Water Quality Regulations Hearing

10-03-92

file 2

Alaska State Legislature

Please enter into the record my testimony to the House Resources Committee
committee name

committee on water quality standards, dated Oct 3, 1992.
bill/subject

I would first like to comment that this hearing should have been organized differently since all members of the public who wish to have testified were penalized by your lack of time control on the first part of your agenda.
I am against change to the water quality standards. I believe they are a short-sighted attempt to protect some industries at great cost to other renewable industries and the future of Alaska. I feel that costs to ecosystems should be considered more, as well as human health, particularly with regard to dioxin, where costs to non-humans are well-proven. I believe we have inadequate oceanographic knowledge to safely use mixing zones, and they should be forbidden. I will submit further written comments when I have time to prepare them. Thank you.

Signed: Page Else
Testifier

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Representing (Optional)

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Representative Cliff Davidson
Alaska Legislature
House Resources Committee
3111 C. Street Suite 415
Anchorage, Alaska 99503

Dear Rep. Davidson:

On October 3 I attended the House Resources Committee's oversight hearings on DEC's proposed amendments to the water quality regulations, but had to leave before public testimony was taken. Enclosed are comments I submitted to DEC on September 30 which may be of interest. I have a few additional observations to make.

Both Commissioner Sandor and Mr. Sturdevant asserted during the oversight hearing that DEC was not proposing to weaken the water quality standards ("WQS") for aquatic life. This claim must be facetious, since in practice DEC has ignored the WQS for aquatic life by routinely granting generous mixing zones.

The current regulation for mixing zones permits "(t)he water quality standards set out in this chapter ...(to) be exceeded within a mixing zone prescribed by the department." 18 AAC 70.032(a)(1). DEC's current regulatory proposal would add a new subsection (e) to the mixing zone regulation that would further allow the WQS for aquatic life to be exceeded except when some undefined measure of permanent damage occurred. See proposed 18 AAC 70.032(e)(3)(i) and (iii).

DEC has already given generous mixing zones to virtually every major point source of pollution in the state, including Alyeska's Valdez Marine Terminal, the southeastern pulp mills, most fish processors, Cominco's Red Dog Mine facility, publicly owned treatment works --- you name it and odds are that you'll find a mixing zone in which the WQS for aquatic life are, at least potentially, exceeded. Thus, DEC's claim that its current proposals do not reduce the WQS for aquatic life is essentially meaningless since DEC already allows the WQS for aquatic life to be ignored by granting generous mixing zones.

I argue in the enclosed comments that mixing zones are of very questionable legality. I think they originally were granted in order to give industries in place when the Federal Water Pollution Control Act Amendments of 1972 were passed time to install advanced pollution control technology. While they were allowed to use mixing zones, in the meantime point sources were supposed to be making reasonable further progress towards the Act's goal of no pollution discharges by 1985. Unfortunately, in the Reagan era under EPA-administered NPDES permits, mixing zones became the rule, not the exception, and therefore DEC could hardly resist the temptation to allow mixing zones as part of NPDES certifications and state wastewater discharge permits.

I believe it would be very revealing if the House Resources Committee could have DEC inventory the existing mixing zones, giving the date they were created and their size, describing any expansion that has occurred, detailing the bioassay or other testing that has occurred within and without the mixing zones, describing what public comment was solicited, and so on.

On a different subject, arsenic, the House Resources Committee may also want to speak with State Epidemiologist Dr. John Middaugh. I spoke with him recently about DEC's use of a study he coauthored concerning arsenic in Fairbanks area water wells. He thought DEC had completely misinterpreted the results of his study, and was somewhat taken aback that he was not consulted before DEC issued its arsenic issue paper.

I appreciate the time that you have devoted to this subject, and hope you continue to keep an active role in DEC oversight.

Sincerely,

Michael J. Frank

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encl.

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September 28, 1992

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

Re: Water Quality Regulations - Proposed Amendments

Dear Mr. Sturdevant:

Please accept the following comments on the Alaska Department of Environmental Conservation's ("DEC's") proposed amendments to certain of DEC's water quality regulations which proposals were noticed for public review this past summer.

Before addressing specific regulatory changes, I would like to make some general comments on DEC's proposals.

First, some of the suggested changes appear designed to update the regulations to reflect current scientific thinking --- or at least one side of current scientific thinking --- and DEC's motivations in that regard are good. The general tenor of the proposals, however, seems to ignore the fundamental motivation behind the pollution laws enacted over the last twenty years: to pass on a clean world to the next generation. Certain of the proposals (e.g., those dealing with dioxin, arsenic and chloroform, and the 96 hour LC 50) seem bottomed on an evaluation of the comparative risks of pollutants to this generation of water users or on presumed "temporary" effects of a pollutant on aquatic life. But as a doctrine comparative risk is blind to inter-generational values. Its use

as a rationale for allowing certain levels of pollutants to enter otherwise clean water systems virtually assures that the next or following generations of Alaskans will not have as clean an environment as this generation.

Even when comparing and taking risks is necessary in making regulatory judgments, DEC must base it on reasonably complete scientific data. When the data is incomplete or highly disputed (e.g., in the case of dioxin), the choice should be easy: prevention of the introduction of any level of pollution until more is known about the risks. This choice is consistent with DEC's statutory purposes. Instead, DEC's discussion of the purposes behind some of the regulatory changes (in particular those for dioxin, arsenic and chloroform) seems to shift burden of proof: DEC won't regulate any potential pollutant very strictly absent proof of the certainty of the pollutant's harmful effects. This is simply inconsistent with DEC's "responsibility as trustee of the environment for present and future generations." AS 46.03.010(b).

Second, some of DEC's proposals also do not insist on economic efficiency (that each economic transaction should reflect its true cost) or on fairness (that those who cause costs should pay for them). These principles are consistent with mainstream principles of environmental protection *and* free-market economics. As an example, DEC proposes a new human health sta dard for dioxin which purportedly would have the effect of freeing the Ketchikan and Sitka pulp mills of stricter NPDES permit requirements otherwise derivative of EPA's proposed National Toxics Rule. The effect, however, may be to convert the mills' cost of controlling dioxin pollution into a long term social cost borne by the public. The adoption of a more lenient standard for dioxin may also be unfair to competing firms in the same industry which are incurring pollution control costs that reflect either more stringent pollutant discharge standards or a stronger long term commitment to install advanced pollution control technology. In that regard DEC's regulatory issue papers are myopic in their failure to even discuss what the industry is capable of or is doing elsewhere to meet pollution control requirements

Third, in many respects the Public Review Packet makes a sincere effort to lay out the rationale for DEC's proposals in separate issue papers and "fact" sheets. DEC should be applauded for developing separate issue papers, as they ordinarily make it easier for a member of the public to understand an issue and determine DEC's position on it.

Nonetheless, many of the DEC informational documents fall short of good quality and provide an inadequate basis for understanding DEC's rationale in making particular proposals. Among the defects are (1) a redundancy in the information supplied in the fact sheets and issue papers, which makes it appear that there is more information given on a certain topic than is actually there; (2) a failure to have a bibliography in some of the issue papers or accompanying fact sheets (see e.g., the proposed change with respect to mixing zones) so that a member of the public can review informational documents beyond the documents DEC has provided in the Public Review Packet; (3) a failure to cite to scientific information sources *within* an issue paper or a fact sheet even when DEC has otherwise given a bibliography, and instead citing to inappropriate secondary and tertiary sources (see e.g., citations to newspapers and non-scientific magazine articles in the arsenic and dioxin documents); (4) an incomplete citation to sources [see e.g., citation to "(Dickason, 1991)" in the issue paper for the Total Hydrocarbon standard, at page 10, and citation to NCASI, 1990 in the chloroform regulatory issue paper, at page 1, without further identifying information]; and (5) a citation to an industry source as the sole, apparently unchecked, evidence for a proposition (see e.g., citation to the National Council of the Paper Industries for Air and Stream Improvement for the proposition that "the body weight method is more appropriate, etc." in the chloroform issue paper, at page 1).

While DEC is not obligated to create a formal rule making record in support of a regulatory proposal, the Alaska Administrative Procedures Act, AS 44.62, requires that public notice and agency documentation of the proposed changes be sufficient to give a member of the public enough data for the further pursuit of data gathering, informed comment and decision-making. In this regard DEC's supporting documentation often fails the test.

Fourth, and an equally crucial defect that relates to public participation, the Public Review Packet fails to address in any comprehensive fashion considerations highly relevant to certain of the proposals DEC makes. Among these omissions are (1) a failure to include at least a summary of Triennial Review comments received in 1990, although the Triennial Review is DEC's expressed basis for proceeding ahead with the instant proposals; (2) a failure to identify water bodies on which permitted operations exist or are likely to be established (e.g., an existing mining operation with arsenic discharges to the proposed AJ Mine reservoir which may benefit from the proposed re-definition of "water") and which will be impacted in the near term by DEC's proposals, thus making

it impossible for the public to relate a particular regulatory proposal to water bodies that may deserve special protection or for which there is other information relevant to the proposal; (3) a failure to identify existing and major state and federal wastewater discharge permits that will be altered if the proposals become effective, and in that same context (4) a failure to explore in any detail the potential interplay of the proposed amendments, existing wastewater discharge permits and the current and more stringent water quality standards ("WQS") with the anti-backsliding rule of the Water Quality Act of 1987 ("WQA"), Pub. L. 100-4, February 4, 1987, § 404(a), 33 USC § 1342 [amending ¶ 402 of the Federal Water Pollution Control Act of 1972 ("FWPCA"), as amended by the Clean Water Act Amendments of 1977].

With respect to the anti-backsliding rule in particular, the public cannot make an informed decision as to the potential of DEC's proposals to impact existing permittees without knowing whether the rule will or will not prevent changes in the permits if the regulation amendments are adopted. This issue should have been more fully explored in the Public Review Packet.

Fifth, while providing the public a wholly inadequate data set for making the decision, DEC improperly proposes to adopt a 1 in 100,000 "acceptable" risk level for the establishment of WQS for toxic pollutants. This highly significant decision may cross DEC regulatory lines at many interstices. For the choice of an acceptable risk level has effects not simply at the pollution prevention stage but also in how DEC might deal with the existing threats caused by pollution and any cleanups that will be required or are now ongoing. Each of these stages may require different risk choices, and within each stage risk levels might vary depending upon the pollutant, its environs, the local biotic population at risk, etc. If 1 in 100,000 is an acceptable risk level for establishing a human health WQS for arsenic, will it be for BETX air pollutants from Alyeska Pipeline Service Company's Valdez Marine Terminal? Will it become the acceptable risk level determinant for cleaning soil contaminated with fuel from a leaking underground storage tank in a remote area with no groundwater?

Despite the risk-decision's importance, however, DEC seems nearly flippant in its choice, saying: "Establishing a risk level is a social and economic public policy decision. There is no scientific basis for favoring one risk level over another." *Regulatory Issue Paper: Human Health Criteria For Dioxin*, at page 3. Even were this statement completely true, it argues for a highly focused rule making that allows for an

informed public policy discussion of the issue rather than DEC's near inadvertent, ad hoc adoption of a risk level that seems prearranged only to help the operations of certain industries. In fact, in DEC's *Summary of Changes to Alaska's Water Quality Standards Proposed for 1991* (January 1991), at page 6, DEC indicated that a "human health risk level for carcinogens will be identified", intimating that a separate regulation would address it.

Moreover, DEC's statement is misleading. It erroneously asserts that there is no science used in establishing a risk level. Although defining the magnitude and probability of harm often present problems fraught with difficulties and pure value judgments, this is not always so. Scientific knowledge varies in certainty and completeness, and therefore a decision to accept a 1 in 100,000 or 1,000,000 risk level may well be dependent on one's scientific evaluation of data which support an estimation of the risk. It is not simply a matter of deciding whether one is more or less risk adverse as a matter of general policy. The public may be willing to undertake a 1 in 100,000 risk for establishing a dioxin WQS knowing they will never visit Sitka or Ketchikan, but opposed to use of the same risk level in establishing an arsenic WQS because they often drink from placer-mined streams. These personal calculations are not choices devoid of science, and the public is entitled to demand the best evidence and discussion available before they are made. This is so because the risk of error will fall on them, not on the regulated industry.

The risk-decision's importance further suggests that a focused rule making address the context in which risk decision-making occurs and allocate the burden of proof where there is uncertainty. The burden should be on those who wish to pollute to show that there will be no adverse effects, as opposed to allowing the pollution absent proof of harm. This is only as it should be, in recognition of the fact that of 70,000 chemicals used in commerce, fewer than 10,000 have health effects data and but a 100 have some direct human health data. DEC *#3 Water Quality Standard Questionnaire/January 1992*, at page 1 (quoting a Dr. Kim from the New York Department of Health). A focused rule making should address the risks associated not only with cancer, but with effects on future generations in terms of genetic changes, birth defects, etc. It should address the question of comparative risks: whether it is reasonable, for example, to compare the risk of cancer to someone seventy years of age with the risk of genetic defects to an infant.

That DEC's documentation in the *Public Review Packet* is entirely deficient to form the basis for selection of a 1 in 100,000 risk level with respect to arsenic, chloroform and dioxin is most clearly evident in DEC's *Summary Response to Public Comments on Revision of Alaska's Water Quality Standards* (January 1991), § 12, at page 6. Therein DEC said it was considering a 1 in 1,000,000 as the risk level for human carcinogens. It now proposes 1 in 100,000, but does not given a reasoned basis for lowering the target. This illustrates that the entire topic deserves a thorough public airing divorced from any particular WQS or pollutant before a risk "standard" is adopted.

Sixth, underlying DEC's entire approach to the establishment of WQSs and regulation of wastewater discharges may be a fundamental misperception of the obligations imposed on states by the Federal Water Pollution Control Act ("FWPCA"), as amended, and the limitations and obligations imposed by Alaska Statutes. DEC seems to elevate to primacy WQSs in assuming that only from them does one derive operator discharge limits for NPDES and state wastewater discharge permits. See, e.g., DEC's *The Dioxin Issue: EPA, Alaska and the National Controversy*, (May 1992), at page 18 ("these criteria will be used on NPDES permits instead of EPA's limits where appropriate and as applicable to the specified designated uses"). While it is true that both DEC and EPA have relied on WQSs as the bottomline for establishing permit effluent limits, such water quality based permit limitations, to the extent they add to the pollutant load of a water body, are suspect under the FWPCA.

In fact, in enacting the FWPCA Congress expressly intended to focus attention *away* from WQS and *to* so-called "end of the pipe" limitations as the primary method of preventing pollution and maintaining the quality of unpolluted waters. The legislative history of the FWPCA shows that this is true.

The FWPCA of 1948, ch. 758, 62 Stat 1155 (1948) was the earliest comprehensive federal statute dealing with water pollution. It meekly authorized federal research and cumbersome measures to deal with interstate water pollution. 1965 amendments to the Act required states to classify all waters within the state by their intended uses (e.g., swimming, fishing, water supply, etc.). Thereafter, states were required to adopt ambient water quality standards appropriate to the use for which a water body was "zoned", and adopt implementation plans to control discharges sufficiently to achieve the various standards; all of this was subject to federal approval.

Time consuming enforcement procedures in the FWPCA, a perception that the nation's waters were growing more polluted, and dissatisfaction with the WQSs approach to pollution control kept the federal law in the environmental and Congressional limelight. In particular, WQSs proved difficult to establish when there were multiple points of discharge and pollutants, and proved even more difficult to enforce, since one had to trace back the violation of a WQS to the discharge source. Serious consideration of other amendments to the FWPCA began in 1970, and eventually the Nixon Administration and Senator Edmund Muskie became the driving force behind competing proposals.

The Nixon Administration proposals (made in four separate bills as part of a comprehensive package of amendments to the FWPCA) would have continued the water quality standards approach (per a proposed S. 1014), but the states would have also been required to establish effluent limitations for both municipal and industrial points of discharge as part of WQSs submitted for federal approval. In November, 1971 the Senate passed S. 2270, sponsored by Senator Muskie. S. 2270 rejected the Nixon Administration's proposal for continued reliance on WQSs, instead shifting emphasis to a mechanism of permitted effluent limitations designed to control pollutants at the source in order to prevent their discharge *before* they entered any "navigable" waters of the United States. Application of "best practicable technology" and later "best available technology" at the end of the pipe was required in pursuit of this national policy.

The House of Representatives began deliberations over companion legislation to S. 2270 in November 1971. In the House the Nixon Administration again opposed a shift of emphasis from WQSs to effluent limitations. EPA Administrator William Ruckleshaus favored House-introduced legislation which would have required that effluent limitations only be used as a last resort and then only if socially and economically achievable. U.S. House of Representatives, *Committee on Public Works, Water Pollution Control Legislation - 1971, (H.R. 11896, H.R. 11895).*, Hearings, 92nd Cong., 1st Sess., December 7 - 10, 1971, at page 286. A later House-passed bill in essence continued emphasis on WQSs, and forced a Conference Committee to resolve differences with S. 2270.

The resulting bill approved in conference and in 1972 signed into law was, with minor changes, S. 2270. While the new law amending the FWPCA continued the use of WQSs, it abandoned reliance on them, and

instead switched to a set of technology based requirements specifically constructed for quick and simple implementation. Progressively tighter levels of effluent reduction were established so that the nation would make rapid progress to achieve the new national policy: "It is hereby declared to be national policy that the discharge of pollutants into navigable waters be eliminated by 1985." § 101(a)(1) of the 1972 FWPCA amendments. While the "policy' was not intended to be enforceable in and of itself, it was intended to establish the decisive guideline for implementation of the FWPCA. U.S. Senate, Committee on Public Works, *A Legislative History of the Water Pollution Control Act Amendments of 1972*, 93rd Cong., 1st Sess., 1973, Vol. II, at page 1262.

The new FWPCA amendments detailed factors for EPA to consider in setting effluent reduction levels in each case, including cost, technical feasibility and "non water quality environmental impacts". The impact on water quality, however, was expressly excluded, consistent with the desire to focus on end of the pipe discharge controls. *Weyerhauser Co. V. Costle*, 590 F.2d 1011, 1041-42 (D.C. Cir. 1978); *accord, Assoc. of Pacific Fisheries v. EPA*, 615 F.2d 794, 805 (9th Cir. 1980).

The federal policy of continued advancement toward the no discharge goal was reinforced with the Water Quality Act of 1987's adoption of an anti-backsliding rule, and more recently with passage of the Pollution Prevention Act of 1990. The latter Act indicates that it remains national policy that "pollution should be prevented or reduced at the source wherever feasible...." Pub. L. 101-508 (Nov. 5, 1990), 104 Stat. 1388, 42 USC § 13101 note).

Alaska law is written consistently with this national policy. AS 46.03.010(a) indicates: "It is the policy of the state to conserve, improve, and protect its natural resources and environment and control water...pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being." See also id. at (b). Water pollution is flatly prohibited. AS 46.03.710 ("A person may not pollute or *add to* the pollution of the...water of the state." Emphasis added.) See also, AS 46.03.800(a). The "terms and conditions (of wastewater discharge permits) shall be directed to *avoiding* pollution and to otherwise carry out the policies of this chapter." AS 46.03.110(d)(emphasis added). Anti-degradation strictures are established by regulation. 18 AAC 70.101(b)-(c).

Under the FWPCA and state law, therefore, WQSs establish the fallback protection for Alaskan waters. The central focus, however, is on end of

the pipe prevention. In contrast, DEC seems to presume it acceptable to establish WQSs as a first, and the critical, step in determining end of the pipe discharge limits. It further presumes that mixing zones are acceptable as long as designated uses can be protected, when dilution was clearly abandoned as a solution to pollution with the FWPCA's 1972 amendments. None of this is consistent with either national or state goals as expressed in federal and state law. Existing law requires that no risk of error be discharged from the end of the pipe.

I will now turn to the more specific comments I have about individual changes DEC proposes in the regulations.

INDIVIDUAL REGULATION CHANGES.

Arsenic. The issue paper's heavy reliance (see issue paper, at page 6) on "two comprehensive epidemiology studies in Fairbanks" (id. at page 5) to justify its proposed human health criteria for arsenic is entirely misplaced. Neither study were "comprehensive." For example, the study co-authored by current state epidemiologist Dr. John Middaugh focused on natural levels of arsenic in Fairbanks groundwater and determined the rate at which the body would accumulate natural arsenic. The study was not a long term evaluation of the human health impact of ingestion of arsenic, and did not look at the ingestion of arsenic introduced into drinking water from placer mining activities. I urge you to consult with Dr. Middaugh and correct the issue paper's characterization of the results of his study.

Moreover, DEC's dismissal of the Taiwanese study's relevance to Alaskan conditions is unwarranted. DEC assumes that because the Taiwanese exposed to arsenic were of a different race than most Alaskans and have a different diet that most Alaskans the study's showing of adverse health effects in Taiwanese is not translatable to Alaska. In establishing a WQS, DEC cannot assume those exposed to arsenic ingestion from Alaskan waters will always be of a different race, have different genetics or have a different diet than those humans adversely affected in Taiwan. Such assumptions would be an absurd, if not constitutionally suspect and socially reprehensible, basis for establishing any environmental rule.

Given that DEC conceded in its *Summary Response* that it has no ability to comprehensively evaluate the natural or, for that matter, the unnatural characteristics of Alaskan waters, it cannot claim as it did in

the arsenic issue paper that trivalent, inorganic arsenic is not being discharged into Alaskan waters.

Dioxin. Aside from its expressed intent to insulate the southeastern pulp mills from a more stringent National Toxics Rule, what apparently drives DEC's motivation in setting a relatively lenient dioxin WQS is its incorrect assumption that "Current theory indicates that, in fact, there is a safe threshold level for dioxin in the body below which cancer would not occur." DEC's *Regulatory Issue Paper: Human Health Criteria For Dioxin*, at pages 4-5. This assumption is false. It perhaps derives from an inaccurate press release issued by the Chlorine Institute after an Institute sponsored scientific meeting at which dioxin was the topic. *Scientific American* (April, 1991), at page 24. Most current scientific thinking --- and recent scientific findings --- continue to support the generally accepted view (outside of the view shared by trade associations and industry sponsored studies) that there is no threshold for dioxin. *Science*, October 18, 1991, at page 377. Accordingly DEC should revisit the literature on this subject and reconsider its proposal.

Chronic Toxicity of Whole Effluent. DEC should not permit chronic toxicity within a mixing zone. To do otherwise means the designated uses within a mixing zone are not protected. Indeed, DEC agrees. See *Regulatory Issue Paper: Mixing Zones*, at page 3 ("The mixing zone language should assure that the water body has a continuous zone of passage for migratory species that meets water quality criteria.") Therefore, it is inappropriate for this regulatory change to require chronic toxicity to be measured at the *boundary* of the mixing zone. That DEC proposes otherwise strongly suggests that mixing zones are really pollution giveaway zones, a device to circumvent timely implementation of end of the pipe discharge goals.

Also, the language of the definition for a "chronic toxicity unit" seems limited to single generation impacts. What if the second or third generation of an exposed species displays genetic defects? This possibility does not seem to be encompassed within the language of the definition.

Mixing zones. Extensive use of mixing zones --- and any use of mixing zones where end of the pipe technology is readily available to prevent pollution discharges --- is inconsistent with existing law. Moreover, contrary to DEC's statements in the mixing zone issue paper, the proposed mixing zone regulation introduces more vagueness into the

existing regulation; it does not clarify it (although the existing regulation *does* need clarification).

If one looks at other states' regulations on this subject, virtually all set clear, easily enforceable numerical limits on the size of mixing zones. DEC's proposal, nonetheless, leaves the issue up in the air, giving the public and regulated industry no clear guidelines on what to expect. Also, allowing the entire width of a stream to be dedicated to a mixing zone would DEC leave no margin for safety, particularly at low water flow times of the year.

The current proposal also does not clarify that the burden of proof is on the applicant to justify a mixing zone. In fact, mention of "burden of proof" in amending language may suggest that DEC has the burden of proof on any thing not clearly laid at the feet of the permittee/applicant. The regulatory language should be clarified to say that the applicant has the burden of proof on all relevant elements, including those in subsection (a) of 18 AAC 70.032.

The introduction of the phraseology "adverse effects" and "significant" in subsection (a)(1), as DEC proposes, opens broad loopholes in the existing language. Moreover, the proposed limiting language for adverse effects on "human health at the location" ignores impacts on aquatic life, and leaves open the question of responsibility if human health effects are caused outside the boundary of the mixing zone "location" but clearly caused by pollutants in the waters of the mixing zone.

Further, the suggested phraseology "using methods found by the department to be most effective *and feasible*" in proposed subsection (a)(3) is inconsistent with the anti-degradation language and requirements of 18 AAC 70.010(c)(3)("all wastes and other substances to be discharged using the methods found by the department to be most *effective*").

Proposed language for subsection (e)(3)(iii) adds even more ambiguity, suggesting that "mixing zones may not result in permanent displacement of indigenous organisms or long term reduction in fish population levels" without defining "permanent" or "long term."

Adoption of a new category of protection for "resident game fish" is too limiting and inconsistent with the goal to protect all aquatic life. I do not think DEC intends to allow the destruction of fish species which are neither anadromous nor "resident game fish" but which are part of the

food chain on which anadromous fish and resident game fish depend for survival.

Establishment of a mixing zone, or its expansion, should be an event that is subject to public review and comment. The existing regulation is not clear in that regard. DEC should adopt an amendment which makes it clear that mixing zones will not be established or expanded without public notice and a comment period.

Natural characteristics. I do not understand what DEC's motivation is here. In DEC's *Summary Response, supra*, § 5, at page 2, DEC indicated that the existing regulations already provided an adequate basis for "accomodat(ing)" situations where the "natural pollutant levels exceed the criteria of the WQS". Moreover, DEC has already conceded its administrative inability to "comprehensively establish background levels of toxic compounds in waters of the state, except where special studies are done at specific sites." Id., § 11, at 5. Yet it proposes language that would allow it to do precisely that, without public notice or comment.

DEC's proposal suggests that it can ignore effluent standards and limitations on water bodies with high natural levels of pollutants, although this would be inconsistent with the FWPCA. It also would be inconsistent with AS 46.03.710 (may not "add to" the pollution of a water body).

DEC suggests no method for defining "natural." What are the parameters? How would DEC go about "administratively approv(ing)" natural levels? Permit by permit? Pollutant by pollutant? At what level of DEC'S administration would this occur, and with what public involvement?

96 Hour LC 50. The issue paper on this topic concedes it is a "cursory treatment of a complex subject." What is most troubling is that the paper does not more fully discuss the need to bridge between regulatory standards and in-the-field enforcement.

Since DEC indicates that "There is no current intent for the Department to get seriously into the business of toxicity testing" and the DEC Laboratory is not equipped to do so, what types of tests are left to DEC field officers to do that would test for chronic pollution problems from a permittee's facility? To quote from page 2 of the *#8 Water Quality Standard Questionnaire/March 1992 (Topic: Sediment Standard)* "[I]t is

necessary to have methods of measurement that are cost-effective and can be performed by the operator...." This should also be true for DEC, or else the monitoring will be totally within the control of the operator.

Yet DEC proposes to drop the 96 Hour LC 50 default test for chronic toxicity and substitute a very expensive, time consuming bioassay testing regime that it does not have the capacity to perform. The testing burden will fall on the regulated permittee. In effect DEC will allow the regulated permittee to test itself for pollution problems. This abdicates DEC's roles of surveillance and enforcement.

Moreover, the financial burden on smaller operators of chronic toxicity testing will be substantial, perhaps crushing at times, and likely will have the effect of DEC foregoing the requirement of such testing as a permit obligation.

While in an ideal world, with an adequate government laboratory and unlimited government funds for research and testing, DEC's proposal would make scientific sense, it is not a world that DEC lives in. DEC must, therefore, set default limits that are easy and inexpensive to enforce.

Total hydrocarbons. The proposal to drop this standard is troubling insofar as it leaves only the "no sheen" rule in place to prevent non-TAH hydrocarbon pollution. While it may make good science to better categorize hydrocarbon families for standards-setting, the no sheen rule's usefulness in all contexts is dubious. In the turbid waters of Cook Inlet or in the Alyeska mixing zone in Valdez (where there may be turbidity due to the Lowe River), one might see no sheen although a water quality test would show hydrocarbon presence of 100 mg/l, approximately 700 times greater than the current TII standard. It does not seem to make sense to ignore the heavy hydrocarbons and worry about the more volatile TAHs which may present a less acute (albeit, more chronic) threat.

Sediment. Lots of different types of and fines in sediment are not "settleable" and will not settle out in the hour provided for in the Imhoff Cone test method. One can have a very muddy stream and still meet the settleable solids standard. Accordingly, DEC's proposal threatens a huge change which can only degrade state waters. This change, when coupled with elimination of the "color" criteria, will turn aesthetically pleasing, clear water streams into cloudy flows...Ironically, it was DEC itself which indicated in its *Summary Response, supra*, § 14, at page 7, that the

existing sediment and turbidity criteria, for both fresh and marine waters, "*are necessary* to protect designated uses. ADEC believes there is sufficient flexibility in the WQS to accommodate regional or site-specific variations through short-term variances, site-specific standards, mixing zones, and reclassification."

Definition of water. I do not understand what the second "or" clause of the language proposed to be added to the definition adds to the definition. What does it include that the first part of the sentence doesn't? Only last year DEC stated that the existing definition is "essentially the same as the statutory definition." DEC's *Summary Response*, *supra*, §, 49, at 14. DEC now proposes a change to the definition which varies with the statutory definition, without explaining why.

What is troubling about the proposed definition is that it would exempt from the WQSs clean water flowing into a polluted treatment pond, simply because the operator has constructed the treatment system to capture the clean water. Waters in treatment facilities should be exempt, but not if the treatment facilities are interjected into the pathway of the natural flow of a clean water body. Operators should be obligated to divert clean waters around their treatment facilities. To allow otherwise in effect allows the creation of "mixing zones" upstream of the end of the pipe.

CONCLUSION

I hope my comments are helpful and are not seen as overly negative. (It is an unfortunate by-product of the regulation review/comment process that negatives are highlighted.) I sincerely appreciate the time you spent with me on the phone recently in discussing DEC's proposals.

Enclosed are completed questionnaires with respect to certain of the individual proposals.

Sincerely,

Michael J. Frank

encl.

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September 30, 1992

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Juneau, Alaska 99801-1795

Dear Mr. Sturdevant:

This past February, the United Fishermen of Alaska held its annual board meeting in Juneau. During one of the sessions, Governor Hickel met with the UFA board and addressed the water quality issue. Enclosed is a copy of an Anchorage Times article, "Hickel Backs Fishermen on Water-quality Representation," dated February 13, 1992. The article summarizes Governor Hickel's comments regarding revisions to state water quality standards:

> "Hickel told the United Fishermen of Alaska board that he supports the group's request to have a fishing industry representative work closely with the state when it changes water-quality standards and regulations."

We interpreted this comment as a commitment on the part of the governor to work with the fishing industry on revising and updating the state's water quality regulations. Unfortunately, this has not been the case and commercial fishing interests have been disregarded throughout this process.

Cordova District Fishermen United is concerned that the state is moving too rapidly in its efforts to revise Alaska's water quality standards and is making critical decisions based on erroneous and incomplete information. The most glaring example of this is basing the human health criteria for dioxin on a fish consumption rate of five pounds per year. This rate of consumption is clearly inappropriate for setting dioxin standards for Alaska. The ADEC issue paper on dioxin cites data collected by the Subsistence Division of the Alaska Department of Fish and Game which indicates that fish consumption in Alaska generally ranges from 30 to 300 pounds per year. If ADEC had chosen to base the rate of fish consumption at the lower end of this range, it would only be twice the national average of fifteen pounds, as calculated by the National Marine Fisheries Service.

We realize that there is a difference of interpretation regarding ADEC's value for the consumption rate of fish. During the KCHU radio call-in show, "Coffee Break" (9/21/92) you were asked about the five pound fish consumption value. You responded that the value did not refer to a total consumption rate of five pounds of fish per person per year, but rather referred to an annual consumption rate of five pounds of contaminated fish. Indeed, if this is ADEC's position, then the public has been commenting on incorrect information. The dioxin issue paper does not mention that the five pound value represents contaminated fish ingested over the course of a year.

CDFU maintains that the proposed changes to the state's water quality standards are too much, too fast. While the Hickel Administration and ADEC have acknowledged that the new regulations will benefit the Southeast Alaska pulp and mining industries, these changes amount to throwing a regulatory blanket over the entire state in order to cover a few localized permitting problems. Since these new regulations will change the rules governing water quality throughout the state, it's unreasonable that the fishing industry and other interested parties weren't consulted or invited to help in their formulation.

CDFU is not satisfied that the data cited by ADEC illustrate or justify a clear need to change the existing water quality standards. Rather, CDFU urges ADEC to take a more conservative approach to the water quality issue and keep the administration's promise to work closely with the fishing industry in reviewing and revising the water quality standards. To meet this end, we support the establishment of a dispute resolution water quality task force to identify problem areas in the existing regulations and negotiate acceptable solutions. The task force would be composed of people representing all affected parties including various public and private interests and impacted industries. A dispute resolution process will help to avoid the time, energy and expense of legal action through the courts and encourage balance in formulating public resource policy.

CDFU does not support the water quality revisions proposed by ADEC. However, we do endorse the recommendations and technical comments submitted by United Fishermen of Alaska.

The seafood industry is Alaska's largest private sector employer and second-largest income producer. The Consumer Reports article, "Is Our Fish Safe to Eat?" was a wake-up call to the seafood industry that consumers are becoming more concerned about the wholesomeness of what they eat and where it comes from. Unlike many other seafood producers, Alaska has an enviable marketing edge for promoting its fisheries products: pure, uncontaminated water. We can't afford to lose this marketing advantage - clean water helps to sell fish.

CDFU recognizes that the development and utilization of Alaska's natural resources is the key to our state's economic well-being. Alaska needs to make a concerted effort to balance our need to develop our natural resources while maintaining a healthy, productive environment. As far as water quality is concerned, that balance can best be determined by establishing a conflict resolution task force.

Sincerely,
CORDOVA DISTRICT FISHERMEN UNITED

Mary L. McBurney
Executive Director

cc: Governor Walter J. Hickel
Attorney General Charles Cole
John Sandor, Commissioner ADEC
Carl Rosier, Commissioner ADF&G
Glenn Olds, Commissioner DNR
Senator Curt Menard
Representative Gene Kubina
Representative Cliff Davidson

enclosure

2/13/90 Times

Hickel backs fishermen on water-quality representation

By ROGER F. NYHUS
ASSOCIATED PRESS

JUNEAU — Gov. Walter J. Hickel reassured a group of fisherman Wednesday that he sympathizes with many of their concerns, including maintaining strict water-quality regulations.

Hickel told the United Fishermen of Alaska board that he supports the group's request to have a fishing industry representative work closely with the state when it changes water-quality standards and regulations.

"You not only have a right, I think it's a protection of one of the greatest industries Alaska has," Hickel said.

Board member Riki Ott told the governor that the recent Consumer Reports article about salmon contaminated with cancer-causing PCBs highlights the need for clean water.

"High water-quality standards relate directly to high-quality fisheries resources," Ott said. "If industry wants to do a project, you follow the laws that are out there, and you don't get exemptions. You do it right."

Hickel responded: "I don't have any problem with that."

Ott said fishermen are concerned about changes in the state's water-quality regulations, including clean-water standards that relate to forest-practices legislation passed by the Legislature in 1990.

"The streams serve as our economic nursery," said board member Kate Troll, who represents the Southeast Seiners Association. "We feel that is somewhat threatened. We'd like to see our water-quality standards maintained. We don't want regulations that are full of loopholes."

The state Department of Environmental Conservation is reviewing changes to Alaska's water-quality standards as well as the forest-practices legislation, which requires [illegible] near streams.

"We have no intention to weaken our water-quality standards, although there are certain things we need to modify, and the standards may turn out higher or lower," Dave Sturdevant, DEC's water quality standards coordinator, said in an interview.

The state must update its water-quality standards every three years to comply with the federal Clean Water Act, he said. The state began reviewing its standards in 1990. It expects to hold a second round of public hearings on the proposed changes in early fall, Sturdevant said.

The state Department of Natural Resources, DEC and the U.S. Environmental Protection Agency are working on the proposed forest-practices regulations, he said. Fish and Game Commissioner Carl Rosier said the proposal should be completed within 30 days.

"To the extent that any of the departments in the state are even considering things like abandoning, tough water-quality standards — that's a total disaster," said Deming Cowles, United Fishermen's lobbyist in Washington, D.C.

"The state has some of the strongest water-quality standards in the nation. That's one thing that helps us sell our fish."

Hickel said he supports increased funding for domestic seafood marketing, primarily for salmon, and more regulation of [illegible] factory trawlers.

Gov. Walter J. Hickel

UNITED FISHERMEN OF ALASKA

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September 30, 1992

Dave Sturdevant
Water Quality Management
Dept. Environmental Conservation
410 Willoughby Ave., Suite 105
Juneau, AK 99801-1795

United Fishermen of Alaska is very concerned that the revisions proposed by the Department of Environmental Conservation to Alaska's water quality standards will lead to degradation of fish habitat, reductions in fish populations, and erosion of consumer confidence in Alaska's seafood quality. UFA believes that these proposed revisions will have tremendous negative economic impacts, both short- and long-term, which will be felt statewide throughout the entire seafood industry. UFA believes that these potential economic impacts to the seafood industry have not been addressed - AT ALL - by the DEC in its haste to implement its own standards before substantially higher standards are set by EPA through the National Toxics Rule. UFA finds that DEC's approach lacks both balance and foresight.

Seafood is Alaska's No. 1 export. Alaska's seafood production ranks first among states and fifth among nations. The seafood industry is Alaska's largest private sector employer, providing jobs for one in twenty Alaskans (i.e., 70,000 seasonal or 33,000 year-round jobs). The seafood industry is Alaska's second-largest revenue generator ($31.1 million in taxes in 1991).

Besides exporting this abundant resource, Alaskans eat it - lots of it. Alaskans may consume more fish and shellfish than residents from any other state: studies from the Subsistence Division estimate that average consumption of fish and shellfish among some subpopulations of residents exceeds 200 pounds per person per year.

Consumer confidence in Alaska's seafood is driven by the perception that Alaska's fish are pure because Alaska's water is pure. The state invests in and markets this image through the Alaska Seafood Marketing Institute (ASMI). For example, in February this year, the state went to bat for its seafood industry when Consumer Reports published an article titled "Is Our Fish Fit to Eat?" The report advised against eating salmon, among other fish, because of contamination with PCBs and heavy metals. Clean water, protected by strong water quality standards, played a key role in returning consumer confidence in Alaska seafood.

The state spent $13.5 million alone last year to market "pure" Alaska salmon from Alaska's pristine waters. Like many industries dealing with informed and concerned consumers, ASMI recognizes the economic advantage of perception and consumer confidence. As such, ASMI includes this statement in its press packets:

> "According to the National Oceanographic and Atmospheric Administration, Alaska has the world's most pristine waters. Analysis of strategic sample sites conducted by NOAA, such as the 1984-1985 "National Benthic Surveillance Project: West Coast" annual report shows Alaska's fishing grounds to be located in waters free from heavy pollutants."

DEC's proposed revisions would clearly undermine this economic advantage.

Gov. Hickel recognized the critical link between quality fish and clean water when he told the board of UFA this February that maintaining strong water quality standards was "a protection of one of the greatest industries Alaska has" (Anc. Times 2/13/92). Lack of adequate protection of water and habitat has led to deterioration of fisheries resources in virtually every other state in the nation. And many states are investing hundreds of millions of dollars to restore their water quality. Gov. Hickel recognized that Alaska must avoid repeating the mistakes which cost other states their fisheries.

Gov. Hickel supported UFA's request to have a fishing industry representative work closely with the state while it revised the water quality standards. DEC failed to carry through with the governor's promise, and made it difficult for commercial fishing industry to participate. DEC planned to hold its public comment period during the height of the summer fishing season when most fishermen were out of town.

Further, DEC denied access to the statewide public teleconference held on September 25, 1992, to at least one commercial fishing group (Petersburg Vessel Owners Association) on the grounds of a minimum notice "requirement" of 60 days. According to Legislative Affairs, sites can be scheduled momentarily, however,

the ruling on additions is up to the sponsor, in this case DEC. No one contacted by UFA at Legislative Affairs or the Ombudsman's Office had ever heard of a 60-day minimum notice requirement.

UFA is extremely concerned with DEC's apparent attitude that public hearings are a nuisance and public input is to be endured rather than used to influence public policy. This attitude gives the distinct impression that the department has an agenda with pre-determined goals. For example, Dave Sturdevant stated that DEC "has no intention to weaken our water quality standards, although there are certain things we need to modify, and the standards may turn out higher or lower" (Anc. Times, 2/13/92). However, DEC's revisions make the water quality standards less stringent in nearly every instance.

DEC is proposing a fundamental shift in public policy with major technical changes in the state's management of its water resources. Basically, the DEC is advocating for state control of discharge of its pollutants into its waterbodies. While UFA supports this fundamental shift in policy, it cannot support the state's current approach which favors short-term over long-term economic benefits, risks statewide public health, and sacrifices one resource-based industry - commercial fishing - for the benefit of the timber, mining, and oil industries.

The state's efforts to decrease protections for Alaska's waters diametrically oppose national and international efforts to increase protection of waterbodies. One of the principles adopted at the Earth Summit in Rio, and supported by the United States, seeks to control land-based sources of pollution that ultimately degrade the marine environment. In his speech at the Earth Summit, Governor Hickel called on the "nations of the world ... to protect our fisheries from the waste that comes from greed." The DEC must realize that the place to start is in its own state. Alaska's industries must internalize environmental costs. We firmly believe that this can be done without imposing economic hardships. Several of our technical comments address this achievable balance.

Instead of adopting its revisions on its own time line, UFA requests the department to establish a Clean Water Task Force with representatives from all interest (timber, mining, oil, commercial and charter fishing, tourism, Natives, and environmentalists) to determine acceptable risk levels for pollutants. The task force should adopt a dispute resolution format t set pollutant criteria, and it should be chaired by an objective moderator. Information on this format can be obtained through the Harvard Center for Dispute Resolution (617) 495-1684.

Although UFA strongly believes that this is the only fair approach for changes in public policy of this magnitude, UFA has taken the time to prepare specific comments on the water quality standards. These technical comments were written by Dr. Riki

Ott, the Chair of UFA's Habitat Committee, and approved by the board. As I am sure you are aware, Riki gillnets in Prince William Sound, and has a Masters in oil pollution/marine biology from the University of South Carolina, and a doctorate in heavy metal pollution of marine sediments/fisheries from the University of Washington.

The technical comments are enclosed.

Sincerely,

Jerry McCune
UFA President

JM::phl

cc: Governor Walter J. Hickel
Charles E. Cole, Attorney General
Carl L. Rosier, Commissioner, ADF&G
John A. Sandor, Commissioner, DEC
Glenn A. Olds, Commiesioner, DNR
Kim Elton, Executive Director, ASMI
Duncan Fowler, Ombudsman
Senator Curt Menard
Representative Cliff Davidson
Prince William Sound Aquaculture Corp.

9/30/92

SPECIFIC COMMENTS OF

UNITED FISHERMEN OF ALASKA

ON THE ALASKA WATER QUALITY STANDARDS

GENERAL 18 AAC 70.010.

UFA recommends first and most importantly that DEC adopt the following narrative statement relating to toxic discharges in the general section of the water quality standards 18 AAC 70.010:

> "There shall be no discharge of toxic materials in toxic amounts. For point source discharges, this shall be interpreted as no discharges in excess of the numeric criteria for acute toxicity testing of whole effluent as measured at the end of the discharge pipe, and no discharges in excess of the numeric criteria for chronic toxicity testing of whole effluent outside the boundaries of the mixing zone."

Justification: DEC is proposing a significant shift in public policy: proposed revisions to the mixing zone regulations will allow the state to exercise full regulatory control for discharge of all types of pollutants into all state waters through mixing zones.

In the past, mixing zone discharges of "nonconventional"[1/] and "toxic" or priority pollutants were regulated jointly by DEC and EPA through federal (NPDES) permits. The state primarily regulated mixing zone discharges of "conventional" pollutants. The state has technically had the authority to regulate discharge of nonconventional and toxic pollutants since 1985. However, in practice, the state chose not to regulate these pollutants independently of EPA because the state feared lawsuits: the standards regulating discharge of pollutants into mixing zones could be broadly interpreted.

1/"Conventional" pollutants include TSS (total suspended solids), pH, BOD (biological oxygen demand), fecal coliform bacteria, and oil and grease. "Toxic" pollutants are defined by 40 CFR 401.16 and include 126 compounds considered of "priority" concern to human health. Many toxic pollutants are known or suspected carcinogens, mutagens, or teratogens. "Nonconventional" pollutants are compounds considered a health risk, but not included in the other two lists, i.e., chlorine, ammonia.

Now the state is proposing significant revisions to the mixing zone language - revisions which will provide clear regulatory (and legal) guidelines, thereby allowing the state to exercise its authority to permit discharge of pollutants into state waters with minimal federal guidance. However, with this new state authority, comes the responsibility - and the challenge - of maintaining Alaska's high water quality as mandated by the Clean Water Act. UFA believes that it is important to clearly indicate the state's intent to maintain its high water quality standards in narrative language.

Secondly, UFA strongly recommends that the state develop a "Clean Water Task Force" with representatives from all interests, similar to the Forest Practice Act Task Force, to approach the challenge of maintaining high water quality while allowing discharge of nonconventional and toxic pollutants . Past experience shows that performance of the Clean Water Task Force would be improved with an objective moderator and a dispute resolution format.

Justification: UFA could support this fundamental shift in regulatory control of pollutant discharge *only if* the state takes a responsible approach by balancing concerns from all user groups, including industry and the public. However, UFA strongly disagrees with the state's current approach, i.e., that of basing its criteria on acceptable levels of risk versus acceptable levels of protection. Instead UFA believes that:

> "(e)stablishment of acceptable risk levels for chemicals is a task for the entire society and not only for the scientific community." In risk assessment, "models (are) developed for estimating effects of exposure ... with the goal that the risk will not be underestimated" (Klaassen 1986).

UFA believes that the "task force" concept - with an objective moderator and a dispute resolution format - may be the only fair approach to policy revisions which represent such a fundamental shift, and which have the potential to dramatically affect the integrity of entire ecosystems, fish and wildlife populations, and the health, lifestyles, and livelihoods of all Alaskans.

UFA recommends the following language for:

> "18 AAC 70.010(c): If the natural characteristics of a water exceed the numeric water quality criteria for the use classes 18 AAC 70.020 and 18 AAC 70.022, [THE DEPARTMENT WILL, IN ITS DISCRETION, ADMINISTRATIVELY APPROVE THE NATURAL LEVELS AS THE APPLICABLE CRITERIA FOR CORRESPONDING USE CLASSES] no additional discharges which would further degrade the water beyond the numeric water quality criteria will be allowed."

Justification: The approach proposed by the DEC could lead to permanent deterioration of water quality. Natural background water quality often exceeds the numeric criteria on a temporary or seasonal basis. For example, high total suspended solids are associated with spring breakup and heavy rainfalls; low dissolved oxygen is associated with water under ice at the end of winter. If DEC were to establish numeric criteria on such intermittent events, water quality of entire waterbodies could rapidly deteriorate and protection for fish stocks would erode. This is not the goal of the Clean Water Act.

Further, if natural background levels do exceed the state's water quality criteria, then discharge of additional pollutants in excess of the numeric criteria should be prohibited to avoid further degrading water quality.

UFA recommends that the following language be added to:

> "18 AAC 70.010(c)(1): reducing water quality is justified because of necessary economic or social development when considering all economic and social impacts that such a reduction in water quality may have;"

Justification: UFA finds that the DEC has not considered potential economic impacts on the seafood industry which could result from deterioration of water quality due to the extremely lenient criteria for several pollutants (dioxin, arsenic, chloroform). While this is discussed extensively elsewhere, the point here is that UFA does not want the state to ignore economic impacts on the seafood industry in the future, and feels that language stressing consideration of all economic and social impacts should be included in the general narrative.

MIXING ZONES 18 AAC 70.032
(Unless otherwise stated, citations are from regulatory issue paper on mixing zones.)

UFA recommends that DEC's proposed changes be revised as follows: (Note: DEC's proposed changes so fundamentally alter this provision, justification is given for both the recommended language and the deleted DEC language, just as if the latter were already in statute.)

> (a)(1) "pollutants discharged could result in acute toxicity, or could bioaccumulate, [IN FOOD CHAINS, OR] concentrate or persist in the environment [TO A LEVEL THAT CAUSES ADVERSE EFFECTS]; cause carcinogenic, mutagenic, or teratogenic effects on the biota or on human health [AT THE LOCATION]; or otherwise present a [SIGNIFICANT] risk to human health;"

Justification: It is UFA's intent to give the state the legal definitions it needs to exercise its full authority to regulate discharge of pollutants only if the state seeks a balance that will adequately protect the health of fish, wildlife, and humans. UFA believes that addition of the language "in acute toxicity" is a critical step towards achieving this balance: this addition is prohibits discharge of toxic pollutants in toxic quantities.

DEC's proposed language "in food chains" should be deleted for several reasons. It ignores potential instances in which pollutants are bioaccumulated by individual organisms, but not bioaccumulated "in the food chain." For example, mussels bioaccumulate many different pollutants to levels many orders of magnitude higher than levels in surrounding sea water, but organisms consuming mussels may or may not bioaccumulate the same pollutants. This language ignores effects on those individual species which tend to best bioaccumulate pollutants. Further, it is far more difficult to prove that compounds bioaccumulate "in the food chain" rather than in individual organisms.

DEC's proposed language "to a level that causes adverse effects" should be deleted because this is precisely the end result the Clean Water Act is trying to prevent, i.e., adverse effects on indigenous organisms through deterioration of waterways. By the time it is possible to prove that there have been "adverse effects" in the environment, it is too late. (It should be noted that the cost of restoring water quality is often multiple millions of dollars.)

DEC's proposed language "on human health" is too narrow in scope as it ignores carcinogenic, mutagenic and teratogenic effects on the biota - fish and wildlife. DEC's proposed language should either be modified or deleted. Left unchanged, it sets a standard which is virtually impossible to prove with current science: there are few known compounds for which there is an unequivocal cause-effect relationship established in which the

chemical in question is KNOWN to cause carcinogenic, mutagenic, or teratogenic effects on humans as opposed to other laboratory animals. Establishing an unrealistic or virtually unprovable standard will allow a proliferation of mixing zones - which will essentially defeat the purpose of the Clean Water Act.

DEC's proposed language "at the location" should be deleted because it is too restrictive. It ignores potential downstream effects of effluent on fish and shellfish caught "at the location" of a mixing zone, or downstream of a mixing zone, but consumed elsewhere. Downstream effects will be of increased importance as mixing zones are permitted in rivers and streams.

DEC's proposed language "significant" risk to humans should be deleted because it is too restrictive, it may be too difficult or unrealistic to prove, (depending on the definition of "significant" - the word is too subjective), and, again, this is one of the end results the Clean Water Act is trying to prevent.

UFA recommends the following change to DEC's proposed language for:

> (a)(3) "A mixing zone will be granted only after the applicant has shown to the department's satisfaction that the 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] all technological and managerial methods available for pollution reduction and removal, and[, AT THE DISCRETION OF THE DEPARTMENT,] will be discharged in a manner that maximizes initial dispersion and dilution."

Justification: The language proposed by DEC allows for too much discretion by the department. It needs to be more definitively worded to ensure that the goals of the Clean Water Act are met. The proposed language is adopted from Washington state (WAS 173-203-100) with modification.

UFA maintains that wastewater which exceeds the state's water quality criteria MUST be treated using best available technology. The cost does not matter: if industry cannot afford to treat it, industry should not discharge it. Alaska's industries should internalize the cost of maintaining high water quality. The seafood industry cannot afford potential impacts of pollution from ineffective treatment methods. UFA notes that other states that considered economic feasibility of treatment methods, rather than sticking with a set standard, notably Washington state, are now struggling to clean up their contaminated waterways. To prevent Alaska's waterbodies from reaching this level of pollution, UFA deleted all references to "economic achievability" from the Washington state language that UFA adopted, and from DEC's proposed revisions.

If the wastewater still exceeds the state standards after best available treatment, then a mixing zone will be granted, but wastewater MUST still be discharged into an area that maximizes initial dispersion and dilution. This is to ensure that the state's water quality criteria will be met at the boundaries of the mixing zone, and also that the effluent will be rapidly diluted. It has been found that some pollutants like metals and possibly other substances have an acute:chronic ratio of 2 for embryonic and larval life stages (EPA Gold Book).

UFA recommends that a new subsection be added and the other subsections be renumbered accordingly as follows:

> "(i) mixing zones are not authorized in anadromous and resident game fish waters, and other water with resident fish species of local cultural or social significance without the express concurrence of the Alaska Department of Fish and Game; and"

Justification: UFA maintains that if the state is going to exercise its authority to regulate discharge of pollutants, then it must be done in a responsible manner that balances environmental, economic and social concerns. ADF&G has the responsibility for protecting aquatic life and its habitat: the department must be able to exercise its authority. This includes authority to protect important commercial, sport, or subsistence fish stocks.

UFA recommends the following change to DEC's proposed language for:

(e)(3) mixing zones authorized in streams, rivers or other flowing freshwaters must maintain and fully protect existing uses in receiving and upstream waters.

Justification: If mixing zones are to be allowed in streams, some of which may include anadromous and/or game fish streams, then it is important to maintain and fully protect existing uses upstream as well as downstream. Upstream uses may include fish propagation and rearing. Reproductive and genetic impairment may result in fish swimming through a mixing zone that is downstream of a fish spawning area, thereby impairing upstream use.

UFA recommends the following language instead of DEC's proposed language for:

(e)(3)(i) "mixing zones are not authorized in anadromous and resident game fish waters where the effluent flow exceeds 10 percent of the cross-sectional width of the water body or three hundred (300) feet plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; or is greater than 10 percent of the stream flow during periods of minimum flow as determined by accepted hydrologic gauging methodologies."

Justification: DEC's proposed language does not assure the goals of the Clean Water Act will be met. Under DEC's proposed language, it is possible that mixing zones could extend across the entire width of smaller (or larger) streams, thus forming a barrier to anadromous fish. This is not permitted under the Clean Water Act.

UFA's proposed language "exceeds 10 percent of the cross-sectional width of the water body or etc." adds a width restriction for mixing zones which would ensure a migratory corridor in all streams regardless of width. Ten percent was chosen to be consistent with existing (and proposed) regulatory language pertaining to mixing zones on lakes (e)(1), in addition to the rationale presented below. (It should be obvious that, under the UFA language, mixing zones would not be permitted in small anadromous streams in which this width restriction cannot be met. UFA believes this is necessary to protect existing uses in small streams which contain anadromous fish.)

UFA's proposed language is adopted from Washington (WAC 173-203-100) and Idaho (01.02060.01) with the following modifications. Washington's language was changed from 25 to 10 percent of the cross-sectional width, and from 25 to 10 percent of the flow. Further, "flow" was changed to "minimum flow." Idaho's language was changed from 300 meters to 300 feet. These modifications all reduce the maximum allowable size of mixing zones. UFA's justification for making these modifications is that, in both of these states, the original language did not prevent deterioration of waterbodies, nor did it protect existing uses as required

under the Clean Water Act. Experience has shown that damaged waterbodies are extremely expensive to repair. UFA maintains that Alaska does not have to repeat the mistakes of most lower 48 states. Further justification for the modification to Idaho's regulation is given under (e)(3)(ii).

UFA's proposed language "during periods of minimum flow" establish a base point from which to gauge stream flow similar to mean lower low water in navigational charts. Stream flow in most Alaskan streams is highly variable. Setting "periods of minimum flow" as the base to permit mixing zones not to exceed 10 percent of stream flow will ensure that mixing zones will never exceed 10 percent of stream flow during periods of low stream flow. "Minimum flow" should be statistically quantified and its definition relegated to the Clean Water Task Force where issues like the average of 3 or 7 days of low flow could be evaluated.

UFA's proposed language "accepted hydrologic gauging methodologies" recognizes that stream gauging is a site-specific measure, and that different methodologies may be more appropriate than others in different terrain.

UFA recommends the following language instead of the proposed wording for:

> (e)(3)(ii) "mixing zones shall not extend in a downstream direction for a distance from the discharge port(s) greater than three hundred feet plus the depth of water over the diffuser or point of discharge, or extend upstream for a distance of over one hundred feet."

Justification: The language proposed by DEC offers no definitive size restrictions for mixing zones in streams. It is the intent of the Clean Water Act that mixing zones must be as small as practicable. UFA's proposed language establishes a quantitative size for mixing zones and is adopted from Washington (WAC 173-203-100). To be relatively consistent with the length restrictions (maximum allowable length of 400 feet), UFA is proposing a width restriction of 300 feet - not meters - plus the horizontal length of the diffuser as measured perpendicularly to the stream flow in larger streams (see (e)(3)(i) above).

UFA recommends the following changes to DEC's proposed language for:

> (e)(3)(iii) mixing zones may not result in [PERMANENT] any displacement of indigenous organisms or [LONG TERM] any reduction in fish population levels; and

Justification: DEC's proposed language is extremely offensive to UFA. It shows a callous disregard for the short- and long-term interests of the commercial fishing industry. It also clearly

violates basic mandates of the Clean Water Act, i.e., to prevent degradation of water quality and to protect existing uses. Any reduction in fish population levels due to a mixing zone would constitute a failure by the state to protect existing uses under the Clean Water Act.

UFA recommends the following change to DEC's proposed language for:

> (e)(3)(iv) mixing zones are prohibited in anadromous and resident game fish spawning areas [EXCEPT WHERE WATER QUALITY CRITERIA FOR THE AQUATIC LIFE DESIGNATED USE ARE NOT EXCEEDED IN SUCH AREAS. AQUATIC LIFE CRITERIA MUST BE MET AT END-OF-PIPE IN SUCH AREAS]; and

Justification: UFA does not believe that mixing zones should be permitted in fish spawning areas, period. This state has exhibited an appalling inability to enforce its environmental laws. UFA has absolutely no guarantee that water quality criteria, as DEC proposes, would be enforced. This would be to the clear detriment of fisheries resources. Protecting water quality in fish spawning areas is essential to the health of the resource.

NO MIXING ZONES IN FISH SPAWNING AREAS!

UFA wishes to point out an inherent problem with allowing mixing zones in streams as encapsulated in the proposed change for:

> (e)(3)(v) "mixing zones may be limited or prohibited in other identified special resource or critical freshwater areas, including identified anadromous fish escapement index streams and etc."

Problem: One way to determine potential reductions in fish populations is from escapement data. If mixing zones are not allowed in fish index streams, (and UFA agrees with DEC that they should not be), then index streams become also "control streams." That is, index streams are supposed to be representative of other streams in the area: however, if mixing zones are not allowed in index streams, but are allowed in other streams, then the underlying assumption for fish forecasting using index streams is invalidated. Further, any reductions in fish populations from streams with mixing zones may not be readily evident based on forecast data from streams without mixing zones.

A possible solution is to have ADF&G start a separate program of indexing representative streams in which mixing zones are allowed - and having industries/persons requesting mixing zones in streams required to fund this program. UFA believes further consideration on this matter is warranted and would like the opportunity to discuss this jointly with ADF&G and ADEC.

This problem - and its solution - are just one example of the issues that could be best dealt with through a "Clean Water Task Force."

REGULATING DIOXIN
(Unless otherwise stated, citations are from regulatory issue paper (IP) or fact sheet (FS) on dioxin.)

UFA recommends for marine water adopting a dioxin standard of **0.00006 ppq** for human health based on the risk level of one in a million (10^{-6}), a fish consumption rate of 65 g/day, a bioconcentration factor of 210,000, and a cancer potency factor of 86,750.

Justification: UFA has determined, based on available information, that neither DEC's proposed dioxin criteria of 1.2 ppq nor EPA's recommended criteria of 0.014 ppq are sufficient to protect the unique circumstances in Alaska. The individual factors in EPA's formula for human health criteria are discussed separately below.

HEALTH RISK LEVELS: UFA finds that the state's rationale for selecting a health risk of 10^{-5}, as opposed to 10^{-6}, is flawed and should not be accepted. DEC states:

> "Alaska has relatively little industry to generate toxic pollutants. In the case of dioxin, the only two known sources affecting water in the state are the two pulp mills in Ketchikan and Sitka. It is these sites where the dioxin criteria would be applied to waters receiving wastewater discharges from the two mills." (IP, pg. 6.)

It should be acknowledged that DEC is proposing a statewide health risk of 10^{-5}: it will not just be applied to "the two pulp mills in Ketchikan and Sitka." Health risk levels factor into an equation to establish numeric criteria for all carcinogenic compounds, not just dioxin and chloroform. How could DEC justify regulating some dischargers at a health risk of 10^{-5} and others at 10^{-6}? UFA finds that DEC has not been up front with the public in discussing this significant issue.

Further, Alaska may have relatively "little industry" generating dioxins, but both of the dioxin-generating pulp mills have been cited by EPA for fines totaling hundreds of thousands of dollars for a variety of violations of federal laws including toxic substance, hazardous waste and disclosure laws, and clean air and clean water legislation (Anc. Daily News 8/1/91, A1; Anc. Daily News, 9/11/92). These fines are some of one of the largest environmental fines ever proposed against Alaska-based industries.

DEC is largely justifying its choice of a health risk of 10^{-5} on what DEC claims are "economic" considerations: DEC is concerned that a more stringent standard would bankrupt at least one of the pulp mills (Anc. Daily News, 9/13/92, A1). This rationale is faulty for two main reasons.

First, DEC has failed to consider economic impacts on the commercial fishing industry in proposing dioxin criterion, according to Dave Sturdevant of DEC (KCHU "Coffee Break" 9/21/92). The seafood and charter industries combined outrank the two pulp mills in terms of employment and overall value in the southeast region. Further in Alaska, commercial fishing is the largest private sector employer and the second largest revenue generator in the state: a market scare from dioxin-contaminated fish could have ripple effects statewide, much like the botulism scare in 1981 which resulted in depressed fish markets and prices for several years.

Sturdevant stated that DEC has commissioned a study from the University of Alaska to consider economic impacts on other industries, but UFA finds this action is somewhat after the fact given that DEC has proposed standards *first*, and commissioned the study *second* (KCHU "Coffee Break" 9/21/92). Further, according to Sturdevant, the study will be completed after the public comment period ends on September 30. Because of DEC's clear intentions to adopt a dioxin criterion less stringent than the standard recommended by EPA, UFA is skeptical that DEC will give adequate - if any - consideration of economic risk to the commercial fishing industry of its actions.

Secondly, DEC has failed to consider that the cost for pollution control, $100 million per mill according to company officials, is artificially inflated because these mills have not been achieving the same level of pollution control as the rest of the country. This is extremely ironic given that both these mills are owned by Outside interests at least one of which - Louisiana Pacific - is not only meeting national standards at its other mills throughout the country, but is setting new levels of pollution control.

By not requiring stringent standards (health risk of 10^{-6}) for dioxin, DEC provides no incentive for these Outside interests to incorporate (or develop) new pollution control technologies in their Alaska-based operations. For example, Louisiana-Pacific Corp. recently announced plans to produce chlorine-free pulp for paper at its plant in Samoa, CA, after a $10 million modification project is completed in 1995 (Anc. Daily News, 9/12/92, Business, pg. 2). Producing pulp without chlorine eliminates dioxin from plant effluent. Presumably, Louisiana-Pacific could develop parallel technology to produce chlorine free pulp for rayon at its plant in Ketchikan given the right economic incentives. The Japanese-owned mill in Sitka, which also produces pulp for rayon, uses about 30 million pounds of chlorine a year.

It is time for these Outside interests to internalize environmental costs at their Alaska-based plants similar to other pulp mills throughout the country. To do less perpetuates this grievous assault by Outside interests on small Alaskan-owned businesses, Alaskan public health, and Alaskan fisheries resources. The longer DEC waits to require pollution control at these two mills, the more it will cost. This artificially high

cost for pollution control should not be used by DEC as a basis for lowering the statewide health risk.

DEC argues that EPA's dioxin criteria of 0.014 ppq is undetectable and therefore, too low, implying that the criteria must be raised to the detection point to be a valid standard. However, the detection limit for dioxin is currently about 8-10 ppq, and DEC's proposed standard of 1.2 ppq is still below the detection limit. A dioxin standard of 0.014 ppq does not create a problem for pulp mills in other areas of the country which meet this standard by taking measurements from the internal wastestream in the bleach plant before it goes through treatment: if dioxin is nondetectable in this internal wastestream, then there is adequate assurance that a standard of 0.014 ppq will be achieved in the receiving waters after plant effluent is treated and diluted 100:1.

DEC has decided to allow people to take more of a chance of developing cancer or other illnesses in order to help these two pulp mills, but DEC has failed to consider that all the people may not be willing to assume that risk. UFA finds that the arguments presented by DEC in its issue paper and "fact" sheet to minimize the health risk of dioxin are flawed at best and purposely misleading at worst.

For example, DEC cites extensively from the writings of Dr. Vernon Houk, supposedly the "government's leading official on environmental hazards" (FS, pg. 8). However through inquiries, UFA determined that Dr. Houk is not actively involved in the current research on dioxin. Specifically, Houk is not the primary author on any of the articles included in the most recent EPA draft report on the health effects of dioxin - a multi-chaptered report involving leading experts from the scientific community worldwide.

Further, the scientists involved in reassessing the health risk of dioxin for the EPA report have found that while dioxin may not be as strong a carcinogen as previously thought, the effects (reproductive and developmental toxicity, immunotoxicity, and acute, subchronic, and chronic toxicity) are much stronger than EPA first predicted. While initially, the cancer risk drove the formula to establish a dioxin criteria, EPA now suspects that other effects will drive the formula in the future. Some of these effects appear to have virtually no threshold concentration, i.e., even minute amounts of dioxin could result in an effect.

Although EPA has not yet committed on this issue, it is highly likely, based on this information, that EPA's new criterion for dioxin, due after completion of the ongoing dioxin reassessment in about 1-1.5 years, will be lower than 0.014 ppq. This may be especially true in light of evidence that the present criterion may not be low enough to protect human health: humans carry a

body burden of 5-10 parts per trillion of dioxin picked up from the environment (Sturdevant, KCHU "Coffee Break" 9/21/92).

A study on bioaccumulation and toxicity of dioxin in fish found that the no observable adverse effect level (NOAEL) for the most sensitive life stage of Lake Superior lake trout - the sac fry - was 34 picogram (10^{-12}) dioxin per gram fish: using a very liberal bioconcentration factor of 51,000 for fish with 7% fat, the water concentration corresponding to the NOAEL is 0.6 ppq (Cook et. al. 1991). A more realistic water concentration assuming 100% lipid in the sac fry would be 0.04 ppq. Recent research from the Great Lakes area shows that dioxin levels as low as 0.0085 ppq are necessary to protect sensitive wildlife (EPA 1992a, pg. 23).

These are significant findings because Alaska does not have a dioxin criterion for aquatic life: by default, the human health criterion will be applied to aquatic life. In the absence of aquatic life criteria, it is important that the human health criteria for dioxin, including health risk, be protective of fish and wildlife.

UFA finds it difficult to believe that DEC was not aware of any of this information on the range of effects from dioxin as is seemingly indicated by the absence of such information in DEC's "fact" sheet, and by DEC's advocation of a higher health risk (10^{-5}). UFA considers the above rationale amply justification for maintaining a health risk of 10^{-6} one in a million.

WEIGHT: UFA accepts EPA's value of 70 kilograms as an average value for adult weight in deriving the dioxin criteria.

WATER CONSUMPTION RATE: UFA accepts EPA's value of 2 liters per day as an average water consumption rate in deriving the dioxin criteria.

BIOCONCENTRATION FACTOR: UFA finds that the bioconcentration factor (BCF) recommended by EPA and DEC - 5,000 - is unrealistically low for Alaska. Instead UFA recommends a BCF of 210,000.

Dioxin is concentrated in the lipids of organisms, i.e., the greater an organism's lipid content, the greater that organism's ability to bioconcentrate dioxin. Justification for a dioxin BCF, therefore, should involve a discussion of lipid content. It should also be noted that "bioconcentration" does not take into account dioxin entering the fish (or consumers) through the food chain, only absorption through the skin. "Bioaccumulation" takes into account all factors, (ingestion, sediment adsorption, etc.), and is the more relevant fac- (Cook 1992). UFA is basing its BCF on bioaccumulation rates.

A 1991 joint study by EPA and the University of Wisconsin on bioaccumulation and toxicity of dioxin in Great Lake fish found that the BCF for fish with 7% lipid was 51,000 under laboratory exposure conditions (Cook, et. al. 1992, pg. 143). Michigan took this finding at face value and adopted a BCF of 51,000 to establish its dioxin criterion. However, Minnesota adjusted the BCF for fish and fish life stages with lipid content greater than 7% (i.e., lake trout with 18% lipid - Cook et. al. 1991, pg. 159) and adopted a BCF of 276,000.

Certain species of salmon, sablefish, and Pacific herring are all considered "fatty" fish, i.e., fish with more than 10% fat (Sikorski, pg. 29). The lipid range in these fatty fish may range from 1% to more than 25% wet weight, depending on environmental and biological factors (Sikorski, pg. 44). For example, adult salmon returning to spawn would have highest lipid content when at "peak" condition before the fish enter the rivers and stop feeding. Commercial fishermen are, therefore, harvesting, selling, and consuming salmon at peak lipid content.

Further, the lipids are stored in the muscles and subcutaneous fat of medium-fat and fat fish which includes most all species of salmon (Sikorski, pg. 44). Retention of this fat was found to be 100% for sockeye salmon cooked four different ways (bake, broil, canning, and microwave) (Sikorski, pg. 127). This means that once dioxin is taken up by salmon, at least, there is a very high potential for human exposure through consumption.

This can also be assumed to hold true for subpopulations of Alaskans who consume the entire fish, not just the muscle tissue. Several studies performed in the Great Lake Basin on fish-eating wildlife indicate that whole fish carcasses have an average fat content of 7.9% (EPA 1991a). Further, studies have shown close agreement of dioxin concentration with the lipid percent in all fish organs (Cook et. al. 1991, pg. 165).

The latest research has found that dioxin bioaccumulation increases by a factor of 10,000-21,000 for every 1% increase in percent fat content of fish residing in large-cold temperature waterbodies with low levels of dissolved or suspended organic matter (Cook et. al. 1991; Cook, 1992). UFA calculated a BCF for dioxin based on 10% average lipid content for fish and an accumulation factor of 21,000, i.e., 10 x 21,000 = 210,000.

UFA believes that this BCF is reasonable as an interim standard to use until the EPA dioxin reassessment is completed. This standard was calculated based on bioaccumulation rates in adult fish and does not consider that younger life stages (sac fry) may accumulate dioxin at much higher rates because of their high proportion of lipid (Cook et. al. 1991). UFA believes that a BCF of 210,000 is the <u>minimum</u> necessary to protect aquatic life, particularly "fatty" fish, and that with more data, this BCF may have to be increased.

FISH CONSUMPTION RATE: UFA finds that DEC, in its enthusiasm to make the dioxin criteria less stringent for two pulp mills, has chosen an unrealistically low fish consumption rate (FCR) for Alaska, and in doing so, may have grossly underestimated the health risk from consumption of potentially contaminated seafood. UFA recommends a fish consumption rate (FCR) of 65 g/d (about 50 pounds per person per year).

DEC initially maintained that the "most recent comprehensive data available" indicate a national average for consumption of fish and shellfish of 6.5 grams/day (g/d) which translates to approximately 5 (not 7) pounds per person per year (IP, pg. 9). After public outcry over the low FCR, DEC asserted that 6.5 g/d represented consumption of *contaminated* fish only (Sturdevant, KCHU "Coffee Break" 9/21/92, and public teleconference 9/25/92). Whatever the rationale, it - and the standard - are all incorrect for several reasons.

First, according to the National Marine Fisheries Service, which updates national FCR each year in its annual publication "Fisheries of the United States", the national FCR for 1991 was 15 pounds/year or about 19 g/d. DEC chose 6.5 g/d based (initially) on EPA's standard estimate of "average consumption of fish and shellfish from estuarine and freshwaters" by the entire U.S. population (EPA 1991b, pg. 37). However, in selecting this standard, DEC fails to account for consumption of fish and shellfish from *marine* water. EPA's standard estimate of fish and shellfish consumption from all waters is 20 g/d, virtually identical to NMFS's estimate of 15 pounds/year (EPA 1991b, pg. 37).

Secondly, according to EPA-Seattle risk assessment staff, its standard FCRs are based on average fish and shellfish consumption, not average *contaminated* fish and shellfish consumption. The reason for this is the underlying assumption that some consumers may eat predominantly locally-caught fish. For example, if there is a point source discharge, like the Sitka or Ketchikan pulp mills, then there is a risk that 100% of the locally-caught fish and shellfish could be contaminated. Thus, basing a FCR on average consumption would protect these consumers.

UFA firmly believes that Alaskans consume much more than 5 or even 15 pounds of seafood per person per year. DEC acknowledges that "Alaska clearly has subpopulations of sport and subsistence fishermen who consume much greater amounts of fish than the national average" (IP, pg. 6). DEC notes that a survey conducted by ADF&G during the 1980s indicate that consumption data are "variable, ranging generally from 30 to 300 pounds per year, with a few lower values and some values as high as 700 pounds per year" (IP, pg. 6). Despite this information, DEC has selected the lowest FCR in the nation. DEC has also neglected to account

for seafood consumption by commercial fishermen, another "subpopulation" which, UFA believes, consumes more seafood than the 15 pound/year national average.

Six other states have chosen a FCR higher than the national average to protect the high end consumer - subpopulations with a high fish diet such as, in the Great Lakes Basin, subsistence anglers (EPA 1992b). Deleware has the highest FCR of 37 g/d. (Minnesota has the second highest FCR of 30 g/d.)

Based on this information, UFA proposes that DEC adopt a FCR of 65 g/d or roughly a pound of seafood per person per week. UFA maintains that DEC should use this FCR when considering health risk from all toxic and nonconventional pollutants, including dioxin, to all Alaskan residents. This FCR is especially important when dealing with areas of the state, like Sitka, Ketchikan, and other southeast communities, which have large populations of commercial and sport fisherpeople, and subsistence users.

If anything, even the 65 g/d standard is too low to protect the high end consumer. The FCR is based on "cleaned" seafood or consumption of muscle tissue only ("guts" and carcass discarded). However, many subsistence users consume the entire animal and could be exposed to much higher levels of contaminants because pollutants tend to be stored in the "guts." Further, the 65 g/d standard may be too low to protect consumers, especially high end consumers, who eat predominantly locally-caught seafood.

It is interesting to note that research from the Great Lakes Basin found that piscivorous (fish-eating) species of birds and mammals were extremely sensitive to dioxin (EPA 1992c). The overall dioxin criterion recommended to protect these species (mink, otter, eagle, osprey, and kingfisher) is 0.0085 ppg, as mentioned earlier. It is interesting to note that this low criterion was driven by the extreme sensitivity of fish-eating mammals (EPA 1992d).

DEC's assumption that "(m)ost Alaskan fish taken by sport and subsistence users [and presumably commercial fishermen although DEC never once accounts for this group] are migratory, and so would not be expected to contain the projected bioconcentration levels, even if taken from a contaminated area" (IP, pg. 6) is not valid for several reasons.

All species taken by the commercial and sport fishing industries and by subsistence users as varying amounts of time feeding in nearshore waters. The highly migratory salmon and herring feed as juveniles in nearshore areas as do the less migratory halibut, cod, ling cod, and rockfish. Comparatively nonmigratory species like crab - and other shellfish (mussels) taken by subsistence users - can spend the majority of their lives in nearshore areas.

Sublethal effects have been demonstrated with fish exposed to pulp mill effluents containing dioxin (In Cook et. al. 1991, pg. 149). Massive fish kills in Sitka's Silver Bay are a reoccurring event - 1970, 1982, 1990 - and are thought to be related to disturbances of the sludge mat, a mixture of chemicals, waste and wood fibers that carpets the bottom of parts of Silver Bay (Anc. Times, 8/15/91, A9-10). Scientists say little if anything can survive in bottom areas covered with sludge mats: at least one bottom sample of Sitka sludge analyzed by the U.S. Fish and Wildlife Service "was extremely toxic and would be toxic to almost any organism encountering it" (U.S. Fish & Wildlife Service 1990).

Despite the seemingly obvious, DEC maintains that it does not know the cause of the fish kills. DEC also claims that it does not have the expertise to determine if Sitka seafood poses a public health risk (Anc. Times 8/15/91: A1). Yet this same agency is now trying to minimize the health risk which DEC admits it has no expertise to judge. UFA requests that the agency adopt a more conservative approach by selecting an FCR of 65 g/d.

CANCER POTENCY FACTOR: UFA finds that DEC has underestimated the cancer potency factor (CPF) and recommends that DEC adopt a standard of 86,750 rather than 17,500.

Reassessment by EPA of the dioxin health risk indicates, as mentioned earlier, that the cancer potency of dioxin may not be as great once thought. The ten fold difference between the FDA and the EPA CPFs (17,500 and 156,000, respectively) can be attributed to three variables: (1) EPA accounted for the high early mortality in the early dose group (FDA did not); (2) EPA looked at a wider variety of tumor types (FDA limited their analysis to certain tumors); and (3) EPA took a more conservative approach when extrapolating the data from animals to man.

The latter variable alone accounts for nearly half of the difference between the two CPFs (Devoli 1992). The three federal agencies that have published CPFs have since agreed to an alternate extrapolation method based on body weight (raised to the 3/4 power) which will probably work to lower EPA's CPF and raise FDA's CPF, absent consideration of the two other variables. The arithmetic mean of the FDA and the EPA standards is 86,750. This is the amount of the difference between the two methods that can be attributed to differences in the extrapolation methods.

DEC is apparently willing to ignore differences between the two methods based on the other two variables, i.e., early mortality and number of tumors, and so has proposed the lowest CPF available. UFA maintains that it may not be wise to ignore these variables absent other information from the dioxin reassessment.

So at this time UFA recommends adopting a CPF of 86,750 as an interim standard. It should be noted that this reflects the current thinking that the CPF initially recommended by EPA may be too high, while the FDA factor may be too low.

REGULATING ARSENIC
(Unless otherwise stated, citations are from regulatory issue paper (IP) or fact sheet (FS) on arsenic.)

UFA recommends that Alaska adopt human health arsenic criteria of 8.2 ppt and 14 ppt for fresh and saltwater, respectively, based on a risk level of 10^{-6}, a fish consumption rate of 65 g/d, a bioconcentration factor of 44, and a cancer potency factor of 1.75.

Justification: UFA finds that the state has substantially underestimated the health risk from arsenic in order to "help the A-J and Kensington gold mines" (Anc. Daily News, 9/12/92, A1). UFA finds that this approach lacks scientifically defensible arguments.

Arsenic is a carcinogen and should be regulated as such. UFA has adopted EPA's bioconcentration factor and cancer potency factor, but selected a health risk of 10^{-6}, and a fish consumption rate of 65 g/d for reasons consistent with the discussion presented for dioxin.

Arsenic is a very complex chemical and exists in several forms, as recognized and discussed by DEC in its issue and fact papers. While UFA agrees with DEC that toxicity is associated with the inorganic form "arsenite" [arsenic(III)], DEC's implication that other forms can be ignored are without scientific basis. Arsenic cycling in marine and other ecosystems is dependent upon multiple variables, such as temperature, salinity, presence of particulates, and reduction/oxidation potential (Maher & Butler 1988, pg. 197). Many organisms are reported to influence arsenic speciation, such as bacteria, macroalgae and their epiphytes. Marine organisms in general are thought to accumulate more arsenic than fresh-water organisms (Maher & Butler 1992, pg. 197).

It is because of arsenic's complex nature - primarily, its ability to change from the nontoxic to the toxic form - that EPA recommends that health risk be determined based on total arsenic, not just concentration of arsenic(III). DEC's approach, i.e., that of assuming minimal presence of the toxic form of arsenic (III), is without scientific merit.

Further, DEC's assumption that "fish are not a significant source of inorganic, trivalent arsenic" (IP pg. 5), while true for fish from waters with low levels of arsenic, may not hold true for fish from waters with high arsenic levels. The toxic form arsenic(III) tends to be concentrated in certain organs such as the liver, gills, and heart. In many parts of Alaska, subpopulations of residents consume the entire fish. DEC's proposed criteria would not be protective of these subpopulations.

UFA recognizes that Alaska has high naturally occurring levels of arsenic. However, it is precisely because of this fact that UFA is advocating a conservative approach for regulating arsenic. Additions to the total level of arsenic already in environment would most likely result in increased levels of arsenic(III), assuming the arsenic species occur in a dynamic steady state. Allowing more arsenic to be discharged could potentially exacerbate the risk posed by the high natural background levels.

REGULATING CHLOROFORM

UFA recommends tnat Alaska adopt a human health criterion for chloroform of 5.11 ppb based on a risk level of 10^{-6}, a fish consumption rate of 65 g/d, a bioconcentration factor of 3.75, and a cancer potency factor of 0.0061.

Justification: UFA has adopted EPA's bioconcentration factor and cancer potency factor, but selected a health risk of 10^{-6}, and a fish consumption rate of 65 g/d for reasons consistent with the discussion presented for dioxin.

DEFINITION OF "WATER" 18 AAC 70.1109(46)
(Unless otherwise stated, citations are from regulatory issue paper on definition of water.)

UFA recommends that the definition of "water" NOT be amended to exclude unlined impoundments and other surface water bodies that are integral parts of wastewater treatment systems.

Justification: Unlined tailing ponds and other wastewater treatment facilities should not be allowed to contain concentrations of toxic wastes which exceed state water quality standards, because water in these facilities could contaminate ground and surface water resources, and find its way into drinking water supplies and fish spawning areas.

0.01 TIMES THE 96 HOUR LC_{50}
(Unless otherwise stated, citations are from regulatory issue paper on color, 0.01 LC_{50}, total hydrocarbons, sediment, and fecal coliform bacteria.)

UFA recommends that DEC's proposal to discontinue "0.01 times the lowest measured 96 hour LC_{50}" as a term to establish water quality criteria for toxic substances be approved. However, UFA recommends that the DEC adopt in its place a provision requiring mandatory application of chronic water quality criteria based on direct "No Observed Effects" toxicity testing for total hydrocarbons. UFA recommends the following changes be adopted for the narrative criteria for:

Toxic Substances

Substances shall not [INDIVIDUALLY OR] in combination exceed, at the end of the discharge pipe, [0.01 TIMES THE LOWEST MEASURED 96 HOUR LC_{50} (SEE NOTE 8)] acute criteria based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA, or exceed criteria cited in EPA, Quality Criteria for Water (See Note 5) or Alaska Drinking Water Standards (18 AAC 80), whichever concentration is less. Individual substances shall not exceed, at the end of the discharge pipe, acute criteria based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA. Substances shall not ... etc., Notes 5 and 8)."

Petroleum Hydrocarbons for Aquaculture

Shall not exceed [0.01 TIMES THE CONTINUOUS FLOW 96 HOUR LC_{50} OR, IF NOT AVAILABLE, THE STATIC TEST 96 HOUR LC_{50}] chronic toxicity criteria for whole effluent for the species involved. (See Notes 8 and 9). Total aromatic hydrocarbons in the water column shall not exceed 10 ug/l (See Notes 9 and 10), or exceed criteria [ESTABLISHED AT THE DEPARTMENT'S DISCRETION,] based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA [OR OTHER METHODS APPROVED BY THE DEPARTMENT]. Concentrations ... etc., from floating oils."

Petroleum Hydrocarbons for Fresh and Marine Waters for "Growth and Propagation of Fish, Shellfish,, Other Aquatic Life, and Wildlife":

"Total hydrocarbons in the water column shall not exceed 15 ug/l, or [0.01 OF THE LOWEST MEASURED CONTINUOUS FLOW 96 HOUR

LC_{50}] exceed chronic toxicity criteria for whole effluent based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA, whichever is less (See Notes 8 and 9). Total aromatic hydrocarbons in the water column shall not exceed 10 ug/l, or [0.01 OF THE LOWEST MEASURED CONTINUOUS FLOW 96 HOUR LC_{50} FOR LIFE STAGES OF SPECIES IDENTIFIED BY THE DEPARTMENT AS THE MOST SENSITIVE, BIOLOGICALLY IMPORTANT SPECIES IN A PARTICULAR LOCATION, WHICHEVER CONCENTRATION IS LESS] exceed criteria based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA (See Notes 9 and 10)." (Note: remainder of narrative criteria for fresh and marine waters unchanged.)

Justification: Basically, UFA is recommending substitution of the outdated chronic toxicity test, based on 0.01 times the 96 hour LC_{50}, with the new chronic toxicity test based on "No Observable Effects Level" as is currently accepted by the scientific community. This is exactly what DEC is recommending for total aromatic hydrocarbons.

However, DEC is recommending discretionary application of the chronic toxicity test. UFA recommends mandatory testing as was previously required.

UFA proposed changes under "Toxic Substances" (i.e., "at the end of the discharge pipe") are consistent with our philosophy that discharge of toxic substances in toxic quantities should be prohibited. This discussion is expanded under justification for acute and chronic toxicity testing for whole effluent.

UFA believes that the state should assume responsibility for discharge of its pollutants into its waters *only if* the state clearly demonstrates its intent seek a balance among all user groups and the public health. This responsibility is not something to be taken lightly. There is more to it than simply dumping pollutants into state waters: there is a great deal of work in terms of monitoring, regulating, and enforcing state standards. The state should not be allowed to exercise its authority to control discharge of pollutants unless the state demonstrates it clearly intends to monitor, regulate, and enforce its standards. Further, monitoring itself must be conducted with rigorous scientific methodology, including standardized protocol and quality control/quality assurance: methodology should be approved by EPA.

To require any less of the state invites disaster.

UFA

The major difference between UFA's and DEC's language is that DEC recommends dropping the standard for total hydrocarbons, while UFA does not. This is discussed elsewhere.

TOTAL HYDROCARBONS
(Unless otherwise stated, citations are from regulatory issue paper on color, 0.01 LC_{50}, total hydrocarbons, sediment, and fecal coliform bacteria.)

UFA recommends that the standard for total hydrocarbons be changed as follows:

> "Total hydrocarbons in the water column shall not exceed 15 ug/l, or [0.01 OF THE LOWEST MEASURED CONTINUOUS FLOW 96 HOUR LC_{50} FOR LIFE STAGES OF SPECIES IDENTIFIED BY THE DEPARTMENT AS THE MOST SENSITIVE, BIOLOGICALLY IMPORTANT SPECIES IN A PARTICULAR LOCATION] exceed criteria based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA, whichever concentration is less. Total aromatic hydrocarbons in the water column shall not exceed 10 ug/l, or [0.01 OF THE LOWEST MEASURED CONTINUOUS FLOW 96 HOUR LC_{50} FOR LIFE STAGES OF SPECIES IDENTIFIED BY THE DEPARTMENT AS THE MOST SENSITIVE, BIOLOGICALLY IMPORTANT SPECIES IN A PARTICULAR LOCATION] exceed criteria based on the "No Observed Effects Level" of chronic toxicity as determined through toxicity testing of the most sensitive and biologically important life stages of resident aquatic organisms using methods approved by EPA, whichever concentration is less. Concentrations of hydrocarbons, animal fats, or vegetable oils in the sediment shall not cause deleterious effects to aquatic life. Shall not cause a film, sheen, or discoloration on the surface or floor of the water body or adjoining shorelines. Surface waters shall be virtually free from floating oils. 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)."

Further, UFA recommends changing the method specified in the definition of "total hydrocarbon" to methodologies specific to sewage wastewater treatment (total hydrocarbons, including animal and petroleum), and petroleum wastewater treatment.

Justification: The following discussion will focus solely on proposed deletion of the total hydrocarbon standard. Justification for substitution of chronic toxicity tests (chronic toxicity criteria based on NOEL for "0.01 of the lowest measured continuous flow 96 hour LC_{50}") is discussed elsewhere.

UFA finds that DEC's rationale for dropping the total hydrocarbon (TH) standard defies logic. Basically, the department is maintaining that the methodology for measuring total hydrocarbons is incorrect and, therefore, the TH standard needs to be dropped. DEC maintains that the required method is "erroneous" because (1)

it measures both dissolved and particulate hydrocarbons, and (2) the state's TH criterion of 15 ppb exceeds the detection limits of the methodology (200 ppb).

First, it is DEC's premise that TH should only measure soluble or dissolved TH, not all hydrocarbons, (i.e., dissolved, emulsified and particulate) that is erroneous. DEC maintains that the "dissolved biologically available hydrocarbons are the principal fraction affecting aquatic organisms" (pg. 10). This is simply not true: particulate hydrocarbons are biologically available to - and affect - filter feeders.

Particulate hydrocarbons are the principal component of a major source of oily waste generated by petroleum operations, i.e., oily sludge. Particulate hydrocarbons in oily waste are composed to a large extent of high molecular weight polynuclear aromatic hydrocarbons (HPAH). HPAH as a class tend to be persistent in the environment, readily transferable among organisms, and associated with sublethal effects such as reproductive impairment, liver dysfunction, hepatic tumors, etc. across a wide spectrum of organisms.

Under DEC's proposed revisions, unmonitored discharges of particulate hydrocarbons could be released into receiving waters. In some areas, this could have potentially enormous environmental impacts. For example, the Alyeska oil terminal in Port Valdez has a ratio of TH to total aromatic hydrocarbons (particulates to dissolved) in excess of 560 to 1 (IP, pg. 10). That is, the overwhelmingly dominant form of hydrocarbon in Alyeska's effluent is particulate hydrocarbon, released with about 1.5 tons per day of total suspended solids (TSS). According to data collected by Alyeska's contractors, the dominant taxon group in the Port Valdez benthos is a tiny filter feeder. Increasing the discharge of particulate hydrocarbons could affect both filter feeders and higher organisms, as filter feeders assimilate the particulate hydrocarbons and introduce HPAH into the food web (McCain et. al. 1990).

Based on its assumption that only total soluble hydrocarbons should be measured, DEC states that the method specified in the Water Quality Standards for measurement of TH is "erroneous" because it measure oil and grease, i.e., particulate as well as dissolved hydrocarbons (pg. 10). DEC claims that this "appears to be an inadvertent error not caught when the criterion and definition were adopted" (pg. 10). Nothing could be further from the truth: this method was selected because it does in fact measure TH, both dissolved and particulates. UFA supports continued use of this methodology.

Regarding DEC's second premise, DEC maintains that because the TH criterion is below the detection level of the required method, the standard itself should be dropped. DEC's rationale for dropping the standard is that most other states with numeric criteria for TH express them as ppm (parts per million) rather

than ppb (parts per billion) as Alaska, "making them less stringent than Alaska's criterion by roughly three orders of magnitude" (pg. 10).

The state has stringent standards for TH because Alaska led the nation in developing hydrocarbon standards based on Alyeska's promise in 1973 to use of Best Available Technology for the terminal pollution control equipment. But right from the beginning, Alyeska has lobbied regulators to reduce these very standards. In the late 1970's, Alyeska lobbied to increase the size of its mixing zone to accommodate its effluent when it was determined that water quality standards were not being met. Alyeska's wish was granted. In the late 1980's, Alyeska lobbied to increase the limit for flow rate and TSS (so it could legally increase its discharge of oily sludge - particulate hydrocarbons), despite evidence that removal of hydrocarbons would not be optimal at the higher flow rate. Alyeska's wish was granted again. Now Alyeska is lobbying to remove the state's standard for particulate hydrocarbons altogether so it can legally discharge unlimited quantities of oily sludge, despite evidence that HPAH are accumulating in the bottom sediment of Port Valdez (Feder & Shaw 1992). It is time to draw the line and require Alyeska to use Best Available Technology to control its particulate hydrocarbon emissions.

It is important to recognize that the total hydrocarbon standard applies to all facilities that discharge oily wastewater, not just Alyeska. This includes domestic sewage treatment facilities. In light of this, UFA would like to point out a substantive problem with method 503B: it may not be ideal to use the same analytical method to monitor TH from sewage wastewater treatment facilities and from petroleum-based wastewater treatment operations. Method 503B measures TH in terms of animal and petroleum hydrocarbons. Method 503E, for example, measures total petroleum hydrocarbons. While neither of these methods have detection limits as low as 15 ppb TH, according to Dr. Ihor Lysyj, an analytical chemist, "there are analytical procedures that can measure hydrocarbons, individually or collectively, at the 1 ppb level" (personal communication). However, it will take some research to determine the appropriate methodology: this is another example of an issue that could be dealt with by a Clean Water Task Force.

While DEC recommends deletion of the TH criterion, it recommends "retention of the narrative standard prohibiting hydrocarbons in sediments and prohibiting surface sheens" (pg. 11). UFA finds that this makes little sense. If the TH criterion is removed, the result will almost surely be an accumulation of hydrocarbons in the sediment as particulate hydrocarbons tend to settle to the bottom (as demonstrated by Alyeska's environmental monitoring data). Further, if industries are not required to monitor particulate hydrocarbons as a component of TH, then the state will not be able to identify the source of the particulate

hydrocarbons in the sediment, and will not be able to hold a party accountable for cleanup, if necessary.

Further, surface sheens become visible at approximately 10 ppm (parts per million), according to Dr. Lysyj, which is 667 times more oil than the current TH standard of 15 ppb. UFA does not recommend substituting the state's numeric criterion for TH for a narrative as nebulous - and as high - as "visible sheen."

The wording regarding organoleptic tests is currently in the state standards and appears to have been inadvertently left out of the revisions.

LIMITING ACUTE AND CHRONIC TOXICITY OF WHOLE EFFLUENT
18 AAC 70.022
(Unless otherwise stated, citations are from regulatory issue paper on chronic toxicity testing of whole effluent.)

UFA strongly recommends that the state adopt an acute toxicity criteria for whole effluent in conjunction with the proposed addition of chronic toxicity testing for whole effluent to read as follows:

> "18 AAC 70.022. ACUTE AND CHRONIC TOXICITY OF AN EFFLUENT. The acute toxicity of an effluent discharged to waters of the state, measured at the point of discharge, shall not exceed 0.3 acute toxic units (TU_a). The chronic toxicity of an effluent discharged to waters of the state, 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 toxic units (TU_c).
>
> The department will require in its permits and certifications that acute and chronic toxicity testing of the whole effluent be conducted by the applicant to determine compliance with these criteria. Testing shall be based on the "No Observed Effects Concentration" according to methods and procedures approved by the U.S. Environmental Protection Agency. Testing must utilize sensitive standard bioassay organisms and the most sensitive and biologically important life stages of at least three resident species from ecological diverse taxa."

UFA further recommends that the state not adopt chronic toxicity testing without acute toxicity testing for whole effluent.

Justification: According to EPA's notice of March 9, 1984, (Federal Register Vol. 49, No. 48, pg. 9017), regarding development of water quality-based permit limitations for toxic pollutants, it is national policy that "all states have water quality standards which include narrative statements prohibiting the discharge of toxic materials in toxic amounts."

EPA's rationale in setting a general standard of "no toxic materials in toxic amounts" is that "for toxic and nonconventional pollutants it may be difficult in some situations to determine attainment or nonattainment of water quality standards and set appropriate limits because of complex chemical interactions which affect the fate and ultimate impact of toxic substances in the receiving water. In many cases, all potentially toxic pollutants cannot be identified by chemical methods."

By examining whole effluent toxicity and instream impacts using biological methods, it becomes possible to establish toxicity for toxic and nonconventional pollutants on a site specific basis.

Therefore, by requiring all states to adopt a generic standard of "no toxic materials in toxic amounts," it is possible to strive for and to maintain clean water in virtually all discharge scenarios.

According to EPA (1991b),

> "(a)t present, there are no national criteria developed under (Clean Water Act) Section 304(a) for whole effluent toxicity. Acute and chronic toxicity units (TUs) are a mechanism for quantifying instream toxicity using the whole effluent approach.
>
> "EPA's recommended magnitudes for whole effluent toxicity are as follows ...: a CMC (criteria maximum concentration) to protect against acute (short-term) effects and a CCC (criteria continuous concentration) to protect against chronic (long-term) effects (emphasis added). For acute protection, the CMC would be set at 0.3 acute toxic units (TU_a) to the most sensitive of at least three test species. For chronic protection, the CCC should be set at 1.0 chronic toxic units (TU_c) to the most sensitive of at least three test species" (pg. 35).

According to DEC, "(t)he State of Alaska does not apply acute aquatic life criteria at the boundary of the mixing zone, and does not propose to apply an acute limit on whole effluent toxicity at this time" (IP pg. 4). The state reasons that "(i)n most cases, the chronic toxicity limit is expected to be more stringent than the acute toxicity limit" (IP pg. 4).

UFA finds that these two statements by DEC indicate either a reprehensible lack of understanding of the nature and the effects of whole effluent toxicity, or are a calculated attempt further weaken the state's water quality standards. Of course acute aquatic life criteria are not applied at the boundary of a mixing zone: the whole purpose of a mixing zone is to dilute industrial wastestreams, usually by a hundredfold minimum, so that chronic criteria can be applied at the boundary of a mixing zone. Yes, in most cases, the chronic toxicity limit will be more stringent than the acute toxicity limit, but in most cases, that does not matter.

Under DEC's proposal, an industry could release a slug of extremely toxic material into the mixing zone. The toxic materials could then be diluted and successfully meet the chronic criteria for whole effluent. (EPA recommends an averaging period of 4 days for chronic criteria. That is, "the 4-day average exposure should not exceed the CCC" (EPA 1991b, pg. 35).)

This is a very significant issue in Alaska where many aquatic organisms are migratory. Migratory and other species swimming through a mixing zone during a release of extremely toxic materials could be exposed to lethal doses of pollutants. Also,

planktonic life stages of fish, shellfish and other organisms drifting through a mixing zone could also be exposed to lethal doses of pollutants.

It is also important to realize that some pollutants are extremely fast-acting and that it is possible for organisms to receive lethal doses of such chemicals during very short exposure times (e.g. ammonia, hydrogen sulfide). EPA recommends an averaging period of one hour for acute criteria. That is, "to protect against acute effects, the 1-hour average exposure should not exceed the CMC" (EPA 1991b, pg. 35).

DEC acknowledged that, by not adopting acute toxicity testing criteria for whole effluent, industries could discharge slugs of toxic materials into state waters, but rationalized that industry could not do this repeatedly without noticeable impacts on the environment (Sturdevant, KCHU "Coffee Break", 9/21/92). This rationale illustrates the extremes to which the state is willing to risk Alaska's high quality waters to benefit "dirty water" industries. The object of the state's water quality standards should be to prevent deterioration of its water bodies as mandated by the Clean Water Act, not to repair the water bodies after there has been "noticeable" harm.

EPA discusses four alternative ways to prevent lethality to organisms passing through the mixing zone (EPA 1991b, pg. 71). Of these, UFA recommends the first: "prohibit concentrations in excess of the CMC in the pipe itself, as measured directly at the end of the pipe." This is consistent with UFA's recommendation to include a narrative prohibiting discharge of "toxic materials in toxic amounts" as discussed earlier.

Prohibiting discharge of toxic materials in toxic amounts becomes more important now that the 100-to-1 safety margin for error, built into the chronic toxicity test of "0.01 times the 96 hour LC_{50}," has been eliminated. The replacement "NOEC" chronic toxicity test does not have such a safety margin. During periods of "upset" conditions, for example, it would be more likely under the new standards to exceed the chronic toxicity criteria.

<u>UFA maintains that chronic criteria for whole effluent testing cannot be applied independently of acute criteria for whole effluent testing without undermining the basic goals of the Clean Water Act</u>. To attempt to do so allows industry an opportunity to pollute.

UFA finds that DEC's proposed phrases regarding methodology ("to the extent feasible," and "alternative methods...specified by the department") leave too much to the discretion of DEC. If standardized protocols are not followed, and if tests are not conducted with the most sensitive and biological important life stages, as recommended by EPA (EPA 1991b, pg. 35), test results could be meaningless. Further, since the NOEL chronic toxicity testing is in its infancy, some applicants may wish to use

standardized test organisms as a check against the resident species.

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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: November 15, 1992

Larry Glackin

Larry Glackin, Acting Mayor
Haines Borough

Attest: Becky Mitchell

Becky Mitchell, Borough Clerk

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October 30, 1992

Certified Mail
P 426 920 975

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

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 photosythesis 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 lso suggested that larger molecules that absorb ligh. 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 must as 10% of the value of the final pulp product. This is a considerable cost burden for a product who's 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 <u>at complete mixing</u>. 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.

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

PL573H

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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

Gary N. Cherr, Ph.D.
University of California, Davis
Bodega Marine Laboratory
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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

KFP
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(907) 562-3335 FAX (907) 562-0999

Cliff Davidson
Chairman, House Resources Committee
State of Alaska
P. O. Box V
Juneau, Alaska 99811

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 of 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,

Joe Wehrman

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 these most important policy decisions for our future.

Thank You,

Gershon Cohen

Alaska Health Project

Information and advocacy on occupational and environmental health.
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September 23, 1992

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

Proposed Revisions to Water Quality Standards

Dear Mr. Sturdevant:

Thank you for this opportunity to comment on the proposed revisions to Alaska's water quality standards. Our comments are summarized in this letter. Detailed comments and recommendations are enclosed in Attachment A.

Because water supply and quality is essential to human and environmental health, it is invaluable. We oppose revisions which would allow degradation of water quality. Alaska is fortunate to have many pristine watersheds. The amount of water available does not make this resource less valuable. Good water quality is essential to protect the quality of life in Alaska and the livelihood and welfare of Alaskans who rely on aquatic resources.

Anti-degradation

The most cost-effective and efficient way to control pollution is not "dilution," but prevention, such as reducing, treating, and containing waste at the source. The state legislature established a policy of pollution prevention in Alaska Statute 46.06.021 for solid and hazardous waste management. This policy is equally applicable for discharge of wastes to water. The federal Clean Water Act requires a policy of anti-degradation and establishes that discharge of wastes to our nation's waters is not a right, but a privilege to be granted only when water quality is protected and it is in the public interest to do so. The revisions proposed by the ADEC should not be adopted in their current version, because by allowing water quality degradation, the state proposes to give up its citizens' right to unpolluted water.

Toxicity Standards

Toxic effects from carcinogenicity, mutagenicity, teratogenicity, and bioaccumulation should all be prohibited.

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) ~~(c)~~ 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 anythi , pollutants are typically more persistent in groundwat due to less mixing, dispersion, and dilution, less aeratio d biological activity, and soil which can alternately adsor 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 <u>INCORRECT</u>.

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.

aire #3

<u>LOEL</u>
Water quality Standard Questionnaire #3 <u>INCORRECTLY</u> 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 <u>ANY</u> effect regardless of whether or not the effect is adverse.

<u>NOEL</u>
DEC's reasoning is intrinsically flawed because toxicological methodology uses the <u>NO</u> 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, ~~T~~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 consid red 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. <u>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.</u> 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 <u>existing and potential</u> 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~~ <u>existing and potential</u> beneficial uses are protected.

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

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 carcinogenity; 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 carcinogenity in humans and sufficient evidence in animals, and "B2", for which there is inadequate evidence or no data for carcinogenity 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:

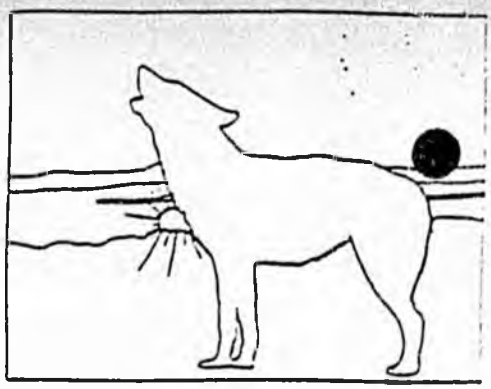
"The lowest concentration that results in statistically significant adverse effects is recorded as the LOEL of LOEC."

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.

The Congress, in 1978, established the Science Advisory Board to provide independent scientific and engineering advice to EPA and to those committees of Congress responsible for environmental matters (EPA Journal, March/April, 1991)



#3 Water Quality Standard Review Questionnaire\January 1992

1. Should the LOELs shown in Table 1 of the Workbook be included in a similar table in the WQS?

   A. If they are included, what kind of qualifying narrative, if any, should be included to address the fact that some of the criteria may not provide sufficient protection?

2. If the LOELs are not used for those 58 compounds, what criteria could replace them, if any?

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you need more space please add attached pages. If you have further questions feel free to call Katy Wilkinson at 465-5302.

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?

#6 WATER QUALITY STANDARD QUESTIONNAIRE/FEBRUARY 1992

Respondent's Name _____

Agency or Company _____

1. Should the Total Hydrocarbon criterion of 15 ppb be retained as a measure of the water soluble fraction of petroleum?

Yes ☐ No ☐

2. Should the total hydrocarbon criterion be revised with clear identification of the method of analysis to define what is meant by total hydrocarbons?

Yes ☐ No ☐

3. Should the total hydrocarbon criterion be omitted because it is duplicative of the TAH criterion or because it is based on the 1.5 to 1 TH:TAH toxicity ratio?

Yes ☐ No ☐

If you have further comments or suggestions please write them below.

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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.

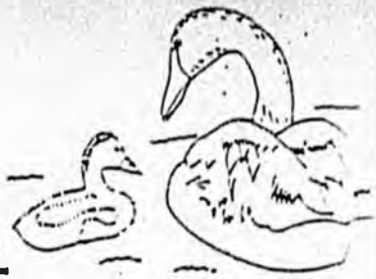
Questionnaire #7 CYANIDE

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.

_____

_____

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_____

_____

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
Lahontan 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 carcinogenity 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 Labled "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 Patapasco 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 embryo-larval 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; Fatnead Minnow (Pimephales promelas) Larval Survival and Tetragenicity Test Method 1001.0, Section 14; and, Selenastrum capricornutum Growth Test Method 1003.0, 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:

Parameter	Units
Lake elevation	feet
Temperature	$^{o}C/^{o}F$
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.

Attachment

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 13389. 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.

This is standard already monitored

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.

This is probable

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.

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

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
Dept./Agency	Phone # 206 553 2116
Fax # 907/561-7812	Fax #

206-553-0165 FAX

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

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 observalbe 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 <u>acute</u> 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

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:

State	Consumption Rate (grams per day)
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.

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of a total maximum daily load for dioxin in the Columbia River Basin.

- A publication by Paul Mehrle et al. entitled, "Toxicity and Bioconcentration of 2,3,7,8-Tetrachlorodibenzo-dioxin and 2,3,7,8-Tetrachlorodibenzofuran in Rainbow Trout." Mehrle and his co-workers found that trout exposed to 38 ppq of dioxin for 28 days, followed by a depuration period of 28 days, suffered 45% mortality. This concentration (38 ppq) was the lowest concentration tested, thus a no-observable-effect concentration (NOEC) could not be calculated.

- A publication by Phillip Cook et al. entitled, "_____." This publication appeared in the proceedings of the 1990 Banbury conference on dioxin. The publication contains information on the effects of dioxin on aquatic life. Of particular note were the results of maternal transfer studies on Lake Trout, which indicated a NOEC of 30 parts per trillion (ppt) for Lake Trout eggs. Related studies indicated a bioconcentration rate of 180,000 (this rate was specific to Lake Ontario).

- A publication by Barry Walker, entitled "_____." This publication provides dose-response data for aquatic organisms exposed to dioxin.

- Draft dioxin criteria developed for the protection of birds and mammals as part of EPA's Great Lakes Water Quality Initiative. The draft criteria are 0.14 ppq for the protection of birds and 0.0085 ppq for the protection of mammals. This analysis was provided to the FWS as part of EPA's Endangered Species consultation for the Columbia River dioxin total maximum daily load.

In conclusion, while the proposed criterion for protection of human health is equivalent to those approved by EPA in some other states, concerns about the potential impacts of this concentration on fish and wildlife lead us to encourage ADEC to evaluate whether protection of aquatic resources and wildlife should be considered as part of the current standards revision. We suggest you contact Carol Shuler of FWS for further information (503/231-6169). Her address is 2600 S.E. 98th Ave., Suite 100, Portland, Oregon, 97266.

Chloroform

The state is proposing application of EPA human health criteria for all uses except drinking water supply at 4700 ug/l

(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 expect 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.
1818 W. Northern Lights Blvd., Suite 103, Anchorage, Alaska 99517
(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) <u>Enforce the Anti-Degradation Policy</u>
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

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 propcsed 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.

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 to 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

1350 New York Avenue, N.W.
Suite 300
Washington, DC 20005

VOICE Telephone: 202-783-7800
FAX Telephone: 202-783-5917
TCN/Dialcom ID : 141:TCN902
MCI Mail ID : 414-0393
IGC EcoNet ID : nrdcdc

TO: Marna Schwartz, Eric Jorgenson, Mike Wenig

FROM: Bob Adler

DATE: 06 October 1992 - 13:56 Eastern Time

NO. PAGES: including cover

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 subsistance 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.

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

Sincerely,

Jim Cariello

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.
3111 C. St.
Anchorage, AK. 99503

DATE: 10/26/92

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

26-30

A copy of this testimony was transmitted to your committee via fax on #561-7617 [10/26/92].

Thank you,

Wayne Parker

10/9/92

Hello Cliff,

I understand you're the Chairperson 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 fisheries, 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 harmfull to the marine environment and could adversly affect our marketing reputation for clean fish, plus our future generations would like inheriting a cesspool!

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

Thanks

Wayne Parks
Box 845
Petersburg, Ak 99833

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: Meredith Marshall
Testifier

Representing (Optional)

P. O. Box 7418 Ketchikan, AK 99901
Address

Phone No.

9/86 Legislative Information Office

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 reproduciblility. 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 prcposed 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 no 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 isn't a municipality, industrial concern or small business that can meet these standards. Examples being - fish processing plants, sports fishing lodges or business of 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. By attempting to unnecessarily burden industry you negate

any attempts local governments are making to attract new industry and jobs to our state. We are living in a time of declining state revenues. Often the last money is gone its corporate income tax that's going to be paying state expenses.

Area K Seiners Association
P.O. Box 2399 Kodiak, Alaska 99615
Phone 486-4686 FAX 486-7655

October 22, 1992

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

Dear Sir:

The proposed Alaska water quality standards are deficient in setting standards that protect Alaska's fresh and salt water habitats. The criteria for determining acceptable risks for aquatic life and humans is based on the least protective values and totally unrealistic low consumption data.

If the intent of enacting standards that are more polluting than National Toxics Rules, and do not meet the Clean Water Act is to promote economic prosperity in Alaska, then this is a misguided and short sighted strategy. By reducing the production costs of a polluting development at the expense of existing and future enterprises that are habitat dependent, is economic displacement at best, with net loss to the habitat and quality of life for all. Responsible development is like being a good neighbor. You don't throw your garbage in your neighbor's yard.

We are requesting you review the technical comments submitted by United Fishermen of Alaska and integrate these in the water quality standards for the state of Alaska. In the event that this administration does not adopt UFA's criteria into the standards, we request that a Clean Water Task Force be established with a dispute resolution format.

Sincerely,

Area K Seiners Board of Directors

Bruce Schactler	Oliver Holm
Chip Treinen	Eric Manzer
Chris Berns	Tony Jones
Tom Dooley	

cc: UFA
EPA
Governor Hickel
Senator Fred Zharoff
Representative Cliff Davidson

October 28, 1992

Stosh Anderson
Box 210
Kodiak, Alaska 99615

Dave Sturdevant, DEC
Water Quality Management
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801-1795

Dear Sir,

Alaska's fresh and salt water habitats are not protected adequately by the proposed regulations DEC has been promoting. The standard suggested uses the most liberal discharge criteria in every case with a compounded accumulated effect. The consumption of domestic foods as outlined is not representative of the total Alaska population and certainly not representative of subgroup populations. The error in this single factor increases exposure to the sub-population by 20 to 30 times. The decision to use 10^3 instead of 10^6 or ^{7} as acceptable human affliction rate is arbitrary and not in the public interest.

The administrations directive to factor economic considerations into DEC standards to promote development has proceeded with a short term perspective. It is not in the public's interest to degrade the habitat so habitat dependent industries are less productive. Decreasing human productivity due to medical problems with increased health care costs to the individual and industry does not increase industrial productivity.

I am requesting you review the technical comments submitted by UFA and integrate these into the water quality standards. In the event that this administration does not adopt UFA's criteria into the standards, I request that a Clean Water Task Force be established.

Sincerely,

Stosh Anderson

Stosh Anderson

cc: Davidson
EPA
Hickel
UFA
Zharoff
file DEC92rSA.ltr

28 October, 1992

Stosh Anderson
Box 310
Kodiak, Alaska 99615

Glenn Olds, Commissioner
Department of Natural Resources
400 Willouhby Street
Kodiak, Alaska 99801

Re: Proposed Fee Regulations

Dear Sir,

I was notified this morning that the comment period was extended to 30 October, 92. This notice was to me as an individual and has not addressed the fact that the Division of Water has not notified the public through their standard mailing list. It is my concern that industry and the public, which may have been legally noticed, have not been informed and practical notice has not been accomplished. Further, provisions in HB 596 that provides the framework for the water related fee regulations have more aspects than have been addressed by these regulations. It would be more comprehensive and logical to handle all the water related regulations to implement HB 596 at one time. It is my hope that any further water regulations would be handled in a complete program package. With the philosophy of the Department and the justification of how quantities and fees have been generated.

11 AAC 05.010 (8) ( )

(L) Staff Time:
What does research mean? Under (M) is this the fee that would be charged or is adjudication staff time a different rate?

(M) Inspection Fee:
This is too open ended. There needs to be guideline as to when and under what circumstance this will be implemented.

(N) Variable Fee:
As administrations and political agendas change this provision could be misused to discriminate with increased or decreased adjudication costs depending on use or user. If the nature of use is a factor in adjudication fees, than a schedule and criteria needs to be set out. If the costs of adjudication are so varied that an average cost and related fee is not in the public's interest then a rate schedule needs to be set out. This may be a function of the nature

of use or some other factors.

(O) Conservation Fee Water Right

Does person or related persons include corporations? It is not clear as to what "total amount of water appropriated" includes. Is this the total from one point of appropriation, reach, watershed, all of Alaska or hydrological unit? It is my recommendation that hydrological unit be the accumulative unit. As there is no documentation for these rates in the proposed regulations it is difficult to make a meaningful comment on the quantity of water in each bracket or the related fee.

(O) (i - xi) fee schedule:

It is unclear as to the intent of this schedule. Are the fees graduated or are the fees day one, based on the greatest fee rate. It is my recommendation that the total usage set the fee rate bracket, day one concept.

(O) (xi) variable rate:

This is a substantial amount of water and money. The impacts on the resource and influence of money on the decision process is substantial. If a fixed rate schedule is not appropriate then the method and factors to be considered should be laid out.

(P) Conservation Fee Contract Purchase

I see no need for two rate structures with one giving a considerable reduction in fees. If the justification is that contract sales does not take the ownership out of the public domain this will be compromised by long term contracts. If this is truly a conservation fee and not a revenue generating end run, then the public and the courts would see no justification for a discounted state sales program.

11 AAC 05.10

(C) @ (E) interagency fees

It is not in the publics interest for one agency to charge another agency for services or land use. This is a run on the budget of one agency by another with no benefit to the public with increased accounting costs. Agency budgets need to established in the legislative process not by interagency raids. I am requesting that I be placed on the mailing list or lists for information and regulations DNR is distributing.

Sincerely,

Stosh Anderson

cc: Governor Hickel
Legislators
file DNR90RSA.ltr

Southeast Alaska Conservation Council

SEACC 419 Sixth Street, Suite 328 Juneau, Alaska 99801 (907) 586-6942

Chairman Cliff Davidson
House Resources Committee
3111 C. St.
Anchorage, AK 99501

October 10, 1992.

Dear ~~Representative Davidson,~~ cliff

We greatly appreciated your committee holding an oversight hearing on the Alaska Department of Environmental Conservation's proposed revisions to the state water quality standards.

Clean water and stringent water quality standards are critical to our membership. Clean water supports abundant fish and aquatic life populations and keeps those who live near the water healthy. As fishermen, subsistence users, tourism operators and Alaskans, we believe that these revisions could seriously jeopardize our income, food supply and health.

We hope that you and the committee remain involved with this issue. Once ADEC and EPA meet and come to an agreement on acceptable revisions, we hope that the committee will take another look at the proposals. Also, we believe that mixing zones, in whatever form, are an issue that the Legislature should clearly investigate. A legal lisence to operate in violation of state standards is unacceptable.

Once again, we thank you and your staff for your interest and hard work in making certain that Alaska's water remains among the most pristine in the world.

Sincerely,

Marna Marna Schwartz

Marna Schwartz
Water Quality Project Coordinator

RDC

Your Comments Are Urgently Needed

The Alaska Department of Environmental Conservation is accepting comments on its proposal to revise Alaska's water quality standards. Under the federal Clean Water Act, ADEC must review and revise the state water quality regulations every three years. In July 1992, ADEC published proposed revisions that represent a sincere effort to balance environmental and economic concerns.

Environmental groups have launched a vigorous campaign claiming that ADEC is dumping Alaska's clean water standards down the drain. ADEC denies that its proposed revisions will reduce water quality or lead to reductions in fish populations.

It is critical that ADEC receives a strong public response to counter the environmental campaign. The deadline for public comments is September 30, 1992.

Written comments should be addressed to:
David Sturdevant, Water Quality Management
Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, AK 99801-1795
Fax: 465-5274

Important points to consider using in your comments:

- *The standards should provide adequate environmental protection without unreasonably impairing the domestic, municipal, commercial and industrial use of the waters.*

- *New regulations should be based upon good science that confirms the need for changes and the value of the regulations.*

- *Evolving standards must be achievable and not absolute.*

- *ADEC should take into account the economics of world markets, new technology, other environmental tradeoffs or a company's ability to afford or finance regulatory demands.*

- *The standards should reflect natural water conditions found throughout the state and not be set at limits so restrictive as to exceed native water quality.*

A public hearing will be held in major communities via teleconference on **Friday, September 25, 1992** from 1:00 to 7:00 p.m. Anchorage: 3111 C Street, Suite #150; Juneau: Capitol Bldg., Room 205; Fairbanks: 119 N. Cushman, Room 101; Ketchikan: 352 Front Street; Sitka: 210 Lake Street. A teleconference will be held earlier the same day, from 9-12, in the following communities: Barrow: Court Bldg.; Bethel: 301 Willow Street; Glennallen: Community Library; Homer: 126 W. Pioneer, Room 4; Soldotna: 34824 Kalifonsky Beach Rd; Kodiak: Kodiak Plaza Bldg.; Nome: State Bldg., Front Street; Valdez: Court Building, Room 13

Honorable Cliff Davidson
House Resource Committee
3111 C. St.
Anchorage, AK
99503

Oct 26, 1992

Dear Mr. Davidson

We feel it is urgent to express our concern about proposed changes to the Clean Water Standards of Alaska.

The effects of lower standards would be far reaching & alarming. Most immediate is the danger to the health of the people of Alaska who consume far more seafood than the national average of 51bs per year.

Another detriment would be the loss damage to the fishing industry which would be inevitable as consumers found the Alaskan seafood industry no longer provided a pure product of high quality.

A long term problem would be that the deterioration of the water quality would cause a loss of revenue for the state. Our water will some day be more in demand than our oil. Governor Hickel is already

researching ways to market this resource. If it is not managed to maintain its pristine quality the opportunity will be lost.

So much of Alaska's future depends on the careful management of our water quality; the health + variety of marine life which spurs tourism, the high quality of our seafood products, the health of Alaskans who consume so much seafood + the future economic resource of pure water. We urge you to do all in your power to protect our water quality at or above national EPA standards.

Sincerely,
Sharon M Hunter
Brad L Hunter

PO Box 1603
Petersburg AK
99833

Received Nov 2-, 1992

Dear Mr. Davidson;

I'm writing to protest D.E.C.'s proposed water pollution standards. Lowering the standards to benefit industry over human health seems rather absurd; a return to the dark ages of the industrial revolution.

Increasing the allowable amount of cancer causing compounds dumped into our state waters sounds like something happening in a 3rd. world country. Areas where the health of the people takes a backseat to economics.

I don't believe that we're suffering from such a poor standard of living that the population as a whole has to suffer for the inability of private business to meet nationwide acceptable goals.

Please, I don't want my kids, nor anyone else's kids eaten up by

cancer because they lived too close to a pulp mill or ate one too many fish.

Look to the Great Lakes for a sad story on dioxins, pulp mills + fish.

Please pressure DEC to maintain EPA levels on discharges.

Thank You,

Mike Reitz
Box 1441
Petersburg, Ak
99833

Alaska State Legislature

Please enter into the record my testimony to the House Resources
committee name

committee on Water Quality Regs, dated 10-3-92.
bill/subject

1- I oppose the concept of mixing zones, especially for marine waters

2. I resent imposition of biased approach to establishment of risk factors for dioxin

3. ADEC should withdraw this proposal and go back to the public with better information and full participation of public.

4. Lastly - based on past observations here in Sitka - without support by the administration for support of enforcement the content of regulations makes little difference. Criteria

Signed: Robert J Ellis
Testifier

Representing (Optional)

Box 2966, Sitka
Address

Phone No.

9/86 Legislative Information Office

4- cont. The efforts of the legislature to protect the public is easily thwarted by poor support by commissioners We need public right to sue the commissioners to help enforce these regulations

End

Box 344, Talkeetna, AK 99676

Walter Hickel
Box 110001
Juneau, AK 99811-0001

WALTER HICKEE, YOU HAVE VIOLATED THE PUBLIC TRUST WITH YOUR POSITION ON DIOXIN HEALTH RISK.

IT IS DISGUSTING THAT YOU RISK OUR HEALTH AND TH E HEALTH OF OUR FISH IN ORDER TO INCREASE INDUSTRY PROFIT.

WE DEMAND THE RESIGNATION OF THE DEC COMMISSIONER AND THAT YOU WITHDRAW YOUR DIOXIN DEATH RISK.

My family eat alot of fish; more than the national average and certainly more than the state average that DEC pseudo science states.

We make our living in commercial fishing and have invested heavily in it. Our community's economy is dependent on healthy sport fish populations.

All this is at risk. Your dioxin death wish has threatened our health, our way to make a living, and the multi-million dollar economy of Talkeetna.

IT IS A MORAL OUTRAGE.

Denis Ransey
Denis Ransey

Becky Long
Becky Long

cc: Environmental Protection Agency (Seattle, Washington)
Mat Su state legislative delegation
Rep. Cliff Davidson, Chair of House Resources
Bering Sea Fisherman Association
Yukon River Drainage Fisheries Association.

Cliff Davidson,
Thanks for holding a House Resources hearing on this. I hope you keep on pursuing this. One whiff of scandal in the lower 48 that AK. fish are dioxin contaminated will hurt us badly.

BL