

ALASKA LEGISLATURE COMMITTEE FILES 1991-1992 8672
7149 HOUSE RESOURCES

HAINES BOROUGH
RESOLUTION #324

A RESOLUTION OF THE HAINES BOROUGH OPPOSING ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION PROPOSED CHANGES TO ALASKA WATER QUALITY STANDARDS.

The residents of the Haines Borough depend upon clean, safe water for their personal health, and for the fish which make up a large part of their personal food supply.

The finfish and shellfish which hatch, rear and spawn in and adjacent to the Haines Borough must have clean, unpolluted water to continue as a perpetually renewable state natural resource, one which forms the foundation of a strong local economy in the Haines Borough.

As part of a triennial review of Alaska's water quality standards, the Alaska Department of Environmental Conservation (ADEC) is proposing to lower the present state water quality standards to allow increased concentrations of materials known to be toxic such as dioxin, arsenic, and chloroform in Alaska's waters.

At present, industrial toxic wastewater is not permitted to flow into Lynn Canal. However, if ADEC weakens standards and legalizes releasing industrial toxic wastewater into a "mixing zone", industrial contaminants would be allowed to enter the Lynn Canal waters adjacent to the Haines Borough. Such contamination could have disastrous effect upon the fishery upon which so many residents of Lynn Canal depend.

The proposal of ADEC to lower the water quality standards of this state will jeopardize the health and economic well-being of Haines Borough residents and all other Alaskans by allowing discharge of health-damaging toxic industrial wastes into streams and other waters.

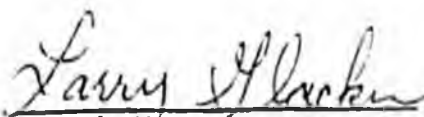
The history of water quality in the Lower 48 states shows that water quality has dangerously declined until stricter standards have been instituted. Alaska needs to maintain its high standards for water quality, not lower them.

Several industrial enterprises are requesting the lowering of Alaska water quality standards so that they may operate pulp mills, mines and petroleum facilities which seem unable to meet strict standards. While lower standards would apparently be more economical for those enterprises, lowering standards will put at risk other industries such as fishing and tourism which must have high quality water for their very existence. To put other industries at risk and to jeopardize the health of all Alaskans for the sake of a few special interests is poor policy.

For the above reasons, the Haines Borough Assembly hereby resolves to notify the Alaska Department of Environmental Conservation and the U.S. Environmental Protection Agency that the assembly opposes weakening the Alaska water quality standards during this triennial review.

Because of the potentially serious consequences of lowering Alaska water quality standards, the Haines Borough Assembly further resolves to ask the Alaska Department of Environmental Conservation to postpone the close of the comment period from September 30, 1992 to January 1, 1993 to permit adequate time for the Alaskan public to attend hearings regarding the proposal to make known their views about this very serious subject.

Adopted: at a meeting on 15, 1992


Larry Glackin, Acting Mayor
Haines Borough

Attest: Becky Mitchell
Becky Mitchell, Borough Clerk



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October 30, 1992

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Representative Cliff Davidson
House Resources Committee
112 Mill Bay Road
Kodiak, AK 99615

Dear Representative Davidson:

Ketchikan Pulp Company appreciates the opportunity to comment on the serious impact the State's Water Quality Standards will have on the citizens, municipalities, and industries of the State of Alaska. We believe there is a need to re-evaluate the regulations to assure the protection of the environment while facilitating a strong and competitive industrial economic base in the State. It is imperative that the State not only work toward a sustainable economic base with present industry, but also not jeopardize future industrial and economic growth potential.

We support many of the proposed regulation changes, and urge you to consider our justifications for strengthening and improving other standards. The following is a synopsis of our suggestions regarding several issues presented in both the current and proposed criteria.

CLASSIFICATION OF WATERBODIES

Of Alaska's more than 3 million lakes and thousands of miles of coastline, the State of Alaska has not classified the majority of marine or freshwater bodies in the State of Alaska for specific uses. While we acknowledge the impossible task of classifying all of them, the State has no plans to classify any more at the present time. If the State is reluctant to continue this practice based on time and economic constraints, then why have they worked during this

OPERATING DIVISIONS

WARD COVE PULP MILL
THORNE BAY LOG

KETCHIKAN SAWMILL
TULREAN LOG
SAGANAY LOG

ANNETTE HEMLOCK SAWMILL
EL CAPITAN LOG

PL573H

triennial review to continue to regulate water bodies for classifications under specific uses? All but a handful of water bodies in the state are responsible for meeting the most restrictive standards for each use category regardless of location or use. In most cases, this is unreasonable and puts economic, technological, and growth restraints on the many citizens, municipalities, and industries in the state.

NATURAL CHARACTERISTICS OF WATERS [70.010]

The proposed change would allow natural levels of contaminant or physical properties to be designated as the criteria for water quality when the proposed numeric criteria is less than that found naturally. This would account for nature's variability and resident species ability to adapt and perpetuate in differing ecosystems.

However, as written, it does not allow for any increase in natural background levels for those above the numeric criteria. Natural variations would be expected to fluctuate within a wide range. Therefore, it would be reasonable and protective to allow increases over background of some measurable amount.

Also, due to the enormity of natural waters that exceed many of the numeric criteria listed, the use of "departmental discretion" is inappropriate. This clause should be available for all parameters unless evidence of adverse effects on resident species is evident on a site specific basis. The applicant should be able to reasonably assume standards during planning stages without being held hostage by the "discretion" of the department.

FECAL COLIFORM [70.020.(B)II(b)(i)]

The proposed changes reflect a change in only one of the use categories for Fecal Coliform. For those of us discharging to unclassified marine waters, we must restrict ourselves to the most stringent criteria. Two use categories for marine waters (aquaculture and seafood processing) are regulated to 20 FC/100 ml.

Because use classification of Ward Cove has not been made, industry, contact recreation, and secondary recreation must still meet the 20 FC/100 ml limit. No other state regulates this parameter for these uses at less than 100 colonies per 100 ml. The level proposed

by Alaska is so low that streams in remote uninhabited areas have coliform numbers that exceed the proposed standard.

We have found no scientific support for such a standard. However, the proposed standard will probably require many dischargers to install and operate disinfection systems to meet a standard required by no state but Alaska.

COLOR [70.020(6)II(A)(B)and(C)]

Ketchikan Pulp Company (KPC) strongly rejects the need for any numeric color restrictions. Naturally occurring water color and that generated by the pulp industry is due to the release of lignin during the cooking and bleaching of wood fibers. Lignin is a natural constituent of wood and is not created by the pulping, bleaching, and pulpmaking process. Most of the Alaskan waters, including pristine headwater areas, are colored due to the presence of these naturally occurring substances.

As a drinking water standard, the State finds the color unit to be unenforceable at 15 cu for water that is treated and distributed for consumption (18 AAC 80.50). Why, as a water quality criteria, is the color limit 15 and enforceable for [70.020(b)II(B)(i)] the contact recreation use? Again, we would like to note that because the state is reluctant to classify a large number of waterbodies, all uses are responsible for meeting the most restrictive standard.

While the major argument for a color standard has been a marked decrease in photosynthetic activity, we have found strong support to the contrary. Wildish (1976) and Kiefer (1987) assumed that sunlight was absorbed by the color molecules in the effluent. However, Kiefer, as one of the country's leading modeling experts, found that the color in the effluent resulted in essentially one more cloudy day a year. The "residence time of phytoplankton within the plume is short. The shading that will occur during this time will not cause death of the cells, and it is most reasonable to expect the crop to resume normal rates of photosynthesis after dilution of the plume is complete." Higashi (1992) has found that sunlight is not absorbed by the color molecules, but is shattered into particles still readily accessible to phytoplankton in the lower depths. It is also suggested that larger molecules that absorb light do so at a wavelength different from

that utilized by the phytoplankton and therefore have little or no effect on photosynthesis.

In realizing the costs associated with a color removal system, the Environment and Natural Resources Institute suggests attempting internal process changes versus physiochemical treatment processes which must compete economically with secondary biological treatment. Internal process modifications, i.e., incorporating oxygen, chlorine dioxide, hypochlorite, peroxide or ozone into the bleaching process have potential for decreasing color. However, in introducing one or more of these to our bleach plant, KPC will be expected to undergo extensive mill modifications at an estimated cost of \$149.5 million for technology that has not been proven on our product beyond laboratory studies. Naturally, there is great economic concern to our international customers as well as the pulp industry for a product that is both affordable and dependable.

KPC has identified lime precipitation as its proposed method for color removal. This treatment is expected to cost \$45 million initially, with an annual operating expense of \$11.3 million.

The Environment and Natural Resources Institute (1992) notes that cost removal technologies are expensive and can cost as much as 10% of the value of the final pulp product. This is a considerable cost burden for a product whose market value must remain competitive. (Springer 1986)

The color restrictions proposed in the Water Quality Standards are severe and overall benefits are debatable as color is an aesthetic issue rather than a water quality one.

If the Water Quality Division is adamant about adopting numerical criteria, we ask that you take into consideration those limits placed on other pulp and paper facilities across the country. The National Council of the Paper Industry For Air and Stream Improvement Inc. (NCASI) has provided a list of seven known facilities with color restrictions. Of these, six of seven give a numeric increase at complete mixing. Only the Westvaco facility in Covington, Virginia has a numeric requirement of 800 cu at less than complete mixing.

The State of Maine has adopted a numerical limit after extensive review. Many feel that Maine is one of the few states to develop color standards for pulp mills

"that are reported to be realistic and protective as well as economically feasible" as noted by the Environment and Natural Resources Institute (1992). Maine has established an increase at a point of complete mixing.

Understanding the inherent definition of Water Quality Criteria and the limited relief from the "mixing zone", KPC proposes a second mixing zone. The second mixing zone is established by the natural parameters of the locale, of which the boundary marks a point of complete mixing where some water quality criteria, i.e. color should be monitored. A natural mixing zone will always be different due to dependence on flows and makes it impossible to define a constant monitoring point. Mixing zones should be considerably larger than the theoretical complete mixing point to allow for inherent site conditions and sampling variability. We note that in establishing any color limit, the state must first allow background testing dependent on seasonal and atmospheric variances that markedly affect this standard.

MIXING ZONES [70.032]

The proposed mixing zone articles are contradictory or illogical as stated. A clear and usable definition of the mixing zone with criteria for sizing the zones are essential so that ADEC, municipal and industrial staffs can plan and make progress on project permitting. At present, the standards allow for an unnecessary amount of department discretion which will greatly tax staffing, time constraints and expansion plans of both the department and the applicant.

Specifically:

1. Mixing zones should be limited based on pollutants which would bioaccumulate in food chains, or concentrate or persist in the environment [70.032(a)(1)]. Note that some metals are essential nutrients (i.e. vitamins and minerals) and are bioaccumulative. To have restrictions at end of pipe for all pollutants that bioaccumulate will be counterproductive if no adverse effects are realized.
2. The 10% sizing criteria are somewhat arbitrary and will result in non-uniform mixing zones [70.032(e)(2)]. The concept is inflexible and does not take natural parameters of the receiving water into account. We suggest a mixing zone that

can assume any cross-sectional shape not to exceed 10% of the total cross-sectional area.

3. A mixing zone should alter the use classification of the receiving water body within the mixing zone [70.032(e)(3)]. The department should allow for a temporary, localized or repairable impact. Note that this section, without allowing for temporary, localized or repairable impact, severely limits the department's ability to provide for any mixing zone since it is reluctant to continue to classify water bodies. With this reluctance, most all dischargers would have to meet drinking water standards within their mixing zones. As such, the department negates any plausible justification for allowing mixing zones.
4. The standards should clearly identify what information the applicant should provide to the department for application or should provide a time constraint for the department to transmit necessary information required for application completeness [70.032].

In an October EPA-DEC meeting, EPA concurred with the need for mixing zones. They versed frustrations with regard to the contradictory criteria proposed and emphasized the need for clear, concise guidelines.

PETROLEUM HYDROCARBONS, OILS AND GREASES [70.020]

The state's proposed water quality standard for total aromatic hydrocarbons is 10 ppb. No other state has water quality standards for these substances in the ppb range. Four states have a 10 ppm standard, and another has a 1 ppm standard. Most states, however, do not regulate these substances. Many states have oil and grease limitations that range from 10-75 ppm with 15 ppm being the most common. Alaska's 10 ppb TAH standard is one thousand time more restrictive than any other standard.

In addition, the test for TAH was developed by the petroleum industry. It is scientifically inappropriate to use it in regulating aromatic hydrocarbons specific to other industries or activities.

It has been suggested that the BTEX method will be used to measure petroleum based compounds. The majority, if not all, of these measured compounds are already restricted by human health criteria. Why, then, is the department restricting them further?

We suggest the section continue to regulate use classes based on the wording [70.020(b)II(A)(ii)] for seafood processing which addresses visible film sheen, or discoloration on the surface or floor of the waterbody and shoreline. It provides narrative limits for floating oils, odor and taste. Other impacts of petroleum products are sufficiently limited by the restrictions of Toxic and Other Deleterious Organic and Inorganic Substances.

HUMAN HEALTH CRITERIA

EPA specifies human health criteria for three risk levels, 10^{-5} , 10^{-6} , and 10^{-7} . The default risk level for all the toxic "priority pollutants" for which EPA has published water quality criteria has been 10^{-6} .

As one of the original 22 states that failed to adopt a risk level for carcinogens, Alaska will be subject to the National Toxics Rule (NTR). NTR is considered highly controversial. The Office of Management and Budget has continually questioned EPA's cancer risk levels and believes this criteria should be established by the states. In ADEC's Regulatory Issue Paper: Human Health Criteria for Dioxin, the State of Alaska emphasizes their reluctance to adopt criteria under the 10^{-6} blanket set by the NTR for several reasons. First, the risk level of 1 in 1,000,000 is considered unnecessarily conservative. Secondly, only a small subset of the population is exposed to the "risk" as defined by the rate of water and fish consumption in both volume and lifetime behavior. Third, pollutants vary greatly in their mobility, bioaccumulation and toxicity. Fourth, the prevailing model used to assess cancer potency is now widely believed to be inappropriate for some pollutants as discussed by the Center for Risk Analysis (CRA).

The State is also limited by an "anti-backsliding" provision of the Clean Water Act which makes later relaxation of the criteria based on new scientific information and evaluation difficult or impossible. This provision puts the onus of responsible regulation on Water Quality Divisions since it could set standards for administrations of the future.

EPA has established a risk level of 10^{-4} to 10^{-6} for all pollutant risk criteria according to EPA's Department of Risk Assessment. The Office of Solid Waste and Emergency Response operates under the premise that where the cumulative level carcinogens is less

than 10^{-4} , action is generally not warranted unless adverse human health effects are noted. Therefore, in establishing a 10^{-5} standard, EPA allows for an excess of 10 human health criterium restrictions. In establishing a 10^{-6} standard, EPA is regulating for an excess of 100 human health criterium restrictions, etc.

KPC strongly urges the State to adopt a 10^{-5} risk level for this "priority pollutant" list. Only then will ADEC have an opportunity to review individual pollutants while providing ample protection for citizens of the State.

KPC applauds the proposed state standards for dioxin, arsenic, and chloroform and hopes to see similar based research approaches to this "list" (i.e., trichlorophenol and manganese). As an example, some primary issues of concern are the fact that metals in water exist in many different forms: dissolved, attached to particulate matter, or incorporated within particulate matter. These different forms vary in their biological availability and toxicity making the same metal concentration more toxic at one time and place than another. KPC endorses any attempts to measure and regulate dissolved metals in place of total or total recoverable metals.

While the public has voiced concern at DEC's low fish consumption rate, EPA upheld DEC's apparent use of contaminated fish consumption rate as a percentage of the total consumption rate. This policy is practiced by the FDA.

MANGANESE STANDARDS

KPC has been restricted to a 100 ug/l limit discharge of manganese at end of pipe (no mixing zone) for a metal that could be shown to bioaccumulate.

The only reference for a numerical limit for manganese that can be found was first appeared in EPA's Red Book.

This limit is taken out of context and cannot be justified for several reasons. First, manganese has shown to bioaccumulate only in marine mollusks. No marine mollusks exist at the end of our pipe because of the freshwater environment introduced by the effluent. Secondly, the limit in the Red Book is specifically for "protection of consumers of marine mollusks." Since marine mollusks do not exist at end of pipe, and since marine mollusks are not harvested at end of pipe or in

Ward Cove for wholesale consumption, then it is unduly restrictive to base this criteria on consumer protection protocol. Therefore, a population that is expected to exist solely on mollusks from the area at the "end of pipe" over a 70 year lifetime exposure is completely unrealistic. A more realistic approach would be the application of human health criteria beyond a mixing zone boundary.

TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES [70.020] AND CHRONIC TOXICITY OF AN EFFLUENT [70.023]

Published (ASTM) procedures for conducting the bivalve embryo/larval test are available. However, there are still important test parameters which vary from laboratory to laboratory that may influence test results. The lack of inter and intra-laboratory precision data makes it difficult to determine the adequacy of the general test procedure. Data is also limited for defining the relevance of this test as a monitoring tool for receiving water biota.

NCASI Technical Bulletin No. 638 gives in-depth discussion of important protocol variables revealed in the study of the Bivalve embryo/larval test. This test is considered one of the more sensitive marine chronic bioassays.

Final protocol for conducting the echinoderm sperm/egg bioassay has not been issued for the West Coast due to several disputable issues in the test procedure. The experience of most laboratories indicates precision and sensitivity variances are due to procedural variables. Two to four fold differences have been seen. "Until these parameters are better understood and defined, the test will lack suitable precision to be appropriate for use in discharge permits." (NCASI, No. 627, 1992)

NCASI Technical Bulletin No. 627 provides in-depth discussion on the aspects of test procedures which might influence sensitivity or precision. A comparison is provided in this bulletin. (Review of these two bulletins will indicate that the IC15 and IC25 are used to determine statistical variability instead of the inappropriate NOEC.)

Under the current State Water Quality Criteria, there is no water within the state that can consistently meet the limitations proposed. Important protocol variables that must still be addressed for both the bivalve embryo/larval and echinoderm sperm/egg bioassay are noted below.

Representative Cliff Davidson
October 30, 1992
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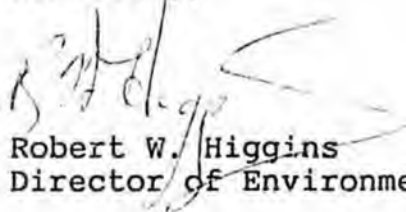
1. Broodstock handling
2. Spawning Technique
3. Gamete enumeration and handling
4. Time limits for spawning
5. Timing of test stocking
6. Sperm pre-activation in seawater
7. Incubation time and temperature
8. Sperm and egg exposure times
9. Endpoint determination

Ketchikan Pulp Company has also provided testimony from Dr. Gary Cherr of the University of California, Davis Bodega Marine Laboratory. His research has centered on the use of early life stages of marine organisms for toxicological study. His comments on the use of early life stage bioassay are enclosed.

As a final note, NCASI states "that to this date, no data have been generated by EPA or others to address the important questions of the relevance of laboratory bioassay results to the health of marine ecosystems."

We strongly believe the proposed revisions will greatly impact the State's economic base. It is every citizen's goal to attempt to obtain regulations that will protect the aquaculture and beauty of the State's waterbodies while facilitating the State's economy and population. We believe our suggestions, based on good science, protect the environmental and economic future of this state.

Sincerely,



Robert W. Higgins
Director of Environmental Control

/cmg

Enclosures

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**Testimony Relating to the State of Alaska's Proposed Water Quality
Standards**

Submitted on Behalf of the Ketchikan Pulp Company

by

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21 September, 1992

Introduction

The following testimony summarizes the oral comments made to the Alaska Department of Environmental Conservation at the 5 August, 1992 public hearing on the revisions to Alaska's Water Quality Standards in Ketchikan. These comments were prepared by Dr. Gary N. Cherr, Research Biologist, University of California-Davis Bodega Marine Laboratory, and are being submitted on behalf of the Ketchikan Pulp Company. As someone who has a strong background in basic cell and developmental biology, and who utilizes these early life stages of marine organisms routinely for his basic and applied research, Dr. Cherr generally supports the goal of using developing organisms as tools for pollution monitoring. The following are Dr. Cherr's views on the use of early life stage bioassays for estimating "chronic" toxicity in aquatic environments.

Technical Issues

These systems rapidly undergo growth and differentiation during development; as such, they tend to be more sensitive to the effects of pollutants than adult organisms. Nevertheless, it should be stressed that these early life stage toxicity tests are often simply surrogates for true chronic bioassays (eg. long-term growth and reproduction tests), and are more accurately characterized as short-term lethal/sub-lethal, or even acute tests.

While the eventual incorporation of these toxicity tests in environmental monitoring programs is an appropriate goal, current bioassay protocols for marine organisms are still in the development stage and will require additional research. The need for this research tends to be as a result of the scientific and regulatory communities' state of knowledge regarding these systems, rather than inherent deficiencies in the systems themselves. There are a number of technical issues which are as yet unresolved, and these issues (some examples of which are outlined below) can and should be addressed through additional investigations prior to implementation of these chronic bioassays for routine testing.

The Department of Environmental Conservation may wish to define chronic toxicity clearly, with respect to different organisms and life stages. A pollutant which is toxic to one organism at a particular life stage may have little impact on different life stages of the same species, or to other organisms. The State of Washington Biomonitoring Science Advisory Board surveyed all available marine chronic toxicity tests which were "beyond a basic research phase", and found 3 that were worthy of

consideration. Of these, two were the echinoderm sperm cell toxicity test and the bivalve embryo test. These two toxicity test organisms would be found in Alaskan waters, and thus may come under consideration by the Department of Environmental Conservation. The Washington state variability study will provide information on interlaboratory variability with complex effluents and, at the very least, point out where future research priorities should be. The Department of Environmental Conservation may find it useful to monitor the results of this study.

Some key issues relating to chronic toxicity are described below, and examples are provided:

A) Availability of Species and Seasonal Substitutions

The Department of Environmental Conservation is considering an echinoderm sperm cell toxicity test as one of the possible chronic bioassays which may be utilized. This toxicity test is a good example of recently developed marine chronic tests which would require additional evaluative research and peer review. EPA has not issued a protocol for a west coast species, however one is currently under development and has been circulated in draft form. This is a protocol specific to the purple sea urchin (*Strongylocentrotus purpuratus*). In many regions of the Pacific Northwest, this species is only reproductive for 5-8 months; this obviously presents a problem for utilization of this system in a monthly monitoring program. Furthermore, the EPA draft protocol is significantly different from the EPA protocol for the east coast sea urchin (*Arbacia punctulata*). Although other west coast echinoderms could be available as substitutes for the purple sea urchin, EPA protocols for these are not yet under development. Such issues as comparative sensitivities, gamete handling procedures, test exposure regimes, etc. have yet to be comprehensively addressed in other species, and would need to be established prior to recommendation of a substitute(s).

A similar problem exists with bivalve embryo toxicity tests. While oyster embryos are available much of the year from oyster growers, there are times when other bivalves will have to be substituted due to reproductive seasonality. Although mussels are a recommended bivalve species (ASTM), the test protocols between oysters and mussels vary (with respect to test temperature), and sensitivity comparisons are almost entirely lacking.

B) Variability

Marine chronic toxicity tests have received little complex effluent testing and have only recently been used for interlaboratory variability studies. The thorough investigation of these issues is generally considered a pre-requisite to implementation of a

given toxicity test protocol. Initial variability studies with early life stage toxicity tests have generally indicated that significant variability is commonly observed. Since protocol issues bear heavily upon variability (both inter- and intralaboratory), it would appear that refinement of test protocols would be a pre-requisite for routine monitoring.

A commonly utilized toxicity test in the Pacific Northwest is the bivalve embryo assay (oyster or mussel). While this bioassay has been the subject of more extensive research than the sperm cell toxicity test, it would appear that variability issues require further attention. For example, there has been recent confusion over the quantitation of the recommended (ASTM protocol) endpoint, which takes into account a combined value for abnormal development and mortality. Unfortunately, at the present time, a decrease in the number of embryos from any given test chamber is defined as mortality solely due to the toxicant. Since the actual number of embryos in a given test chamber is never quantitated at the start of the bioassay, a quantitation at the termination of the test followed by a comparison to the number at the initiation of the test is statistically invalid. Any discrepancies in the numbers of embryos may simply represent pipetting variability or error during the introduction of embryos at the initiation of the test. Since variability in pipetting certainly must occur to varying degrees, the inclusion of the "mortality" endpoint with the development endpoint will introduce variability in test results. This in turn reduces the resolution of the bioassay to detect subtle bioeffects as a result of toxicant exposure. It would certainly appear that such issues could be resolved with the appropriate effort.

C) Physiological Considerations

A variety of protocols for sperm cell toxicity tests have been suggested in the peer reviewed literature, and have been actively debated for the last 4 years. The differences in these protocols have primarily been issues such as sperm exposure time, control fertilization rates, pre-dilution of sperm, etc. It will be some time before a final west coast echinoderm sperm cell protocol is available for routine testing.

As mentioned above, bioassays such as the sperm cell toxicity test are surrogates for true chronic tests. In the environment, fertilization occurs within minutes of gamete release, and sperm metabolically decline within 20 min. following their release into seawater; this has been documented extensively in the scientific literature. In contrast, most of the current toxicity testing protocols for the sperm cell test require 60 min. sperm exposures prior to fertilization. This extreme deviation from physiological normality underscores the fact that this type of surrogate toxicity indicator may have no relation to receiving water impacts or to the reproductive biology of echinoderms. Furthermore, the

bioassay is measuring the combined effects of metabolic senescence and toxicant exposure.

D) Statistical Endpoints and Receiving Water Relevance

Current early life stage tests are commonly known to be susceptible to interferences such as the quality of dilution water sources. Although field validation has been recommended by EPA, such problems with dilution waters make this a difficult task, since reference site waters often are determined to possess some "toxicity". Once again, receiving water relevance of the tests comes into question.

Statistically derived endpoints (such as the IC15 or IC25) appear to be more appropriate than the NOEC. Determination of the NOEC is dependent on the dilution series used in bioassay testing, and is often poorly resolved when testing highly variably effluents. Since the IC15 or IC25 take the entire dose response into account, they are less dependent on the actual dilution series used. Furthermore, EPA Technical Support Document For Water Quality-based Toxics Control (EPA/505/2-90-001, March, 1991) suggests that the NOEC is analogous to the IC25.

Summary

The development of toxicity tests using early life stages of marine organisms should be more thoroughly investigated. However, There are concerns over the implementation of these for routine monitoring until some key issues are addressed. These include: A) research on seasonal substitution of species is completed, B) variability issues, including interlaboratory precision data for complex effluents, C) physiological considerations within the protocols are addressed, and D) some level of receiving water relevance is considered, and the statistical endpoint is reconsidered. Clearly, additional basic research and applied studies may be necessary for these chronic toxicity tests.

The Department of Environmental Conservation may find it useful to track the current variability study in Washington and to establish its own science advisory board such that problems which have arisen in other states which have implemented early life stage marine toxicity tests are avoided.

Personal Background

Dr. Cherr is presently a research faculty member at the University of California, Davis Bodega Marine Laboratory, and has been in this appointment since 1986 (see attached curriculum vitae). He has over 35 peer reviewed publications on a variety of topics in cell and developmental biology. Of these, 11 publications deal directly with the use of early life stages of marine organisms for toxicological study. Eight of the 11 publications have utilized echinoderm sperm cell or mollusc embryo toxicity tests, two tests recommended as potential monitoring tools by the EPA and western states.

In addition to his research activities at the University of California at Davis, Dr. Cherr currently serves on the Biomonitoring Science Advisory Board for the Department of Ecology, State of Washington. This Board has designed and helped implement a variability study on chronic marine bioassays, which was just initiated. He also serves as an advisor to the federal Northwest Regional Marine Research Board, which is under the auspices of Washington State Sea Grant. This Board is developing a plan for the Pacific Northwest Region on long-term priorities for environmental and toxicological research.

October 2, 1992

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Cliff Davidson
Chairman, House Resources Committee
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P. O. Box V
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Dear Chairman Davidson and Committee Members:

Prior commitments prevent me from being present at your hearing on DEC's Draft Water Quality Regulations. The following are some of my observations on the draft regulations for inclusion into your hearing minutes:

- * The proposed regulation provisions appear to be substantially more realistic than the present ones. They would actually be based on use and science rather than emotionally driven as the present regulations clearly are - largely escaping the approach that zero tolerance is the only acceptable level.
- * DEC should have no authority to do anything else but recognize naturally occurring stream characteristics as valid. It is not viable to say that DEC has the latitude to require that a stream be kept clearer or cleaner than it naturally occurs!
- * Allowing no increase above background levels for settleable solids is still overly stringent. Increased sedimentation that is not be so severe as to preclude designated uses of a waterbody should fall under the "no harm, no foul" category.
- * Tests such as the Von Imhof test may be easy to perform in the field, but each such test requires over one hour of time on site. I seriously doubt that the tangible benefits justify the costs.
- * Proposed standards for fecal coliform bacteria are much more realistic based on human health considerations. I suspect that the vast majority of the public would be astounded at the high naturally occurring levels of coliform bacteria found in most of Alaska's "pristine" streams.
- * I am concerned over the blanket adoption of whatever whims the EPA might undertake with respect to "Quality Criteria for Water" in the future. These are the same folks who decided the state must protect any use of a water body, regardless of its present or likely future uses, unless the applicant could absolutely prove that such future use would be scientifically impossible based on current technology - not cost effectiveness, but technology regardless of cost.

* The proposed color standards still appear to be aesthetic rather than health driven. The fresh water standard should be reworded to match the wording proposed for marine water.

* There has to be recognition given for mixing zones that differentiates between sewage discharge pipes and log yarding, for instance. The measure of water quality changes should be taken at the first point of beneficial use downstream from the source of "contamination" with some minimum distance spelled out, such as the 300 feet.

* Throughout the draft regulations the term "could" appears repeatedly. More appropriate language would be "is likely to result in". "Could" is a zero-tolerance term and should be eliminated wherever it is found.

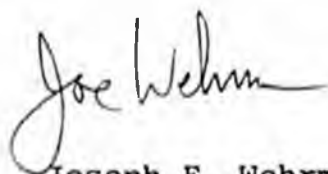
* The burden of proof falling on the operator with the possibility of modelling and computer simulations being required by DEC can easily result in a complete disregard for cost-effectiveness. I could not find any reference to cost-effectiveness in the draft regulations. Cost-effectiveness should be there in bold print at the front of every regulation any governmental body adopts!

* 18 AAC 70.110(46) puts pretty much every drop of water in the state under these rules. This definition is overly restrictive and should be changed. Intermittent and seasonally flowing streams should not be covered. Neither should impoundments where the water does not normally flow, or is used, off the property.

* It is not reasonable to apply settleable solid criteria to a stagnant swamp or intermittent stream that infiltrates through the soil surfacing later in a clean condition. This has been routinely referenced during DEC inspections of logging areas as a violation of water quality standards, yet it has absolutely no impact on downstream or off-site uses. The definition of water is the best place to fix this error.

Thank you for the opportunity to provide these comments. Overall the proposed revisions are much better than the ones they are designed to replace. I only hope that they can be further modified to protect the options to develop Alaska's resources in a cost-effective manner, without precluding the uses of the waters around the state that our residents are so accustomed to.

Sincerely,



Joseph F. Wehrman III
Governmental Relations Forester

Testimony of Gershon Cohen
State Water Quality Standards Revisions
House Resources Committee, 10/3/92

Mr. Chairman and members of the committee;

During this hearing we will enter into detailed scientific discussions of the proposed regulations, and while that information is of utmost importance to your evaluation, I would like to speak for several minutes to another important aspect of this discussion; a citizens right to be informed, and his or her ability to contribute to the formation of public policy.

On July 9th, I attended a DEC/Kensington Venture workshop in Haines. Late in the evening, Mr. Sturdevant from DEC, introduced himself and stated that DEC was in the process of revising the WQS, that some of the proposed changes would effect the Kensington mine permit, and that the process was being expedited to reduce the amount of time before permits could be issued to the Kens. and AJ mines, and the pulp mills in Sitka and Ketchikan. We were also informed that the public comment period, which was already in progress, would close on Aug. 10th. At that time, there were no information packets in Haines. Approximately two dozen people requested packets, which arrived July 20th. A brief examination of the revisions and their implications, showed that 3 weeks was far too little time to analyse and produce responsible commentary, on this 127 page document. A strong public outcry resulted in an 11th hour extension by DEC, that due to public notice requirements reset the closing of the comment period to Sept.30 th.

On July 23rd, I gave testimony at the public hearing in Juneau, stating that the scientific analyses presented by DEC appeared to have significant flaws, that the cited references were strongly biased, and that the comment period was still too short to allow for an adequate public review.

In the ensuing weeks, a citizens group, called the Alaska Clean Water Alliance, representing a variety of industries, environmental groups, native organizations, private businesses, and public health professionals, was formed to address the proposed revisions of the WQS. As we began to research information on the technical aspects of the regulations, we found that the timing of events indicated that the permitting requirements were being developed before the scientific analyses of the revisions had been completed, or in some cases, even begun.

On April 7th the draft NPDES permits were released by EPA to Dec and the pulp mills in Sitka and

Ketchikan. These permits were to be based on the current DEC reg.'s where they applied, and on EPA standards where no state std. existed. In reaction to the requirements of these draft permits, a series of meetings began between DEC/EPA/DGC/Mill representatives/and the AG's office, beginning on April 9th, to determine what steps would need to be taken to produce new operating permits that would be technically achievable by the pulp mills. The result of these meetings is summarized in this document entitled "EPA Table of Potential Compliance Remedies". The first remedy listed under nearly every pollutant is - maximize the mixing zone (MZ). The present mixing zone language in state regulations does not allow this, and the pulp mills expired permits contained no MZ provisions. The second remedy listed is the revision of the WQS. The third remedy, facility modification, is listed as a last solution to complete the necessary changes for compliance, or is listed as N/A.

By the end of June, the fact sheets, questionnaires and proposed revisions were completed by DEC, and the official public comment period was begun. In late August I requested copies of the questionnaires and comments from the peer review group chosen by DEC. I received these in early Sept., but without any documents on the dioxin or arsenic fact sheets. I was later informed that these fact sheets, which contain the formulas and criterion used to determine the allowable discharge of these pollutants were written just prior to the completion of the revision packet, and that DEC had still not received any peer review information on these proposals.

ACWA continued to obtain scientific literature from the leading researchers across the country, several of whom are currently under contract to EPA to provide data for the EPA's reassessment of dioxin. This recent literature, which encompasses the last several years of dioxin research, shows that the carcinogenic effects of dioxin, as serious as they are, may be of secondary concern to the extremely low concentration, noncarcinogenic effects of dioxin on the immune and reproductive systems. Dioxins toxicity is being demonstrated in the laboratory at dilution levels that would be virtually impossible to detect in the environment, and the intent of the EPA is to totally eliminate the production of dioxin type compounds. DEC was asked why they were not considering this noncarcinogenic data, and indeed proposing to raise the legal level of dioxin release by >85 times the EPA standard. The response was that in the past, the EPA had only considered the carcinogenic effects of dioxin. Yet in a DEC summary of the April 16th meeting in Seattle, it states "Latest word on EPA review of dioxin standard

is that it will probably not go down. Reproductive and immune response effects have been found, greater than carcinogenic effects". This information was not included in the material released by DEC to their peer reviewers or to the public.

Perhaps the most serious omission from these fact sheets, is the inadequate discussion of the cumulative impact on aquatic life and human health created by the lowering of all of these standards simultaneously, which will be far greater than the effect that any of these toxic compounds would create on their own.

On Sept. 24th, the Haines public hearing was held. More than 80 people came, over 50 signed up to testify. These people were tired of hearing that the fate of their fishing industry, their tourism industry, and the safety of their subsistence harvest were going to be decided by an agency that despite repeated objections, was determined to factor into their equations that the people of Haines ate 5 lbs. of fish/yr., and that they should accept without choice a 10 fold increase in their risk of getting cancer. After < 1/2 hour, they were convinced that their input would have no effect on these regulations, and were told that if they had policy questions, that they should direct these to higher DEC officials at some later date. So when one of the few local fisherman that has had the opportunity to testify because of the timing of the hearings, suggested that the strongest statement that could be made to our government was to walk out of the hearing, the entire body got up and left. A copy of the EPA report on that hearing is in your packet.

These proposed regulations will greatly change the pollution impacts of ongoing and planned future development. It is not the position or intent of ACWA to create permitting difficulties for the pulp mills, or the mines. This is not a jobs vs. environment issue. The technology exists for the safe operation of both the mining and pulp mill industries, AND the maintenance of the pure water so necessary for the other industries that support our economy.

It is the clear mandate of the DEC to regulate and plan activities in our environment that protect the health and welfare of all Alaskans. We therefore recommend that DEC withdraw these revisions, adopt EPA guidelines where Alaska does not currently have a standard, and undertake a new, more realistic investigation of the scientific literature, AFTER scheduling hearings to enable an accurate assessment of public sentiment on the most important policy decisions for our future.

Thank you,
Gershon Cohen

Substances should not individually or synergistically cause toxicity.

Water Quality Standards

The revisions proposed by the ADEC would not adequately protect human health because they do not consider cumulative exposure to toxics, and because they are based on faulty assumptions. Human Health Criteria (e.g. for arsenic, chloroform and dioxin) should be based on all routes of exposure, a fish consumption rate of 1 to 2 pounds per day, and on an individual weight of not more than 50 kg.

Petroleum Hydrocarbons

The revisions proposed by the ADEC would allow increased petroleum pollution to our water, because they leave loopholes in testing methods, and allow too much department discretion. What does "virtually free" mean? No detectable increase above natural levels of petroleum hydrocarbons should be allowed in bottom sediments. The state should not have to prove deleterious effects; anti-degradation should apply. Numeric or qualitative limits should not be deleted unless replaced, e.g. with new oil & grease and a "total petroleum hydrocarbon" standards.

Groundwater

The proposed regulations would protect groundwater less than surface water. Surface water is a topographic expression of groundwater. In many cases, they are indistinguishable. Anti-degradation should apply to groundwater.

Groundwater should be protected for all beneficial uses, not only human health (e.g. recreation, wildlife, agriculture, aquaculture if tapped or feeding surface waters with these uses). Beneficial uses and natural water characteristics should be determined before allowing any discharge to ground water, to ensure that existing and potential beneficial uses are protected and that the anti-degradation policy is complied with.

Mixing Zones

Mixing zones should only be allowed as a variance to the rule of anti-degradation and reduction at the source. Minimum criteria for variances should be specified, not vaguely subject to "department discretion." Prevent significant or potential risk to human health or ecology. Acute toxicity limits should be enforced within the mixing zone (e.g. at end-of-pipe).


Mixing zones should not be allowed above the lower low tide level or in groundwater, where mixing is negligible. Mixing zones should only be allowed for contaminants which dissipate (e.g. chlorine) or regenerate (e.g. dissolved oxygen), and not for contaminants which could accumulate in the receiving water or sediments, plants, and organisms to toxic levels, such as pesticides, heavy metals, salts. For example, mixing zones should not be allowed for dioxin or arsenic.

Definition of "Water"

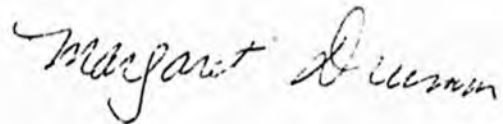
Do not change the definition of water. Any body of water which is not completely contained and isolated from the environment should be considered a water of the state. No exception should be made for impoundments and other surface water bodies that are not completely contained. These all have potential to pollute surface and ground waters of the state, and pose a threat to human health and ecology (e.g. wildlife).

If you have any questions regarding these comments, please contact Margaret Drumm at this office.

Sincerely,



Carl M. Hild, M.S. Sci. Mgmt.
Executive Director



Margaret Drumm
Environmental Engineer

Enclosures:

Attachment "A" -- Comments on Proposed Revisions to 18 AAC 70
Selected ADEC Questionnaires
Memo, Toxicity Testing Requirements

cc: State Reps. Brown, Ulmer, and Maynard
Governor's office
EPA Region X, EPA Water Division Director, Charles Findley
Anchorage Daily News, Kim Ferraro

ATTACHMENT "A"

Comments on Proposed Revisions to ADEC Water Quality Standards

Our recommended revisions are shown below compared to the current existing regulations, rather than to the proposed revisions, except where the proposed revisions have no corresponding section in the existing regulations. Underlined text are recommended additions. Text which has been crossed out are recommended deletions. Explanations of our recommendations are italicized. References are provided to Title 18 of the current Alaska Administrative Code, Chapter 70 (18 AAC 70).

18 AAC 70.010.

(a)-(b) (no changes)

(c) If the natural characteristics of a water are of lower quality than the water quality criteria set out ~~exceed the numeric water quality criteria for the use classes~~ in 18 AAC 70.022 and 18 AAC 70.022, the department ~~may will~~, in its discretion, ~~administratively~~ approve the natural levels as the applicable water quality criteria for that water ~~for corresponding use classes~~.

The wording of the proposed revision is not clear. The existing regulation, 18 AAC 70.010 (c) already provides for anti-degradation. In the proposed revision, the inference seems to be that anti-degradation would only be enforced if the department chooses to, without specifying any criteria, which conflicts with the anti-degradation policy. The proposed revision should be reworded to clarify that it will uphold the anti-degradation policy.

(d) (e) Water with natural characteristics of higher quality than the water quality criteria for the use classes set out in 18 AAC 70.020 must be kept at the existing quality, unless the existing water quality is already degraded by man-made activities to a level below that needed for its existing and potential beneficial uses, in which case the water should be protected to what its natural water quality would be, or unless an applicant for a permit issued or certified under 18 AAC 15, an applicant for a short-term variance issued under 18 AAC 70.015, or a petitioner for a reclassification under 18 AAC 70.055 shows to the department's satisfaction that

(1)-(3) (do not revise)

(e) (d) (no changes)

18 AAC 70.020(b)I(B)(i) and II(B)(i) for FECAL COLIFORM BACTERIA

(Revise as proposed)

18 AAC 70.020(b)I and II for ~~SEDIMENT~~. Change to TOTAL SUSPENDED SOLIDS.

Revise to read:

No measurable increase in concentrations of total suspended solids above natural conditions

The proposed revision is to regulate settleable solids instead of sediment. The proposed revision would miss the portion of "solids" which is small enough to remain in suspension for extended periods of time. (Total dissolved solids are regulated separately. Turbidity is related to sediment and is also regulated, but is not a direct measure.) "Total suspended solids" should be regulated instead of, or in addition to, "settleable solids," or regulate "non-settleable solids" in addition to "settleable solids," so that no portion of water-borne solids is overlooked.

Total suspended solids are defined in Standard Methods for the Examination of Water and Wastewater, 17th Edition. This definition could be inserted or referenced in section 110 of this chapter.

18 AAC 70.020 (b)I(A)(i)--TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES

I(A)(i) (Do not revise)

Criteria for surface or ground water should depend on existing and potential beneficial uses, not on the source of water. These water quality criteria were developed to protect beneficial uses and must therefore be based on beneficial uses, not on whether the water source is groundwater or surface water.

In some cases, groundwater feeds surface water. This can be determined for each body of groundwater, and should be addressed under "Classification of State Waters" in 18 AAC 70.050 (b). Until such a determination is made, groundwater should be assumed to have the same potential beneficial uses as surface water, and be protected to the same level.

There is no scientific or economic basis for allowing more degradation in groundwater than would be allowed in a surface water with the same beneficial uses. If anything, pollutants are typically more persistent in groundwater due to less mixing, dispersion, and dilution, less aeration and biological activity, and soil which can alternately adsorb and release contaminants. Moreover, pollution in groundwater is more difficult to clean up for the same reasons and because of limited access and limited knowledge of the geohydrology.

It is a separate topic to determine which beneficial uses

apply to which bodies of water, and to establish what the natural water quality level is for each body of water. Beneficial uses of state waters are classified in 18 AAC 70.050, and the anti-degradation policy addresses protection of natural water quality levels in 18 AAC 70.010. New proposed policies towards beneficial use classification and anti-degradation should be clearly stated in the appropriate sections, not randomly interspersed throughout the chapter, which leads to undue confusion and conflicting interpretations. Where data is available to establish a natural water quality baseline for a specific body of water, this could be incorporated into another section in this chapter; however, without such basis, no sweeping generalizations should be made that allows more pollution of groundwater than of surface water.

18 AAC 70.020 (b)I(A)(iii) & (C), & II(A)(i), (C), & (D)--TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES

Modify proposed revision to read:

Individual substances shall not exceed criteria cited in EPA, Quality Criteria for Water (See Note 5) or Alaska Drinking Water Standards (18 AAC 80), whichever is lower. Individual substances shall not be present individually or in combination at levels which cause toxicity, mutagenicity, carcinogenicity, teratogenicity, or bioaccumulation to toxic levels exceed criteria, established at the department's discretion, based on the "No Observed Effects Concentration" of chronic toxicity as determined through toxicity testing of sensitive and biologically important life stages of resident aquatic organisms, using methods approved by the EPA or other methods approved by the department. Substances shall not be present or exceed concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms as determined by either bioassay or organoleptic tests (See Note 5). ~~Applicable water quality criteria for groundwater are the human health criteria for carcinogens and noncarcinogens, set out in EPA Quality Criteria for Water, including the modification to certain of EPA's criteria set out at 18 AAC 70.022.~~

Receiving waters should be protected against toxicity both from individual substances, and synergistic effects of substances in combination.

No toxicity should be allowed. Chronic toxicity testing can be used to measure toxicity and to determine the "No Observed Effects Concentration." This level should be used to calculate toxicity limits, using appropriate safety factors and following EPA guidelines. It is less important that the specific testing method be codified since this is subject to continual change as testing methods are improved; it is important that the regulations do not allow toxicity in the

receiving waters.

For groundwater revision, see comments above.

18 AAC 70.020 (b)I(A)(i) & II(A)(ii) -- COLOR

~~Shall not exceed 75 color units where water supply is or will be treated. Shall not exceed 15 color units where water supply is not treated.~~

~~Shall not interfere with or make the water unfit or unsafe for the use. Shall not exceed 15 color units.~~

Criteria for beneficial uses should depend on use and nothing else. If the water supply is over 15 color units, it should be treated to meet secondary drinking water criteria. Basing a standard on future treatment uses circular reasoning. The discharger should be required to treat his/her own discharge; it is unfair to pass this cost to downstream users. Also, pollution prevention is cheaper than treatment, and dischargers should be given incentive to reduce the color in the discharge.

18 AAC 70.020 (b)I(A)(iii) & (C), & II(A)(i) & (C)--PETROLEUM HYDROCARBONS, OILS, AND GREASE

Water Quality Standard Questionnaire #5: Total Aromatic Hydrocarbon

The data reviewed by DEC from 1974 to 1982 is unlikely to be of any help. Analytical methods used to measure parts per billion were not widely used until the mid 1980's. Furthermore, proven technologies exist to remove hydrocarbons to the non-detectable level; therefore, a water quality standard could reasonably be NON DETECTABLE.

Water Quality Standard Questionnaire #6: Total Hydrocarbon

A total hydrocarbon standard is needed. Without one we would have nothing to bridge the gap between benzene and oil slicks. The process of a slick or sheen break up necessitates the measurement of total hydrocarbons. Without a total hydrocarbon standard, polluters could legally use flocculants such as fly ash to sink semi and non volatile hydrocarbons. Contaminated sites could be remediated by washing heavy oils directly into lakes and streams in a dispersed phase invisible to proposed testing methods. Is this what we want, to use the waters of Alaska for dumping fly ash mixed with oily sludges?

18 AAC 70.022. HUMAN HEALTH CRITERIA.

It is unclear when and how these criteria are to apply.

Ecology, including fish and wildlife, should be protected as well as human health. Human health criteria should not be automatically used as effluent limits, unless they would protect the ecology also. Also, human health criteria should not be automatically applied to effluent if that would violate the anti-degradation policy in 18 AAC 70.010. In adopting these criteria, is the state granting automatic license for waters to be degraded to these levels, without any site-specific and project-specific justification? The state should first adopt a policy for how these criteria are to be used. Certainly, in no case should they be exceeded; however, no degradation even to these levels should be allowed without satisfying the criteria for exceptions to the anti-degradation policy on a project and site-specific basis, with opportunity for public comment. It should be clearly stated in this section that these criteria do not supersede the anti-degradation policy in 18 AAC 70.010, which must still be satisfied on a project and site-specific basis.

The ADEC should also have a policy for discharges to fresh water which drains to marine water. Many criteria are lower for marine water than for fresh water, such as for arsenic and dioxin. The ADEC should ensure that discharge permit limits are set low enough that discharges to fresh water which comply with fresh water criteria do not then exceed marine water criteria when the fresh water drains into the marine water.

ROUTES of EXPOSURE

DEC WQ standards fail to consider all routes of exposure. Many if not all water pollutants are transported across other media such as into the air and sediments and these routes of exposure must be part of the risk assessment. For example based on the state's reasoning, a body of water used only for industrial purposes could be so degraded that persons living nearby could have their lives threatened from off-gassing, fugitive emissions, or radioactivity.

One example is chloroform. The proposed standard of 4,700 ug/L does not take into account the fact that chloroform readily evaporates from the water and increases the risk of cancer to workers and residents breathing in nearby areas. "Nearby" could be a mile away depending on atmospheric conditions. Also people swimming or working in the water absorb chloroform through their skin. Yet DEC considered the consumption of fish as the only route of exposure. The department's proposals violate its own policy of giving priority to pollution prevention at the source.

FISH CONSUMPTION

The fish consumption rate used by the ADEC to calculate the criteria was 6.5 grams/day/person, which translates to 0.2 oz./day/person, or 1.6 oz./week/person. This is too low for

Alaska. Residents in coastal and subsistence communities consume much more fish. Alaska Department of Fish and Game data shows Alaska's statewide fish consumption is 6 to 60 times higher than the rate assumed by the ADEC, or 1.4 to 14 oz./day/person (34 to 340 grams/day/person). Residents who rely primarily on subsistence for food can consume 2.0 lbs./day of meat (910 grams/person/day), or more. The ADEC should use the highest observed fish consumption rate to calculate exposure to toxic chemicals.

WEIGHT

It is disturbing that health criteria are based on a weight of 70 kg. Health criteria should not be based on the average caucasian male's weight, but should be protective for those most susceptible to toxicity. Since the calculations are based on lifetime exposure, using a baby or child's weight should not be necessary; however, a weight should be used which is also protective for adults of all races and genders. The weight used should be 90 to 100 pounds, or 40 to 45 kg.

Questionnaire #7 CYANIDE

The proposed test for cyanide called "free cyanide" is INCORRECT.

The correct methods are either EPA method 9010 or American Society for Testing Materials (ASTM) method D 2036 C.

Because cyanide undergoes dynamic equilibrium with naturally occurring minerals and organic substances, a slight change in the pH of the water can liberate substantial and even lethal quantities of H₂S. Therefore the total cyanide concentration must be measured as is clearly supported by EPA and ASTM.

aire #3

LOEC

Water quality Standard Questionnaire #3 INCORRECTLY defines LOEC. Paragraph two states:

"The lowest concentration that results in statistically significant adverse effects is recorded as the LOEL of LOEC."

Adverse effects are designated by LOAEC. A LOEC is ANY effect regardless of whether or not the effect is adverse.

NOEL

DEC's reasoning is intrinsically flawed because toxicological methodology uses the NO Observed Effects Concentration (NOEL). An appropriate safety factor is then applied; such as, 100 or 1,000. The DEC air toxics program is fully aware of these

standards and I suggest the water program learn from the air program before going to public comment.

18 AAC 70.023. CHRONIC TOXICITY OF AN EFFLUENT.

The chronic toxicity of an effluent discharged to state water, measured at the point of discharge or at the boundary of a mixing zone authorized by the department in a permit or certification, shall not exceed 1.0 chronic toxicity units (TU_c). Unless the discharge is found to be non-toxic, ~~the~~ department ~~shall will, in its discretion,~~ require in its permits and certifications that chronic toxicity testing of the whole effluent be conducted by the permittee to determine compliance with this criterion. Testing will be conducted to determine the "No Observed Effects Concentration" endpoint, according to methods and procedures specified by the department. Testing must utilize the most sensitive and biologically important life stages of resident species to the extent feasible.

Effluent toxicity testing is probably the only practical way to determine whole-effluent toxicity, for both individual chemicals in the effluent and their combined effects. The department should require toxicity testing unless it is clearly established that the discharge is not toxic.

Because the receiving water can react with the effluent, receiving water should be used as the control and the dilution water for toxicity tests.

In extrapolating toxicity limits from the data, several considerations should be made:

(1) *The data must be reliable. Observed effects and reproduction rates in the control water should be within acceptable limits, or the test should be considered invalid and repeated.*

(2) *Since it is impossible to know with certainty which species and life stages are most sensitive, a safety factor should be introduced to compensate for this uncertainty. The ADEC's "Regulatory Issue Paper: Limiting Chronic Toxicity of Whole Effluent" states: "there is evidence that 1.0 TUC provides protection for aquatic life in 90 to 95 percent of cases." Protecting 90% to 95% of aquatic life is insufficient; 100% should be protected. Of the unprotected 5% to 10%, entire species which are critical to the food chain could be eliminated. The state should not allow its water to be polluted to toxic levels.*

(3) *If only one or two species are tested, the toxicity limit should be a factor of 10 to 100 less than the no observed effect concentration (TUC=0.1). NPDES Permittees should be*

required to rotate the species used in chronic toxicity testing between at least three different species, including a fish, plant, and invertebrate. The test should use the most sensitive species at its most sensitive life stage. The most sensitive species cannot be determined without testing multiple species.

When a mixing zone is allowed, in addition to limiting chronic toxicity at the edge of the mixing zone, acute toxicity should be prohibited within the mixing zone. This is necessary to protect aquatic life outside the mixing zone. If the chronic toxicity unit exceeds one ($TUC > 1.0$), additional testing should be required to establish acute toxicity limits, and a toxicity reduction evaluation (TRE) should be required to assist the discharger in pinpointing and reducing the source of the toxicity.

For your information, a memo is enclosed which discusses toxicity testing requirements. The appropriate test species will vary depending on the receiving water, but note the requirement for testing of multiple species, and the criteria for determining whether test results are valid.

18 AAC 70.032. MIXING ZONES

(a) (1)-(a) (3) (do not revise)

18 AAC 70.032 (a) (1). The proposed revisions to 18 AAC 70.032 (a) (1) do not provide adequate protection against pollutants which concentrate or persist in the environment. Mixing zones should only be allowed for contaminants which dissipate (e.g. chlorine) or regenerate (e.g. dissolved oxygen), and not for contaminants which could accumulate in the receiving water or ecological system (sediments, plants, and organisms) to toxic levels (e.g. heavy metals, salts). For example, mixing zones should never be allowed for pollutants such as dioxin and arsenic, since dioxin can bioaccumulate and arsenic can accumulate in sediments.

The proposed revision would require that it must be first "proven" whether the pollutant causes an adverse effect. This unfairly puts the burden of proof on the state to research and document adverse effects of pollutants, and leaves the state vulnerable to pollutants which have not yet been tested. This fails to protect the public against untested or inadequately researched pollutants, such as DDT once was. This fails to prevent pollution, but only reacts to pollution after it has already happened.

State waters should not only be protected for humans against carcinogens, mutagens, and teratogens, but for all existing and beneficial uses, such as aquatic life and vegetation.

"Risk" should not be changed to "significant risk" because

"significant" is a vague and undefined term.

18 AAC 70.032. (a)(3). It is meaningless to specify that "wastes or substances that may exceed the water quality criteria will be treated, using methods found by the department to be most effective and feasible. . ." This statement is meaningless since it does not specify to what levels the waste must be treated. The levels to which waste are treated are defined elsewhere already (i.e. no toxicity, etc.). Requiring that initial dispersion and dilution be maximized is good, but does not fit in this section since it should apply to all mixing zones.

(b) The water quality standards set out in this chapter may be exceeded within a mixing zone prescribed by the department. However, at no point within the mixing zone may the discharge exceed water quality standards for acute toxicity, for existing and potential beneficial uses of the receiving water. In determining whether a mixing zone is appropriate and the size of a mixing zone, the department will consider

(1) (do not revise)

(2) the effects the discharge may have on the existing and potential uses of the receiving water;

(3) (do not revise)

(4) (do not revise)

According to existing criteria, mixing zones are inappropriate for receiving waters where mixing is insignificant, such as in groundwater which is primarily displaced rather than mixed, or above the lower low tide line, where effluent is not diluted at all for half the time. The ADEC should not allow mixing zones in groundwater or above the lower low tide line.

To adequately protect beneficial uses, water quality within mixing zones must not exceed acute toxicity for the beneficial uses. To have lethal zones in any water column would impair aquatic life outside the mixing zone, which drifts or passes through the mixing zone. Both existing and potential beneficial uses should be protected. Allowing mixing zones is a privilege which should not impair the future potential livelihood of others who also rely, or may come to rely, on that water body.

(c) In determining whether a mixing zone is appropriate and the size of a mixing zone, the department will ensure that ~~other~~ existing and potential beneficial uses are protected.

(d) A mixing zone must be as small as practicable and must be consistent with the provisions of this chapter. Discharge into a mixing zone must be discharged in a manner that

Even totally lined ponds and ditches can attract wildlife and should have wildlife access blocked when necessary to protect wildlife (e.g. cyanide ponds).

(1) "carcinogenic" means a compound ~~identified as a Group A or Group B carcinogen as listed in the Environmental Protection Agency's 1986 classes of carcinogenicity; Group A includes chemicals that have been shown to cause cancer in humans; Group B includes "probable human carcinogens" and is divided into two subgroups: "B1", for which there is limited evidence of carcinogenicity in humans and sufficient evidence in animals, and "B2", for which there is inadequate evidence or no data for carcinogenicity in humans and sufficient evidence in animals, including carcinogens identified by the Environmental Protection Agency;~~

The EPA often lags behind other state programs, current research findings, and the tremendous number of newly synthesized chemicals marketed each year. The EPA is also subject to political and practical constraints in which chemicals it investigates, how many chemicals it investigates, the extent of its research, and the conclusions it reaches. Alaska should not limit itself to considering EPA-listed carcinogens only, but should consider all the currently available data when determining carcinogenicity.

(2) "chronic toxicity" (revise as proposed)

(3) "chronic toxicity unit" (revise as proposed)

(4) "resident game fish" (revise as proposed)

(5) "whole effluent toxicity" (revise as proposed)

(6) "settleable solids" means solid material of ~~organic or mineral~~ any origin that is transported by and deposited from water, as measured by the ~~volumetric Imhoff cone~~ method specified in the ~~17th~~ current edition of "Standard Methods for the Examination of Water and Wastewater," ~~method 2540 (F)~~;

Use the Standard Methods definition; do not redefine. It is not necessary to specify the 17th edition. By simply referring to the current edition, the definition will automatically be kept updated and current for future revisions of "Standard Methods," which is revised every 5 years.

zone proposals.

18 AAC 70.050. CLASSIFICATION OF STATE WATERS

Revise:

(a) The appropriate use classes shall be determined for each receiving water, based on existing and potential beneficial uses. Unless otherwise ~~Except as specified in~~ (b) of this section, state water is protected for the following use classes:

- (1) fresh waters - Classes (1)(A), (1)(B), and (1)(C)
- (2) groundwaters - Classes (1)(A), (1)(B), (1)(C), and (2)(A)(iii)
- (3) marine waters - Classes (2)(A)-(2)(D)

See comments on groundwater under 18 AAC 70.020 (b)I(A)(i)

18 AAC 70.110

(46) "water" (do not revise)

The proposed revisions are unacceptable because they would relinquish the state's right and responsibility to regulate unlined impoundments and disposal systems, and even natural surface waters which are designated to be parts of wastewater treatment and disposal systems. That is, the state is allowed to reclassify existing bodies of water, and no longer consider them as "water." If they are not "water," they no longer have to be protected and regulated to satisfy the state's water quality standard regulations (18 AAC 70). There are no required criteria for department approval under which waters would no longer be considered "water."

These "exempted" waters and wastewaters have the potential to impair waters of the state. This definition would allow the state to reclassify rivers and lakes, for example, as "parts of wastewater treatment and disposal systems" without any required justification. This would allow unregulated impairment of existing and potential beneficial uses of reclassified exempt "waters" (which the state decided are not "water" after all!). This opens the door wide open to unregulated pollution.

As an example, if a mine proposed to use a river, pond or lake as part of its "disposal system," and the department approved, that water could be used as an unregulated dumping ground for waste, even if contamination were likely to percolate into groundwater, or flow downstream. This abandons the state's responsibility to protect all state waters for current and future residents. This revision is unjustified.

maximizes initial dispersion and dilution, using methods found by the department to be most effective and feasible.

~~(e) Unless it is demonstrated to the satisfaction of the department that the size limitations must be increased~~ the department grants a variance pursuant to 18 AAC 70.032 (f), each mixing zone must comply with the following size limitations:

(1) - (3) (E) (as currently proposed)

(f) A variance to 18 AAC 70.032 (e) (1) or (2) may be granted by the department only if the following criteria are met:

(1) It is not feasible for the proposed discharge to comply with 18 AAC 70.032 (e) (1) or (2).

(2) The proposed discharge will comply with all other applicable requirements, including 18 AAC 70.032 (a)-(d), and in (e)(3)(A)-(E).

No variances should be allowed to 18 AAC 70.032 (e)(3)(A)-(E); these limitations are necessary to protect beneficial uses.

~~(f)~~ (g) A person requesting a mixing zone shall submit to the department all information reasonably necessary for assignment of a mixing zone, including information in (a)(1), (b), (d), and (e) of this section, and other information determined necessary by the department to meet the requirements of this section.

The word "reasonably" is not necessary, and opens a loophole to subjective interpretation and political pressures. Under the existing provisions of the federal Clean Water Act, this requirement already exists for all discharges to surface waters. Since "mixing zones" do not exist in ground water (ground water is primarily displaced, not mixed), it seems unnecessary and confusing to restate the requirement specific to mixing zones.

There should be a requirement that all proposed discharge to water in the state of Alaska must:

first receive approval from the state, and

that those proposing the discharge shall submit information necessary for the state to evaluate the proposed discharge for compliance with water quality regulations.

The burden of proof of demonstrating compliance with 18 AAC 70 is on the person proposing the discharge.

This should apply to all discharges to water, not just mixing

Questionnaire #3

LOEL

Water quality Standard Questionnaire #3 INCORRECTLY defines LOEC. Paragraph two states:

"The lowest concentration that results in statistically significant adverse effects is recorded as the LOEL of LOEC."

Adverse effects are designated by LOAEC. A LOEC is ANY effect regardless of whether or not the effect is adverse.

NOEL

DEC's reasoning is intrinsically flawed because toxicological methodology uses the NO Observed Effects Concentration (NOEL). An appropriate safety factor is then applied; such as, 100 or 1,000. The DEC air toxics program is fully aware of these standards and I suggest the water program learn from the air program before going to public comment.

Water Quality Standard Questionnaire #6: Total Hydrocarbon

A total hydrocarbon standard is needed. Without one we would have nothing to bridge the gap between benzene and oil slicks. The process of a slick or sheen break up necessitates the measurement of total hydrocarbons. Without a total hydrocarbon standard, polluters could legally use flocculants such as fly ash to sink semi and non volatile hydrocarbons. Contaminated sites could be remediated by washing heavy oils directly into lakes and streams in a dispersed phase invisible to proposed testing methods. Is this what we want, to use the waters of Alaska for dumping fly ash mixed with oily sludges?

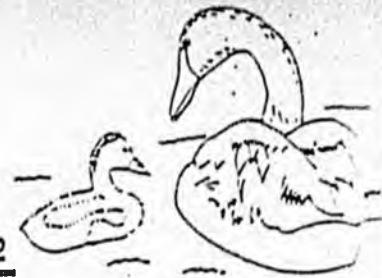
Questionnaire #7 CYANIDE

The proposed test for cyanide called "free cyanide" is INCORRECT.

The correct methods are either EPA method 9010 or American Society for Testing Materials (ASTM) method D 2036 C.

Because cyanide undergoes dynamic equilibrium with naturally occurring minerals and organic substances, a slight change in the pH of the water can liberate substantial and even lethal quantities of H_2S . Therefore the total cyanide concentration must be measured as is clearly supported by EPA and ASTM.

Human Health Criterion - Cyanide



#7 WATER QUALITY STANDARD QUESTIONNAIRE/MARCH 1992

Respondent's Name _____

Agency or Company _____

1. Retain the current application of the aquatic life criterion of 5.2 ug/l (4-day average, measured as free cyanide) to the groundwaters of the state.

Yes No

2. Apply the human health criterion of 200 ug/l for free cyanide to groundwaters.

Yes No

a) If your answer to #2 is yes, then apply the aquatic life criterion of 5.2 ug/l at the point of discharge of groundwaters to surface waters (measured just prior to mixing with the surface waters).

Yes No

b) If your answer to #2 is yes then do you believe this procedure of applying human health criteria to protect human health for groundwater is applicable to other compounds other than cyanide, even where the human health criterion may be lower than the aquatic life criterion?

Yes No

3. Delete the provision that groundwaters are protected for the marine industrial use.

Yes No

a) If your answer to the above question is no, please explain in what circumstance that groundwaters should be protected for the industrial use in marine water. Note that groundwaters are also protected for the freshwater industrial use.

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you have further questions feel free to call Katy Wilkinson at 465-5302.

California
REGIONAL WATER QUALITY CONTROL BOARD
Lakeview Region, South Lake Tahoe office
INTERNAL MEMO

TO: JOHN SHORT AND KEVIN KRATZKE

FROM: MARGARET DRUMM

DATE: JULY 3, 1989

SIGNATURE: *Margaret Drumm*

SUBJECT: CURRENT POLICY ON TOXICITY TESTING REQUIREMENTS

Currently, our region requires toxicity testing for all discharges to surface waters (NPDES dischargers). We also are requiring HL Power Plant to do toxicity testing for their proposed industrial wastewater injection. In the future, we may wish to require toxicity testing for other dischargers such as lumbermills which have ponds located next to a river or below the groundwater table. We may also wish to require favorable toxicity testing results before allowing dischargers to use chemicals for which toxicity information is not already known (this is often the case with proposed boiler and cooling water treatment chemicals, and drilling mud additives).

BIOASSAY MONITORING CF. OTHER TOXICITY LIMITS

All our waste discharge requirements contain narrative discharge specifications for toxicity:

"The discharge of surface flows generated within or as a result of the project to surface waters shall not contain substances in concentrations that are toxic to, or that produce detrimental physiological responses in plants, animals or aquatic life."

Some of our requirements also quantify toxicity limits for water quality parameters such as dissolved oxygen, ammonia, chlorine residuals, and arsenic. However, for our NPDES permits, we also require toxicity monitoring using bioassays. The advantage of bioassay toxicity monitoring is that:

- (1) it gives us a handle on toxicity for constituents for which we have no standards, and
- (2) it reveals symbiotic toxic effects which might not be anticipated.

There are also procedures for determining carcinogenicity and mutagenicity, but these procedures are much more extensive and expensive, and we have never required a discharger to do them.

geothermal water and it is probably infeasible to treat the geothermal water. They are still required to meet the "zero toxicity" limit, but this requirement will probably be met by reinjection. HL Power Plant is in the process of doing a TRE so that they can meet the "zero toxicity" requirement, but they are doing this on their own initiative rather than explicitly by our requirement; they are not yet discharging (by injection) and won't be authorized to unless they get satisfactory results. Susanville CSD has found toxicity in their effluent and is a likely candidate for a TRE. They are currently in noncompliance with the toxicity requirement. Depending on the nature of the toxicity source in their effluent, it may be appropriate to allow the CSD to take into account a mixing zone in meeting their toxicity requirement (i.e. allow for dilution in the Susan River).

EPA REFERENCE DOCUMENTS FOR TOXICITY MONITORING

In Kevin Kratzke's office:

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/600/4-85/014)

Permit Writer's Guide to Water Quality-Based Permitting for Toxic Pollutants (EPA 440/4-87-005)

Technical Support Document for Water Quality-Based Toxics Control (EPA 440/4-85-032)

Program Survey--Biological Toxicity Testing in the NPDES Permits Program (EPA, 1987)

In Eric Taxer's office:

In Binder Labeled "Toxicity Reduction Evaluation Additional Information":

Methods for Toxicity Identification Evaluations: Phase I. Toxicity Characterization Procedures (EPA 600/3-88/034)

Methods for Toxicity Identification Evaluations: Phase II. Toxicity Identification Procedures (EPA 11/88 draft)

Methods for Toxicity Identification Evaluations: Phase III. Toxicity Confirmation Procedures (EPA 11/88 draft)

Abstracts of Toxicity Reduction Evaluations (draft)

Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants (1988)

Project Summary: Toxicity Reduction Evaluation at the
Patawasco Wastewater Treatment Plant

Toxicity Workshop for State and Federal Regulatory Programs
(1989)

LABS WHICH DO BIOASSAYS

Peter Husbee, EPA lab in San Francisco (415)974-8593; EPA does not
accept private contracts, but is a good source of information.

Lyle Lough, Sierra Cascade Lab, Susanville (916)257-7450

Stephen Risch, Ph.D., EA Engineering Science, and Technology, Inc.,
Lafayette, (415)283-7077

Anatech, Santa Rosa (707)526-7200

Marine Bioassay Labs, Watsonville (Bay Area)

Barry Snyder, WESTEC Services, Inc., San Diego (619)458-9044

Aqua Terra Technology (ATT), see HL Power file

Attachment

MD/jf

Standard wording

Toxicity

The discharger shall perform toxicity testing, as described below, on the undiluted effluent and on the receiving water in Honey Lake. The following tests shall be performed annually for a period of four years to allow a statistical analysis of results. The first round of tests shall be performed by December, 1987. The effluent sample shall use test flow from the NorCal 1 well. The following three rounds of tests shall be performed annually after startup, using final effluent which includes a proportion of cooling water blowdown representative of the ratio of cooling water blowdown to spent geothermal fluids. The Honey Lake samples shall be taken offshore of the Dakin Unit of the Honey Lake Area Wildlife Refuge.

1. All tests shall be conducted on grab samples of undiluted effluent. Analysis of Variance (ANOVA) shall be used to determine whether differences between control and effluent data are significant.
 - a. The discharger shall conduct a 7-day Ceriodaphnia survival and reproduction test on samples of undiluted effluent. Toxicity will be demonstrated if there is a statistically significant difference at the 95% confidence level in survival or growth between Ceriodaphnia exposed to an appropriate control water and undiluted effluent. All test solutions shall be renewed daily. If, in any control, more than 20% of the test organisms die, that test (control and effluent) shall be repeated.
 - b. The discharger shall conduct an 8-day fathead minnow embryolarval survival and tetrogenicity test on samples of undiluted effluent. Toxicity will be demonstrated if there is a statistically significant difference at the 95% confidence level in survival or growth between Pimephales promelas exposed to an appropriate control water and undiluted effluent. All test solutions shall be renewed daily. If, in any control, more than 20% of the test organisms die, that test (control and effluent) shall be repeated.
 - c. The discharger shall conduct a 4-day aquatic plant growth test on samples of undiluted final effluent. Toxicity will be demonstrated if there is a statistically significant difference at the 95% confidence level in cell density, biomass, or chlorophyll absorbance between Selenastrum capricornutum exposed to an appropriate control water and undiluted effluent. If, in any control, the initial cell density decreases by more than 20%, that test (control and effluent) shall be repeated.
2. If any one test indicates the effluent is toxic, another confirmatory chronic toxicity test using the specified methodology and same test species shall be conducted within 1 (one) week.

3. All test species, procedures, and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, Section 13; Ceriodaphnia Survival and Reproduction Test Method 1002.0, Section 12; Fathead Minnow (*Pimephales promelas*) Larval Survival and Tetragenicity Test Method 1001.0, Section 14; and, Selenastrum capricornutum Growth Test Method 1003.C, EPA-600/4-85-014. The selection of an appropriate control water for the toxicity tests shall be submitted to Regional Board staff for review and approval prior to use.

II. RECEIVING WATER MONITORING

Receiving water samples shall be collected at two points selected by the discharger and approved by the Regional Board staff. One sampling point shall be located in the shorezone of Honey Lake within the influence of the discharge as shown on Attachment "B". The second sampling point shall be located away from the discharge plume offshore of the Dakin Unit of the Honey Lake Area Wildlife Refuge. Receiving water samples shall be collected monthly for no more than one year before startup of the project and for at least one year after startup until a total of two years of monthly receiving water sampling has been completed. Thereafter, receiving water samples shall be taken every two months, on the same date as effluent samples. Once annually, and at least once before project startup, the receiving water samples shall be split, with half of the sample analyzed for dissolved constituents as usual and the other half analyzed for total (acid-digested) constituents. All samples shall be grab samples. The following shall constitute the receiving water monitoring program:

<u>Parameter</u>	<u>Units</u>
Lake elevation	feet
Temperature	°C/°F
Specific electrical conductivity @ 25°C	micromhos/cm
Total dissolved solids	mg/l
pH	---
Dissolved Sodium	mg/l
Dissolved Chloride	mg/l
Dissolved Fluoride	mg/l
Dissolved Boron	mg/l
Dissolved Sulfate	mg/l
Dissolved Arsenic*	ug/l
Dissolved Molybdenum*	ug/l
Dissolved Selenium**	ug/l

* Samples shall be analyzed utilizing a method with a lower detection level no greater than 10 ug/l.

** Samples shall be analyzed utilizing a method with a lower detection limit no greater than 1 ug/l or less.

TRANS-PACIFIC GEOTHERMAL CORP.
AMEDEE GEOTHERMAL POWER PLANT
Lassen County

-4-

Attachment
BOARD ORDER NO. 6-87-89
NPOES PERMIT NO. CA0102890

19. The issuance of waste discharge requirements for this discharge is exempt from the provisions of the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) and the State Guidelines in accordance with the California Water Code Section 13329. The Lassen County Planning Commission certified a Negative Declaration for the Amedee Geothermal Power Plant pursuant to the provisions of CEQA on July 11, 1987.
20. The Board, in a public meeting, heard and considered all comments pertaining to the project and proposed discharge.

IT IS HEREBY ORDERED the dischargers shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Effluent Limitations

1. The maximum rate of wastewater discharge shall not exceed the design flow rate of 5.6 MGD (3900 gpm).
2. The discharge of surface flows generated within or as a result of the project to surface waters shall not contain any perceptible floating material including, but not limited to, solids, liquids, foams, and scum in concentrations that cause nuisance or adversely affect beneficial uses.
3. The discharge of surface flows generated within or as a result of the project to surface waters shall not contain oils, greases, waxes, or petroleum derivatives in concentrations which cause a visible film or coating on land or on the surface of receiving waters or on objects in the receiving waters that cause nuisance or that otherwise adversely affect beneficial uses.
4. The discharge of surface flows generated within or as a result of the project to surface waters shall not contain substances in concentrations that are toxic to, or that produce detrimental physiological responses in plants, animals or aquatic life.
5. The discharge of surface flows generated within or as a result of the project which are discharged to surface waters shall be of a quality such that the survival of test fish in a 96-hour static bioassay shall, for any one determination, equal or exceed 70 percent of the test fish. The average survival for any three or more consecutive determinations shall equal or exceed 90 percent of the test fish.

This is already standard

This is prohibited



OCT 05 1992

Reply To
Attn of: WD-139

MEMORANDUM

SUBJECT: Comments to Proposed Water Quality Standards
Regulations

FROM: Sally Marquis *Sally*
Water Quality Standards Coordinator

TO: Dave Sturdevant
Water Quality Standards Coordinator

Attached are Region 10's draft comments to the Department of Environmental Conservation's proposed water quality standards regulations. Normally, we would wait to send out comments until the close of the public comment period. But, in anticipation of our discussions over the next month, we felt that our concerns might be more easily resolved if both parties fully understood our position. We are hoping that we can resolve many of these concerns during the remainder of the public comment period. We will provide our final comments to you at the close of the comment period.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

of pages 17

To Jay Nelson	From Sally Marquis
Agency	Phone 206 5532116
Fax 206/561-7812	Fax #

206-553-0165 FAX

DRAFT

DRAFT

Comments to Alaska's Proposed Water Quality Standards

17 AAC 70.010(c) Natural characteristics of water

The state is proposing to administratively approve natural levels as applicable criteria where ambient levels exceed criteria 'naturally'. We can appreciate this need. However, this regulation must be applied only in the few situations where conditions are truly natural, that is not human caused. Ambient waters affected by a discharger should not automatically through operation of this clause, become the default criteria. Please define 'natural' in your regulations so as to clearly exclude human caused pollution. The state of Washington, for example, is currently proposing a definition of natural in its water quality standards (WQS) regulations as follows:

"natural conditions" or "natural background levels" means surface water quality that was present before any human-caused pollution.

18 AAC 70.020(b) Fecal coliform

The state is proposing adoption of a bacterial standard based on a 1976 federal criteria recommending 200 FC/100 ml. EPA has replaced the 1976 criteria with one recommending the use of *E. coli* or enterococci.

We have the following concerns with this proposal.

1) The proposed standard is not consistent with federal criteria. EPA recommended the use of fecal coliform bacteria as indicator organisms until 1986, when the Agency published revisions recommending use of *E. coli* or enterococci. The revisions were based on studies showing significantly better statistical correlations between the incidence of swimming-related gastroenteritis and either *E. coli* or enterococci at fresh water beaches and enterococci at marine beaches than between gastroenteritis and total or fecal coliform.

The agency's new bacterial criteria superceed previous criteria. Therefore, if the state wishes to adopt the 1976 criteria, it must present a scientifically defensible argument that the proposed criteria are fully protective of recreational uses. We agree with the state that this might better be considered when more time allows, perhaps later during the triennial review.

3) Alaska Department of Environmental Conservation (ADEC) is currently proposing a criterion limiting less than 10% of samples to exceed 400 FC/100 ml. Is the illness rate for this level of fecal contamination acceptable given that 200 FC/100 ml results in an estimated 19 illnesses/1000 recreational contacts with the water.

4) The table attached to the Alaska issue paper listing state standards is considerably out of date. I have attached a 1992 summary. For your information, the summary includes the following observations: 38 states rely on the 1968 200 FC/100 ml standard; six states and one trust territory have adopted *E. coli* standard for freshwater; eight states, one tribe and two trust territories have adopted enterococci standards for fresh and/or saline waters; and eleven states/territories have fecal and/or total coliform standards more stringent than 200 FC, including Idaho (50), California (20 for selected waters), Oregon (14 for marine waters), and Washington (50 for Class AA and lake waters, 100 for Class A waters, and 14 for marine waters).

18 AAC 70.020(b) Petroleum Hydrocarbons, Oils, and Grease

The state proposes to eliminate the total hydrocarbon (TH) numeric standard of 15 ug/l. The existing TH standard has been acknowledged by ADEC to be "problematic due to the inappropriate method of measurement and has been little used in practice" (p. 10, TH issue paper). The problems with the standard are essentially two-fold: 1) the scientific basis for the numeric limitation is flawed, and 2) the analytical method for measuring compliance with the standard is inappropriate. We believe that these problems should be the impetus for revising, rather than discarding, the numeric standard. Each problem is addressed, below.

1) The scientific basis for the numeric limitation of 15 ug/l for TH, derived from the total aromatic hydrocarbon (TAH) standard, is flawed. Toxicity testing data for a sensitive Alaskan species was used to develop the TAH standard. An average lethal value of 1.0 ppm was measured and the now outdated safety factor of 100:1 was applied. The TAH standard of 10 ug/l was then calculated.

The TH standard was in turn derived from the TAH standard using a TH:TAH ratio of 1.5:1. However, this ratio was inappropriately low, generating a very conservative TH standard. The 1.5:1 ratio is generally accurate when comparing the concentrations of soluble TH and TAH in a given solution. However, the ratio does not apply when all phases of TH (soluble, dissolved, and particulate) are

compared to TAH. As ADEC noted in the position paper, the ratio of all phases of TH to TAH in Alyeska's effluent is greater than 560 to 1. These numerous and complex technical difficulties render the TH standard inaccurate, but not inoperative altogether.

2) A further complication with the existing TH standard is the stipulated analytical method. The method required for measurement of the TH standard is method 503B (partition infrared). The detection limit of method 503B is 200 ppb which is significantly higher than the TH standard of 10 ppb.

Given the above difficulties with the standard it is appropriate that the numeric standard be revised, but NOT eliminated as has been proposed. The methodology for derivation of the standard should be reviewed and a more scientifically defensible limitation should be included in the Alaska WQS revisions. A first step may be to review the TH standard present in other state standards.

In closing, we suggest you revisit the TH standard to derive an appropriate replacement rather than to eliminate the it altogether. It is important to have a scientifically defensible and enforceable standard. Our office would be pleased to offer assistance in this endeavor.

18 AAC 70.020(b) Sediment

The state is proposing to substitute "settleable solids" for "sediment" and to add, "as measured by the volumetric Imhoff cone method." It suggests in its issue paper that turbidity and settleable solids together provide adequate protection and that the Imhoff method offers advantages of low cost and ability to be measured on-site. We offer the following concerns with this proposal (please see the attachment "Comments on proposed change in Alaska's water quality standard (WQS) for sediment" from Burney Hill to Sally Marquis, for further information):

1) Sediment is generally thought to incorporate settleable solids and total suspended solids (see 18 AAC 70.110(37)). The proposed language essentially removes total suspended solids from consideration in the sediment criteria.

There are circumstances under which a standard for total suspended solids is important to the protection of the biotic integrity of receiving waters. While settleable solids have particularly significant impacts in the suffocation and burial of life on the bottoms of water bodies, and turbidity has impacts on primary production and visual acuity, suspended solids may affect aquatic life.

(especially eggs, larvae, filter feeding invertebrates and fishes) in ways which would not be protected by standards for settleable solids and turbidity. Perhaps 10 percent of the environmental impacts involving the three parameters could be better controlled with the support of a WQS for suspended solids. Thus, a WQS criterion for total suspended solids should be an integral part of a standard for sediments in the water column.

2) Although the state said in its issue paper that "total" methods are time-consuming and expensive relative to the Imhoff cone, it did not expand on this point to give the reviewer sufficient information to weigh whether this advantage is great enough to warrant omitting total suspended solids.

3) Alternative language might be, "No significant increase in concentrations of sediment, including both settleable solids and total suspended solids, above natural conditions", without explicit reference to an analytical method. The term "significant" replaces the proposed term "measurable" in providing, along with state mixing zone policies, professional discretion in the analysis of site-specific conditions and variability. If you use the term significant, we would suggest providing a definition so as to minimize ambiguity in applying the standard.

18 AAC 70.020(b) No Observed Effects Concentration

We believe that it is appropriate for the state to move away from the .01 times the 96 hour LC50 to the no observable effects concentration (NOEC) approach to limit whole effluent toxicity. Because proposed language uses "based on the NOEC of chronic toxicity as determined through toxicity testing..." freely, it is essential that ADEC spell out in implementation guidance exactly how this will be done. (Note: it must be understood that the NOEC protocols are very species specific and few of the test species are endemic to Alaska.)

Related to this provision, we also strongly encourage the state to adopt a narrative free from criterion for toxics. This general provision provides the state with the authority to regulate any chemical/toxic pollutant which threatens human health or the environment. This provision is necessary as a basis to regulate toxics where the state has not adopted a numeric criterion and there is not an adequate basis to calculate a NOEC. In addition, the free from criterion can be used to protect human health where there is no state-adopted numeric criterion. (The NOEC approach proposed by the state does not apply to human health protection.)

18 AAC 70.022 Human Health Criteria

Application of criteria

The proposed language states that the "following water quality criteria for the protection of human health apply to waters where the department determines that there is a reasonable expectation of human exposure through ingestion of contaminated water and aquatic life." The regulations then list criteria for arsenic, dioxin and chloroform. We have two concerns with this language:

- 1) One could misinterpret this language to assume that these are the only human health criteria adopted by the state. This is clearly not the case; Alaska has adopted human health criteria for non-carcinogens.
- 2) The proposed regulation states that application of these criteria is at the department's discretion. This is vague. The state should clearly apply the criteria to specific uses in its regulation as it has other criteria. Furthermore, to be consistent with 303(c)(2)(B) and EPA's proposed Toxic Rule, the state should apply the criteria using the same "rules" followed by EPA in writing the requirements for the Toxic Rule. For example, "In the absence of such an approved State determination (a use attainability analysis), EPA has proposed fish consumption criteria for all aquatic life segments." (56 FR 58432).

Groundwater

We suggest clarifying the proposed narrative to identify which human health criteria apply, for example, criteria for the consumption of water plus organisms or for consumption of organisms only.

Arsenic

To achieve compliance with Section 303(c)(2)(B) of the Clean Water Act (CWA), EPA requires states to adopt EPA's human health criteria using a risk level of 10^{-5} , 10^{-6} , or 10^{-7} or to present other scientifically defensible numbers. Alaska has proposed numbers that it considers scientifically defensible: 50 ug/l for water supply and 190 ug/l for other human health protection categories for freshwater, and 36 ug/l not to be exceeded on the average over a four day period for saltwater. We do not believe that the state's position adequately presents a scientifically defensible position. Our concerns are presented, below. Please

refer to the attached memo by David Frank for additional comments.

(A) The state reasons that because arsenic occurs only in a predominantly non-bioavailable organic form in fish, fish consumption should not be considered in criterion development.

1) The available scientific data do not prove that arsenic is completely absent from fish and other seafood such as shellfish. In fact, the issue paper itself refers to a Canadian study which indicates that freshwater fish contain 10% inorganic arsenic.

Also, it is likely some shellfish (e.g., bivalves and some mollusks) are less able to convert inorganic arsenic to the organic form because they lack the liver-like organ needed for detoxification. In support of this are the results of a study done at the University of Washington in which urinary inorganic arsenic was measured in human subjects after eating mussels. The results of this showed that a large percentage of the arsenic found in the urine of these test subjects is in the low molecular weight form and not in the high molecular weight species (e.g., arsenobetanes) expected from seafood.

2) Very little is known about what happens to seafood (organic) arsenic once it enters the human gastrointestinal tract. The stomach is very acidic and contains enzymes specific for degrading proteins. Therefore, it is conceivable that the form of arsenic available for absorption in the gastrointestinal tract is not the organic arsenic species that was originally ingested.

(B) The state cites epidemiological studies in Lane County, Oregon and Fairbanks, Alaska which do not show toxicological effects even at ambient levels that exceed EPA's drinking water standard (Maximum Contaminant Level, or MCL). It concludes that the lack of toxicological effects in Fairbanks is evidence that EPA's human health criteria are too stringent and that a freshwater criterion based on a MCL is adequately protective.

1) The issue paper questions the validity of the Taiwan data because of (1) genetic differences between the Taiwanese and Americans, and (2) the low protein diet of the Taiwanese. These criticisms are not supported by data from other populations, including the Germans and the Mexicans.

EPA's cancer potency factor for ingestion of arsenic is based upon data of increased skin cancer incidence in people exposed to arsenic contaminated drinking water in Taiwan. An increased cancer risk as a result of ingestion of arsenic in drinking water and medicines has also been shown in

Mexico and Germany. EPA used the Taiwanese studies to calculate the cancer potency factor because it was the best of all of the studies. However, when EPA compared the German and Mexican data to the Taiwanese data they concluded that the German data, and especially, the Mexican data were consistent with EPA's potency number calculated using the Taiwan data.

There is no data to suggest that the Germans or the Mexicans are genetically different from people in the U.S. Also, there is no evidence that the German and Mexican populations studied had diets low in protein.

2) The issue paper uses negative results from epidemiological studies done in the U.S. to question the Taiwanese data. This issue was addressed by EPA's Scientific Advisory Board (SAB) in their review of arsenic issues related to the required development of a new Drinking Water Standard by EPA. The SAB concluded that "part of the basis for the absence of association in the U.S. studies is insufficient statistical power, given the magnitude of the exposure of the U.S. cohorts". In other words, the numbers of people and/or the levels of exposures in the U.S. studies were too low to be able to detect an increased cancer risk.

3) Numeric standards for contaminants are different under the Safe Drinking Water Act and the CWA. MCLs are based on feasibility considerations, including the availability of technology to achieve the regulatory level and the cost of such treatment. Standards/criteria developed under the CWA are based strictly on the basis of health effects, and do not consider feasibility considerations. The methods used to derive the human health values under both Acts are generally considered protective of human health.

EPA's proposed "Toxics Rule" (56 FR 58420) has identified the following guideline for applying its human health criteria to public water supplies: "If the State has public water supplies where aquatic life uses have not been designated, ... the "water + organisms only" criteria in Column D(I) ... are promulgated." To be consistent with this guideline, the state needs to revise its proposed drinking water supply criterion of 50 ug/l based on a drinking water MCL, to 0.018 ug/l, a human health criterion assuming consumption of "water + organisms."

The state could argue that applying a MCL to a water supply use is reasonable, given that fish consumption is not associated with the use. However, such an application would be appropriate only in those waterbodies where the state has clearly demonstrated that no potential for fish consumption exists.

Like EPA's human health criteria, MCLs are based on risk assessments and have risk values associated with them. The drinking water MCL for arsenic of 50 ug/l has an associated cancer risk of 10^{-3} . A new study published this summer in the journal *Environmental Health Perspective* (volume 97, pg. 259-267), "Cancer Risks from Arsenic in Drinking Water", authored by experts including researchers from biomedical, environmental and epidemiological university departments, concluded that at 50 ug/l, "the lifetime risk of dying from cancer of the liver, lung, kidney, or bladder from drinking 1 L/day of water could be as high as 13 per 1,000 persons", or 10^{-2} .

In 1962, the Public Health Service published drinking water standards. The documentation on arsenic in this publication states, "The U.S. Public Health Service Drinking Water Standards for 1946 established an arsenic limit of 0.05 mg/l. In light of our present knowledge concerning the potential health hazard from the ingestion of inorganic arsenic, the concentration of arsenic in drinking water should not exceed 0.01 mg/l and concentrations in excess of 0.05 mg/l are grounds for rejection of the supply."

EPA is publishing proposed new drinking water regulations for arsenic next summer. Information from studies on internal cancers will be used to reexamine the arsenic MCL. Although the regulatory language will not, of course, be known until the rule is final, we expect the arsenic MCL to be much lower than 50 ug/l. We also expect the rule to assign arsenic a maximum contaminant level goal close to or equal to zero. (This level reflects the level of contamination where "no known or anticipated adverse effects on the health of persons occurs and which allows an adequate margin of safety.") In light of the anticipated changes, it may be appropriate for the state to wait for rule completion before endorsing a MCL value.

(C) The state suggests that trivalent, inorganic arsenic rather than total arsenic should be regulated. It also states that this form of inorganic arsenic is not being discharged to the Alaskan environment as it is in other areas of the U.S.

1) Arsenic has an extremely complicated chemistry. The state's emphasis on trivalent arsenic as the only inorganic form of concern is a serious oversimplification of arsenic solubility, toxicity, and oxidation-reduction reactions.

Although acute toxicity studies indicate that trivalent forms of arsenic are more toxic than the pentavalent form, this may not be the case with longer term chronic studies. In fact, exposures to the both the trivalent and pentavalent

forms occurred in the people involved in several of the studies of carcinogenicity. In addition, inorganic arsenic (+5) can be interconverted in the blood of humans with the (+3) species, which is then methylated.

Both pentavalent and trivalent forms are soluble and toxic. Conversion of one form of arsenic to another by reduction or oxidation may occur in the environment. Although studies of inorganic forms of arsenic indicate that pentavalent arsenic is less soluble and less toxic than trivalent arsenic, one should neither conclude nor imply, that pentavalent arsenic is therefore insoluble and non-toxic.

Emphasis on trivalent arsenic alone in waste discharge regulation would neglect the potential for redox reactions when wastewater or a receiving stream enters reducing environments. Consequently, total arsenic would be the important parameter to regulate for adequate protectiveness.

2) The state's argument that trivalent arsenic is not being discharged to the Alaskan environment has a weak basis. We agree that there are no smelters operating in Alaska. However, many other mining facilities exist or are proposed for extracting, grinding, and treating ore in order to mobilize and concentrate metals. Ore processing certainly can modify arsenic speciation.

(D) The state argues that because the proposed saltwater criterion of 36 ug/l is lower than the drinking water MCL of 50 ug/l, and that fish are not a significant source of inorganic trivalent arsenic, the aquatic life trivalent criterion of 36 ug/l should be adopted as the human health saltwater criterion.

1) See above for our position that fish may be a significant source of inorganic arsenic.

2) See above for our position that the complexity of arsenic speciation argues for a human health criterion based on total arsenic.

3) The state proposes to protect human health based on a number designed to protect aquatic life. What is the rationale for this approach?

(E) The state proposes for adoption 190 ug/l for human health protection in freshwater use classes other than water supply.

1) Although no supporting argument is presented, we assume that this criterion is based on EPA's aquatic life freshwater chronic criterion for trivalent arsenic. If so, see above for our arguments that a total arsenic criterion is more reasonable, that fish consumption should be

10-05-92 14:02 FAX 206 555 0100 WATER 02/03/97

considered and that protecting human health based on aquatic life protection is questionable.

(F) In conclusion, because of scientific uncertainties regarding the toxicology of arsenic, its chemical complexities, anticipated new rulemaking, and the relatively high intake of fish and other seafood in Alaskan diets, we recommend adoption of EPA's human health criteria.

Dioxin

EPA's proposed "Toxics Rule" (56 FR 58420) has identified the following guideline for applying its human health criteria to public water supplies: "If the State has public water supplies where aquatic life uses have not been designated, ... the "water + organisms only" criteria in Column D(I) ... are promulgated." To be consistent with this guideline, the state needs to revise its proposed drinking water supply criterion of 30 parts per quadrillion (ppq) based on a drinking water MCL, to a human health criterion assuming consumption of "water + organisms."

The state could argue that applying a MCL to a water supply use is reasonable, given that fish consumption is not associated with this use and that the avenue of exposure for dioxin via water is minimal. However, such an application would be appropriate only in those waterbodies where the state has clearly demonstrated that no potential for fish consumption exists.

The state has not designated human health dioxin criteria for the remaining fresh water uses. The state must designate criteria for these uses to be in compliance with Section 303(c)(2)(B). We believe that these should be designated assuming consumption of "organisms only."

The proposed human health criterion for marine waters is 1.2 ppq. As you are aware, EPA has approved state dioxin criteria ranging from 0.00051 ppq to 1.2 ppq. Criteria of 1.2 ppq have been approved for the states of Virginia, Maryland, Georgia, South Carolina, and Alabama. Several other states have adopted a criteria of 1.0 ppq (Mississippi, New Hampshire, New York, Tennessee.) However, we have two concerns relating to the proposed criterion, as follows:

- 1) The proposed state standard is based upon a fish consumption rate of 6.5 grams per day. While the majority of states with EPA-approved human health criteria have based them on this consumption rate, the Alaska Department of Fish and Game has collected information specific to Southeast Alaska which indicates that residents eat significantly more seafood than this amount. In addition, certain groups of individuals, such as Native Americans, appear to eat much

larger amounts of fish. A recent survey of fish consumption by Native Americans in the Columbia River basin found that adult members of one tribal group (the Nez Perce Tribe) eat an average of 80 grams of fish per day (see attached memo from Harold Sheppard of the Columbia River Intertribal Fish Commission dated April 5, 1992). The survey also indicated that Nez Perce children consume an average of 20 grams of fish per day. The 90th percentile consumption rate for Nez Perce Tribal members is 435 grams per day.

The following states used fish consumption rates greater than 6.5 grams per day in deriving dioxin criteria:

<u>State</u>	<u>Consumption Rate (grams per day)</u>
Arizona	7.5
Delaware	37
Hawaii	19.9
Illinois	20
Louisiana	20
Minnesota	30
Texas	10/15 (freshwater/saltwater)
Wisconsin	20

These rates were primarily derived based upon consumption of fish by recreational fishermen.

2) The State of Alaska, like EPA, has no dioxin criterion for the protection of aquatic life in marine waters. Thus, if the state adopts a criterion of 1.2 ppq for the protection of human health, that will be the only criterion used in the development of dioxin limitations required to meet WQS. (This is likewise true for all the states having adopted dioxin criteria of 1.2 ppq.)

Attached are several documents concerning the effects of dioxin on fish and wildlife. We encourage the state to consider this information in the context of protection of the use described in 18 ACC 70.020(2)(C) for marine waters ("Growth and propagation of fish, shellfish, other aquatic life, and wildlife").

- Declaration of Dr. Steven P. Bradbury, U.S. EPA, dated February 12, 1992. This document was an enclosure to a letter to the U.S. Fish and Wildlife Service (FWS) in which EPA determined that a dioxin concentration of .013 ppq in the Columbia River would not adversely affect bald eagles. This information was sent to the FWS as part of a formal consultation under section 7 of the Endangered Species Act concerning the establishment

considered and that protecting human health based on aquatic life protection is questionable.

(F) In conclusion, because of scientific uncertainties regarding the toxicology of arsenic, its chemical complexities, anticipated new rulemaking, and the relatively high intake of fish and other seafood in Alaskan diets, we recommend adoption of EPA's human health criteria.

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The state could argue that applying a MCL to a water supply use is reasonable, given that fish consumption is not associated with this use and that the avenue of exposure for dioxin via water is minimal. However, such an application would be appropriate only in those waterbodies where the state has clearly demonstrated that no potential for fish consumption exists.

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- 1) The proposed state standard is based upon a fish consumption rate of 6.5 grams per day. While the majority of states with EPA-approved human health criteria have based them on this consumption rate, the Alaska Department of Fish and Game has collected information specific to Southeast Alaska which indicates that residents eat significantly more seafood than this amount. In addition, certain groups of individuals, such as Native Americans, appear to eat much

larger amounts of fish. A recent survey of fish consumption by Native Americans in the Columbia River basin found that adult members of one tribal group (the Nez Perce Tribe) eat an average of 80 grams of fish per day (see attached memo from Harold Sheppard of the Columbia River Intertribal Fish Commission dated April 5, 1992). The survey also indicated that Nez Perce children consume an average of 20 grams of fish per day. The 90th percentile consumption rate for Nez Perce Tribal members is 435 grams per day.

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2) The State of Alaska, like EPA, has no dioxin criterion for the protection of aquatic life in marine waters. Thus, if the state adopts a criterion of 1.2 ppq for the protection of human health, that will be the only criterion used in the development of dioxin limitations required to meet WQS. (This is likewise true for all the states having adopted dioxin criteria of 1.2 ppq.)

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(using a 10^{-5} risk level). For drinking water supply, the state is proposing to adopt EPA's MCL of 100 ug/l for total trihalomethanes which include chloroform, and applying it to chloroform.

It is appropriate to apply EPA's numbers as proposed for all uses except drinking water supply. We have the following concerns with the proposed drinking water criterion:

1) EPA's proposed "Toxics Rule" (56 FR 58420) has identified the following guideline for applying its human health criteria to public water supplies: "If the State has public water supplies where aquatic life uses have not been designated, ... the "water + organisms only" criteria in Column D(I) ... are promulgated." To be consistent with this guideline, the state needs to revise its proposed level of 100 ug/l to 5.7 or 57 ug/l at 10^{-6} and 10^{-5} risk levels, respectively.

The state may argue that using a MCL for drinking water supply is reasonable, given that fish consumption is not associated with the use. However, application of this criterion to specific waters would be reasonable only where the state has clearly demonstrated that there is no potential for fish consumption.

2) Numeric standards for contaminants are different under the Safe Drinking Water Act and the CWA. The methods used to derive the human health values under both Acts are generally considered protective of human health. (Like EPA's human health criteria, MCLs are based on risk assessments and have risk values associated with them. At 60 ug/l of chloroform, for example, the MCL risk level is 10^{-5} .) But MCLs also incorporate feasibility considerations, including the availability of technology to achieve the regulatory level and the cost of such treatment.

2) The drinking water standard of 100 ug/l for Total Trihalomethanes (TTHMs) is currently undergoing negotiated rulemaking (beginning September 28, 1992). The revision may include specific levels for each of the four trihalomethanes as well as a total level for the sum of the trihalomethanes found. Specific levels for each THM and the total are not yet known.

At the present time only public water systems serving greater than 10,000 persons are subject to this regulation. The new regulation will probably be applicable to all public water systems. The proposed regulation is currently scheduled to be published in the federal register in June 1993. The final rule is scheduled for promulgation in June

1995 and the effective date of the regulation would be 18 months after promulgation, or January 1997.

18 AAC 70.023. Chronic Toxicity of an Effluent

We support the proposed change. However, effluent toxicity is not typically "measured" at the boundary of a mixing zone, and a measurement in the receiving water cannot reliably determine compliance. Therefore, we suggest replacing "measured" in the first sentence of this section as follows:

"The chronic toxicity of an effluent discharged to state water, either at the point of discharge or at the boundary of a mixing zone authorized by the department in a permit or certification, shall not exceed 1.0 chronic toxic unit (TUC)."

18 AAC 70.032 Mixing Zones

As outlined below, proposed mixing zone language does not alleviate EPA concerns about the lack of clear guidelines for mixing zones in Alaska. Without such guidelines, EPA and the state could experience major delays and possible conflicts in the permit issuance process.

Most NPDES permits have a need for mixing zone determinations, and the size of the mixing zone is often a source of controversy. EPA often proposes mixing zones to the state in draft permits, based on its interpretation of the standards. The state then must either certify the proposed mixing zones or make a different determination. Unfortunately, the lack of a straightforward guideline causes major delays in permit issuance; new source permittees are particularly frustrated with the delays.

EPA does have the authority to issue permits without final state 401 certification if certain time constraints are exceeded. In some instances of major delays, EPA has made this determination and issued permits without waiting for state certification. The final permit then reflected EPA's interpretation of an appropriate mixing zone.

EPA would like to avoid this breakdown in cooperation and effectiveness, but believes this is possible only if the standards contain mixing zone guidelines that are clear and straightforward.

(a) (1)

The state needs to develop some guidelines for what are "adverse effects" and "significant risk to human health".

Otherwise, the standard will be very difficult, if not impossible, to implement. The state will find itself in the position of engaging in endless debates with permittees over whether or not there will be effects, whether any expected effects are "significant," etc.

(a) (3)

The added language appears to be out of context. We suggest moving the added language to section (b) (4).

We are concerned with the statement "mixing zones applied for and granted after permit issuance...." Granting a mixing zone after permit issuance could create problems with antibacksliding or antidegradation, and added workloads associated with permit modifications.

The language in the section is a bit confusing. The statement that the mixing zone will be based on the "level of treatment defined in the permit" implies that no mixing zones will be granted after permit issuance because, if no mixing zone is specified prior to permit issuance, the level of treatment required in the permit will be sufficient to meet water quality criteria at end-of-pipe. Also, by referencing (e) (3) only, rather than all requirements under (e), an impression may be created that (e) (1) and (e) (2) are not relevant.

(e) (3) (A)

The statement "mixing zones . . . may not exceed aquatic life criteria . . ." is confusing. If, as it appears, the meaning is that water within the mixing zone may not exceed aquatic life criteria, we suggest stating that mixing zones for aquatic life are prohibited in these cases.

Is the statement, "...effluent flow is greater than 25% of the stream flow" based on upstream or downstream flow? For example, if the streamflow is 75 MGD upstream, can the permittee discharge 25 MGD, or does upstream flow have to be 100 MGD to allow a discharge of 25 MGD? The standard also should specify the flow: average, critical low, high, etc.

(e) (3) (D)

This paragraph is confusing. Does this mean, for example, if the copper in a discharge exceeds the aquatic life criterion and the turbidity is more than 5 NTU but less than 25 NTU, the permittee can't get a mixing zone for turbidity?

(Note that Option 2 (e) (3) (iv) in the discussion paper on mixing zones is also unclear. Do you intend to mean that if the natural level of copper in the receiving water exceeds the criteria, permittees are prohibited from getting mixing

zones for any pollutants? The wording under option 1 is at least more clear, in that it specifies end-of-pipe.)

A final comment is to suggest that the state add a provision prohibiting acute toxicity in mixing zones.

18 AAC 70.110(46) "Water"

The language of the definition exempts several types of waters from protection as waters of the state. The exemptions are too broad and may result in significant disagreements between the federal and state levels when dealing with specific waterbodies. For example, under your language, Silver Bay, Gastineau channel or Wards Cove might be identified as treatment systems. Therefore, the present language, leaving the decision as to what does or does not constitute waters that are covered by the CWA to the discretion of the department is not acceptable.

An example of language that would address our concern is, "...impoundments, or other surface water bodies that are either integral parts of wastewater treatment and disposal systems ~~approved by the department, or that are~~ designed, constructed and operated to meet the requirements of the federal CWA."



Alaska Health Project

Information and advocacy on occupational and environmental health.
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(907) 276-2864 In State 800-478-2864 Fax 907-279-3089 Modem 907-279-3128

October 1, 1992

Representative Cliff Davidson
ATTN: Jay Nelson
Legislative Information Office
311 "C" Street
Anchorage, AK 99503

Dear Representative Davidson:

Thank you for inviting the Alaska Health Project to be included in your panel to discuss the proposed revisions to Alaska's water quality standards. We applaud your efforts to increase awareness and public input to the Alaska Department of Environmental Conservation regarding their proposed revisions.

The Alaska Health Project testified and submitted written comments on the proposed revisions. We feel that the proposed revisions do not adequately protect Alaska's waters from pollution. The Alaska Health Project has a history of promoting pollution prevention, because it is more effective and efficient than attempting to control pollution after it has been created. The state legislature has already recognized that pollution prevention and reduction at the source is the most effective way to control pollution, by adopting source reduction as a priority over waste treatment and disposal for solid and hazardous waste (Alaska Statute 46.06.021). The same concepts are true for water pollution, but the proposed revisions fail to reduce pollution at the source.

Our full written comments to the ADEC are enclosed for your consideration. In particular, please note the following concerns:

(1) Enforce the Anti-Degradation Policy

The state has a policy to protect its water against degradation which would adversely affect beneficial uses. This policy should be expanded to protect potential as well as existing beneficial uses. Pollutants of concern are often not naturally occurring in the receiving water, so using the proposed human health criteria as limits would usually allow degradation of water quality. It should be clarified when or whether human health criteria apply in lieu of anti-degradation. Anti-degradation should apply to groundwater as well as surface water. Groundwater should be

protected for all existing and potential beneficial uses, including aquatic life unless it can be verified on a site-specific basis that the groundwater does not recharge surface water.

(2) Protect Human Health

In developing its human health criteria, the state failed to consider that people are exposed to toxins from multiple sources, not only by consuming fish. Also, the amount of fish consumed per person should reflect the maximum fish consumption expected in Alaska, such as by a coastal resident who relies on subsistence. The fish consumption rate assumed by the state in proposing these criteria is 6 to 60 times lower than that determined by the Department of Fish and Game. The weight of a person used in these calculations should reflect the minimum weight of an Alaskan adult, rather than the weight of the average caucasian male. Where aquatic or wildlife criteria are more restrictive than human health criteria, such as for dioxin, the more restrictive criteria should be used to protect all beneficial uses of the receiving water.

(3) The "Water" Loophole

The state's proposed redefinition of "water" opens loopholes big enough for a river or lake to slide through. The state should not be allowed to exempt a natural body of water from regulation by reclassifying it as a treatment or disposal site at its whim. Nor should unlined reservoirs or leach pits be excluded from the definition of "water," since they can and do leach into groundwater.

(4) Misuse of Mixing Zones

The state proposes to clarify its policy on "mixing zones," which are zones in which wastewater is dispersed. The clarifications leave too much "wiggle-room" and should be tightened by removing vague language. Because aquatic life from surrounding areas can pass through mixing zones, pollution levels within mixing zones should be limited to prevent toxicity resulting from short-term exposure (acute toxicity).

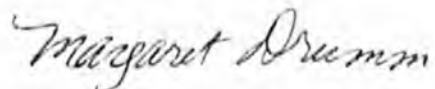
Mixing zones are prohibited in receiving waters with no mixing, and for pollutants which concentrate or bioaccumulate in ecological systems, such as arsenic. Based on the background material provided by the state, it appears that the state is or would be inappropriately allowing mixing zones in opposition to its existing criteria, in water with very little mixing such as groundwater, or for pollutants which concentrate or bioaccumulate in ecological systems, such as arsenic. This is inconsistent with the federal Clean Water Act, at the expense of our health and environment.

(5) Lack of Criteria and Accountability

The proposed revisions allow the Department of Environmental Conservation too much discretion with too little accountability. Terms such as "significant risk," "reasonably necessary," and "virtually free" weaken the regulations because they are vague. Several regulations would be applied "at the department's discretion," but do not specify any criteria to justify the department's determination.

Thank you for this opportunity to provide information to the House Resources Committee. Please consult our enclosed comments for additional information, and feel free to call the Alaska Health Project with any additional questions.

Sincerely,



Margaret Drumm
Environmental Engineer

VALDEZ FISHERIES
DEVELOPMENT ASSOCIATION INC.

P.O. Box 125
Valdez, Alaska 99686
Phone 835-4874 Fax 835-4831



October 9, 1992

Dave Sturdevant
Water Quality Management
Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, AK 99801-1795

Dear Mr. Sturdevant:

As you can see at the bottom of this letterhead, Valdez Fisheries Development Association is committed to the long term health of the phenomenal fisheries resources of Alaska. We are very concerned about the proposed revisions to the water quality standards. If we are to learn anything from insufficient water quality standards and controls throughout our nation and the world it has to be that leniency resulting from industrial pressure and politics in water pollution regulations has very severe consequences in terms of environmental and human health, not to mention major financial ramifications.

Once systems are allowed to be substantially altered where obvious measurable negative effects are taking place, it is often too late to turn back and is always much more expensive by orders of magnitude to restore the threatened system. Such restoration then takes much more severe regulatory action that may be beyond the polluting sources ability to pay for. This scenario goes on in perpetuity elsewhere in this world. It is absolutely imperative that we take steps to increase our protection of Alaska's unique environmental health rather than diminish and undermine it.

To this end we fully support the United Fishermen of Alaska (UFA) comments that were submitted to you by UFA President Jerry McCune on September 30, 1992. We further support the comments submitted by the Alyeska NPDES Technical Advisory Group (TAG) through the September 23, 1992 ADEC memo from Dick Nenahlo to Doug Redburn. In that memo Mr. Nenahlo comments on the TAG comments and in the second paragraph he basically says that there has been "little if any measurable effect on the benthos here" referring to petroleum hydrocarbon discharges in Port Valdez from the Alyeska facility.

*DEDICATED TO THE UTILIZATION, CONSERVATION,
AND REHABILITATION OF ALASKA'S FISHERY RESOURCE
WITHIN THE 200-MILE LIMIT*

Dave Sturdevant
October 9, 1992
Page 2

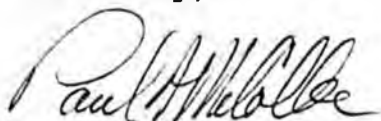
There seems to be a connection between this type of philosophy and the apparent philosophy behind ADEC's proposed revisions to Alaska's water quality standards. This defensive posturing seems to suggest that since all the fish in Port Valdez are not dead and floating on the surface there is no problem.

This whole situation is very disturbing and lends itself to suspicions of excessive political leverage within the ADEC. It does stand for Alaska Department of Environmental Conservation does it not? The citizens of Alaska need ADEC to protect our precious environment not hinder it.

What seems to happen all too frequently in these types of situations is that the large corporations that are the serious polluters have too much power so the regulatory agency gives them whatever they want and then takes their frustration out on everyone else. I'll bet a month doesn't go by that your department doesn't force a private citizen or small business owner to drastically alter their situation with tremendous financial consequences for some rule or regulation. This may be necessary but it seems awfully imbalanced when compared to a huge pulp mill that is poisoning an entire marine ecosystem (not to mention the local human population) with apparently very little concern on the part of ADEC.

Please carefully consider the UFA and TAG comments and act favorably upon them within these proposed revisions.

Sincerely,



Paul A. McCollum
Executive Director

PAM/dar

cc: Jerry McCune, UFA
Riki Ott, PhD
Don Button, PhD
Ihor Lysyj
Sheila Gottehrer, RCAC
Greg Winter, RCAC
Steve Provant, PCRO/PWSDO
Carl L. Rosier, ADF&G
John A. Sandor, DEC
Senator Curt Menard
Rep. Cliff Davidson

①

MEMORANDUM

TO: Marna Schwartz
FROM: Bob Adler
RE: Mixing Zones
DATE: October 6, 1992

Here is a version of the mixing zone proposal introduced in Congress last year -- modified somewhat for a state-specific situation. Mike or Eric should review for Alaska-specific quirks. Hope this is useful.

Mixing Zones

[1] Water quality standards shall be attained in all parts of the waters of the state. Mixing zones or zones of initial dilution within such waters shall be prohibited.

[2] The prohibition established by this provision may be waived if each of the following conditions are met:

[A] the pollutant for which dilution is allowed is listed pursuant to section 304(a)(4) of the federal Clean Water Act; [NOTE: This limits to conventional pollutants]

[B] no acute toxicity will result from the allowed dilution;

[C] any area of allowed dilution shall be as small as possible, and be in a shape that is easy to monitor;

[D] the area of allowed dilution is calculated based on a conservative assumption of low-flow conditions, which will not be exceeded more than one percent of the time; and [NOTE: I think Alaska uses 7Q10 -- if so, it is probably easier just to specify this measure of low-flow conditions.]

[E] the receiving water is not listed as an outstanding national resource water, or is not located in a federal or state park, wildlife refuge, or designated wilderness area [add other Alaska designations if appropriate].

[3] In the case of any mixing zone or zone of dilution allowed in a permit in place as of the date of enactment of this provision, any such permit may remain in effect until after the permit is revised or reissued, by in no case later than five years after the initial issuance of such permit.

cc: Mike Wenig, Eric Jorgensen

Facsimile Transmission Cover Memo

NATURAL RESOURCES DEFENSE COUNCIL

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VOICE Telephone: 202-783-7800
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TO: Marna Schwartz, Eric Jorgenson, Mike Wenig

FROM: Bob Adler

DATE: 06 October 1992 - 13:56 Eastern Time

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PROBLEMS?: Call 202-783-7800, ask for sender on "FROM:" line.

10/28/92

Dave Sturdevant
Water Quality Management
DEC
410 Willoughby Ave., St. 105
Juneau, AK 99801-1795

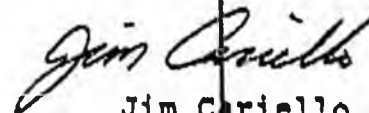
Dear Mr. Sturdevant,

I would like to express my objection to DEC's new water quality regulations. Your department is not considering the impacts upon the fishing, recreation and tourism industries not to mention subsistence users who eat a large proportion of seafood. We cannot take a chance of contaminating our seafood for the benefit of the mining oil and pulp industries. The cost of "cleaning up" environmental blunders such as this will far exceed the economic benefits to the industries. Don't you remember Love Canal? Have you considered the cumulative effects of the pollutants produced by these industries? It's bad enough that we have to breath the pollutants that these industries have released into the air but now we have to worry about our water.

What also bothers me is that DEC is not looking after the health and safety of the public. I don't think it's in the best interest of the people of Alaska for your department to be concerned with the economic benefits of the pulp, mining, and petroleum industries. It's time you put the health of the people first and quit being a lackey for Governor Walter Hickel.

*cc. Cliff Davidson
Rick Albright EPA.*

Sincerely,



Jim Cariello
Box 562
Petersburg, AK

10/28/92

Dave Sturdevant
Water Quality Management
DEC
410 Willoughby Ave., St. 105
Juneau, AK 99801-1795

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C.C. Cliff Davidson
Rick Albright E.P.A.

Sincerely,

Chiska Derr

Chiska Derr
Box 1012
Petersburg, AK



STATE OF ALASKA
LEGISLATIVE AFFAIRS AGENCY
DIVISION OF PUBLIC SERVICES

SEND TO ^{Rep.} CLIFF DAVIDSON
House Resource Comm.
311 C. St.
Anchorage, AK. 99503
DATE: 10/26/92

Please accept the enclosed original(s) of written testimony
for the PROPOSED STATE water Quality Regulation teleconference hearing that was
scheduled on 10/03/92.

A copy of this testimony was transmitted to your committee via
fax on # 561-7617.

10/26/92

Thank you,

Wayne Paulson

26-30

Halb Cliff,

10/9/92

I understand you're the Chair person for the new clean water standards in Alaska, so I guess you're the guy to hear my concerns. First of all I'm dead set against any lowering of the clean water standards in Alaska, our clean water is a very important resource to the state, the fishing, and the marine wildlife in Alaska. To even consider mixing zones and higher Dioxin releases is totally unacceptable. The long term effects would be very harmful to the marine environment and could adversely affect our market reputation for clean fish, plus our future generations wouldn't like inheriting a cesspool!

So I for one would like to see the regulations even tighter, not the other way around.

Thanks

Wayne Parks

Box 985

Petersburg, AK 99732

P.S. Yes, I'm a commercial fisherman.

Also sent original by mail

10/26/92



Alaska State Legislature

Please enter into the record my testimony to the House Resources Committee
committee name
committee on Water Quality Regs, dated October 3, 1992
bill/subject

Please distribute the attached testimony to all
committee members. Thank You.

Signed: Merèdith Marshall

Testifier

Representing (Optional)

P. O. Box 7418 Ketchikan, AK 99901

Address

Phone No.

Meredith Marshall
PO Box 7418
Ketchikan AK 99901

The proposed water quality standards are of critical importance to the citizens of Alaska since they not only affect the environmental quality of the State's waters but also affect how the citizens can use the waters. As such, DEC should ensure that standards reflect the following:

First, while the standards should provide for adequate environmental protection, they should not unreasonably impair the domestic, municipal, commercial, and industrial uses of the waters. Second, the standards should recognize the wide variation in the natural water conditions found throughout the State and not be set at limits so restrictive as to exceed the native water quality. Third, the State should consider the experience of other states in formulating water quality policies and strive to set standards that are generally consistent with those of the other forty-nine states.

Of Alaska's more than 3 million lakes and thousands of miles of coastline, the State of Alaska has not classified marine or freshwater bodies in the State of Alaska for specific uses. While we acknowledge the impossible task of classifying all of them, the State has no plan to classify any more of them at the present time. If the State is reluctant to continue this practice based on time and economic constraints, then why have they worked during this triennial review to continue to regulate water bodies for classifications under specific uses? All but a handful of water bodies in the state are responsible for meeting the most

restrictive standards for each use category regardless of location or use. In most cases, this is unreasonable and puts economic, technological, and growth restraints on the many citizens, municipalities, and industries in the state.

Some specific issues that should be addressed:

COLOR

The proposed water quality standard for color of 15 units is very troublesome. First, it does not reflect the natural levels of color that are found in most Alaskan waters. Many of the streams and coves surrounding Ketchikan have natural levels of color between 30 and 150 units. Under the proposed standard, these streams violate the water quality standard for color despite the fact that there are no man-made discharges into them.

Furthermore, color is mainly an aesthetic issue which generally does not affect the use of marine waters. The very strict standard proposed by the State will not have substantial environmental benefits. Very few states have set numerical color limits and the few that have done so regulate on the basis of increased levels of color at complete mixing.

It is very expensive to remove color from discharge streams. The removal processes frequently generate potential hazardous wastes. Given the very limited benefit and excessive costs associated with

the proposed standard, the State should not adopt a numerical limit. The State should set a standard that considers the natural atmospheric and seasonal variation of color throughout Alaskan waters.

We strongly support the narrative limit as proposed for the seafood processing industry for all marine waters and uses in Alaska.

COLIFORM

The proposed standard of 20 colonies per 100 ml for the most stringent water classification is in some cases 10 times more restrictive than the federal standard. As noted earlier, the most stringent classification is applied unless the waters have been reclassified. No other state regulates this parameter at less than 100 colonies per 100 ml. The level proposed by Alaska is so low that some streams in remote uninhabited areas have coliform numbers that exceed the proposed standard.

We have found no scientific support for such a standard. However, the proposed standard will probably require many dischargers to install and operate disinfection systems to meet a standard required by no state but Alaska.

The position discussed in the state issue papers for dioxins, arsenic, and chloroform are supported.

MIXING ZONES

In setting mixing zones, the State needs to balance the uses of the receiving waters, the size and hydrologic characteristics of the water body, and the measures needed to protect critical resource areas. Since each receiving water has individual characteristics, mixing zones should be set on a case-by-case basis. The State has proposed to get away from arbitrary specifications for determining mixing zones in streams and rivers and should do likewise for marine and estuarine waters. Therefore, the State should suspend its approach of limiting mixing zones in estuarine waters by area and width and adopt the site specific approach proposed for streams and rivers.

This will permit mixing zones to be set in a way that protects the environment yet still allows for the reasonable application of judgment. Otherwise, dischargers may be required to construct expensive facilities merely to satisfy an arbitrary limit with no consideration of whether these facilities will significantly benefit the receiving water.

TOXICITY

The technique of using short-term tests to assess chronic toxicity in waters is a fairly new area of science and needs to be applied cautiously. In setting a standard for toxicity, the State should

specify that the tests used to determine compliance with the standard reflect biological mechanisms that are relevant to the ecology of the receiving waters.

A major concern about short term chronic toxicity tests is that they have not undergone rigorous testing to evaluate inter-laboratory variability and reproducibility. Although these tests can be a useful tool in assessing water quality, extreme caution is needed in using these tests to determine water quality or for setting compliance limits on dischargers. There are still many issues (comparative sensitivities, test exposure regimes, and physiological considerations) that need to be further addressed by research laboratories before these test should be used as a regulatory tool.

PETROLEUM HYDROCARBONS

The proposed standard for hydrocarbons is inconsistent with how other states regulate this parameter and may cause substantial problems for dischargers involved in non-petroleum-related activities. This test will place unnecessary limits on non-petroleum activities.

Most states that regulate total hydrocarbons do so at levels ranging from 10 to 75 parts per million. If the State of Alaska adopts the proposed standard, many entities will be forced to treat

discharges containing minute amounts of hydrocarbons. These entities include municipalities, commercial operations with parking lots, and non-petroleum industries. Since the proposed standard would have an enormous impact on activities that do not cause water quality problems, the State should re-examine how best to regulate this parameter and rely on a standard similar to those adopted by other states.

CONCLUSION

Although water quality is important to Alaska, it is important that the water quality standards not be set so strict as to impose burdens on the citizens of the State that will not significantly benefit ambient water quality. The State has generally classified all its waters for the maximum beneficial uses and therefore should acknowledge that in many cases the natural waters of the State cannot meet the proposed limits. Given the extensive experience of other states with regulating water quality, the State of Alaska should not adopt standards that are much stricter than the norm without detailed and substantial justification.

I do not think these proposed standards will survive a legal challenge so why waste state money defending them. I also believe there is a municipal, industrial concern or small business that can meet ^{them}. Examples being - fish processing plants, sports fishing lodges or businesses any kind located on a shoreline. There can't be selective enforcement targeting only major employers.

I would hope you would balance the threats to our jobs with what would be only marginal benefit to our environment provided by these strict regulations. My attempt to unreasonably burden industry you regulate.