be that the draft report attempts to apply a water quality standard from the State of Washington in its analysis. To assume that the model results in an analysis of running the facility at full capacity are unacceptable may not be appropriate since the report was applying a water quality standard which does not apply. Despite attempting to apply an inappropriate water quality standard the output from the model runs still provide useful information in the prediction of the thermal plume behavior in varying conditions.

To verify the modeling results at higher ambient river temperatures and to ensure the protection of aquatic life Permit Part I.B. of the final permit will contain additional ambient monitoring during critical times.

15. Comment: Many commentors called for a study of conditions in the Chena River to determine the effect of the thermal discharge on the aquatic inhabitants of the river. Some commentors say that not enough is known about how the thermal discharge might affect fish.

Response: There have been several studies conducted to determine the affects of temperature on aquatic life in the Chena River, mainly arctic grayling.

The study, "Effects of Thermal Discharge upon a Subarctic Stream," states:

"There are some beneficial effects of having an open reach. The most obvious is allowing free exchange with the oxygen in the atmosphere. The expected result would be an increase in dissolved oxygen as the river passes through a lengthy open reach. Also one would expect a slightly warmer temperature in the vicinity of a large discharge and more livable environment for a number of biological processes. It is highly unlikely, unless the river is very small or the discharge very large, that the temperature of the river would increase enough to cause many adverse effects."

The maximum discharge (20 MGD) in combination with the lowest flows in the river (150 cfs = 97 MGD) would not provide the conditions for the discharge to overwhelm the flow of the river.

According to the study, "Effects of Thermal Discharge Upon the Chena River," the warmer water of the discharge is more buoyant than the colder water in the Chena. It would be expected that this lighter water would be suspended above the bottom of the river and then eventually mix throughout the water column. Since the warmer water will not sink to the bottom prior to mixing with the river, the temperature of the water surrounding any eggs found in the gravels should reflect the temperature of the overall system and not be drastically affected by the discharge. So spawning times should not be dramatically affected and the eggs should hatch within a normal range downstream as well as upstream of the discharge.

In the study, "Thermal Tolerances of Interior Alaska Arctic Grayling," it is noted that arctic grayling (*Thymallus arcticus*) were found to be quite tolerant of a wide range of temperatures. It is also noted that grayling are somewhat resistant to low dissolved oxygen (DO) levels even to the point of being observed in the Chena River when it was completely frozen over and DO concentrations were measured near zero.

In this study, numerous 96 hour thermal testing on grayling and coho salmon was conducted under varying conditions. It was found that grayling would not survive very long in 30° C water but this maximum temperature of the effluent will not be sustained in the Chena River. The effluent will at first become a buoyant plume with fish passage allowed on the sides or under the plume. Fish having a zone of passage will avoid spending any time in the discharge plume so initial temperatures are not a concern. Secondly, the thermal discharge will be diluted by the colder receiving water. The 96 hour testing indicates that a high percentage of fish survive in 20° C water.

According to Mike Doxey of the ADF&G (e-mail communication dated August 21, 2002), the recovery of the grayling stock, which declined throughout the Chena River drainage due to the harvest of large numbers of fish, would indicate that if there are any negative impacts from the thermal discharge, these are greatly and independently mitigated by other factors.

These studies have been conducted by independent sources and indicate that the thermal discharge may have some affects on the aquatic species inhabiting the Chena River. These affects, however, are not detrimental to the survival of the species and in some cases, the affects enhance the living environment. EPA is, therefore, not requiring any studies to be conducted during the cycle of the current permit. EPA however, will require that any studies conducted in the Chena River during the course of the permit life, including any fish surveys conducted by ADF&G, be submitted with the reapplication package for permit renewal which is due 180 days prior to the expiration date of the permit. This requirement has been added as Permit Part I.E.

16. Comment: Some commentors claim that the discharge is causing the character of the river to change with an increase in certain aquatic species such as suckers and tubificid worms.

Response: The presence of suckers in the Chena River is not in and of itself a prediction of a declining habitat for other fish. The ADF&G report, states that 14 fish species, included longnose suckers inhabit the Chena. According to ADF&G (personal communication with Mac McLean, August 1, 2002), suckers occupy a different niche so do not compete directly with grayling for habitat.

The presence of tubificid worms is usually an indication that organic materials which are associated with untreated or under-treated sewage are present in the receiving water. The source of this organic material could be older septic systems still in operation along the river.

17. Comment: Many commentors requested that the permit contain provisions to require that the energy from the wastewater be recovered and to phase out the discharge over time.

Response: EPA fully supports any efforts made by Aurora Energy to further recover energy from its discharge. The information reviewed does not indicate that the indigenous population of shell fish, fish and wildlife in and on the body of water have been impacted due to the discharge. EPA sees no reason based on water quality concerns for the permit to contain either provision.

18. Comment: Several commentors noted that requiring the power plant to stop discharging would cause its closure, having a negative impact on the economy with lost jobs at the power plant, the coal mine and the railroad. Other commentors stated that the power plant provides local, reliable power which insulates the area from larger area-wide power outages.

Response: EPA is not requiring that the power plant cease its discharge.

References

Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards. Prepared by EPA, Region 10, for public review. October 2001.

EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002, April 2003.

Effects of Thermal Discharge upon a Subarctic Stream. Prepared by Robert F. Carlson, Timothy Tilsworth and Charlotte Hok of the Institute of Water Resources, University of Alaska, Fairbanks. Undated.

Effects of Thermal Discharge Upon the Chena River. A master's thesis prepared by William Clyde Armstrong. Undated.

Thermal Tolerances of Interior Alaska Arctic Grayling. Prepared by Jacqueline D. LaPerriere and Robert F. Carlson of the Institute of Water Resources, University of Alaska, Fairbanks. December 1973..

Stock Status of Chena River Arctic Grayling in 1997, and Radiotelemetry Studies, 1997-1998. Fishery Data Series No. 98-39, Alaska Department of Fish and Game. William P. Ridder. December 1998.

Preliminary Evaluation of Aurora Energy's Thermal Discharge to the Chena River: Draft Report. Prepared for Aurora Energy by Foster Wheeler Environmental Corporation. February 2001.