

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF WATER DIRECTOR'S OFFICE

FRANK H. MURKOWSKI, GOVERNOR

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August 14, 2006

Michael F. Gearheard, Director
Office of Water and Watersheds
US Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

RE: Revisions to Alaska Water Quality Standards for mixing zones

Dear Mr. Gearheard:

The Department of Environmental Conservation (DEC) adopted a revision to Alaska's Water Quality Standards in 18 AAC 70 regarding mixing zones regulations and is submitting the change to the Environmental Protection Agency (EPA) for review. The final mixing zone regulation includes revisions that

- expand the prohibition on mixing zones in spawning areas to include lakes;
- create exemptions to the prohibition on mixing zones in non-salmon spawning habitat;
- allow an exemption to the prohibition for mixing zones that were previously authorized in areas where fish were not spawning;
- reorganize the mixing zone regulation to improve clarity and reduce redundancy;
- simplify some technical provisions including ones dealing with risk assessment, flow calculations, and mixing zone models;
- update a reference to federal technology-based effluent limitations;
- include a new definition for shellfish; and
- provide for consideration of measures that would mitigate the potential adverse effects of mixing zones on aquatic resources.

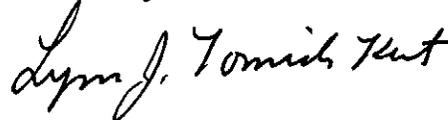
The revised regulation was signed by Commissioner Kurt Fredriksson on February 17, 2006 and filed by Lieutenant Governor Leman on February 21, 2006. The requirements under this regulation went into effect for state purposes on March 23, 2006.

Please find enclosed:

1. a copy of the final regulation in 18 AAC 70.240;
2. the adoption order signed by Commissioner Fredriksson and Lieutenant Governor Leman;
3. the February 21, 2006 memo from the Alaska Department of Law certifying the regulation;
4. DEC response to EPA comments on the 10-17-06 proposed regulations;
5. Commissioner Fredriksson's letter dated January 12, 2006 explaining the new regulations; and
6. the draft mixing zone revisions guidance.

If you have any questions please contact me or Nancy Sonafrank at (907) 451-2726.

Sincerely,



Lynn J. Tomich Kent
Director

Enclosures

cc:

(w/enc): Janine Jennings, EPA R10/Seattle
Lisa McGuire, EPA R10/Seattle

[w/out enc]: Dan Easton, DEC Deputy Commissioner
Nancy Sonafrank, DEC Water/Fairbanks

18 AAC 70.240 is repealed and readopted to read:

18 AAC 70.240. Mixing zones. (a) Upon application, the department may authorize in a discharge permit or certification, a mixing zone or multiple mixing zones in which the water quality criteria and any limit set under this chapter may be exceeded. The applicant shall provide to the department all available evidence reasonably necessary to demonstrate that a mixing zone will comply with this section. The department will approve, approve with conditions, or deny a mixing zone application.

(b) In determining whether to authorize a mixing zone under this section, the department will consider

(1) the characteristics of the receiving water, including biological, chemical, and physical characteristics such as volume, flow rate, and flushing and mixing characteristics;

(2) the characteristics of the effluent, including volume, flow rate, dispersion, and quality after treatment;

(3) the effects, if any, including cumulative effects of multiple discharges and diffuse, nonpoint source inputs, that the discharge will have on the uses of the receiving water;

(4) any additional measures that would mitigate potential adverse effects to the aquatic resources present; and

(5) any other factors the department finds must be considered to determine whether a mixing zone will comply with this section.

(c) The department will approve a mixing zone, as proposed or with conditions, only if the department finds that available evidence reasonably demonstrates that

(1) an effluent or substance will be treated to remove, reduce, and disperse

pollutants, using methods that the department finds to be the most effective, technologically and economically feasible, and at a minimum consistent with statutory and regulatory treatment requirements including

(A) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 40 C.F.R. 125.3, as revised as of July 1, 2005 and adopted by reference;

(B) minimum treatment standards in 18 AAC 72.050; and

(C) any treatment requirement imposed under another state statute or regulation that is more stringent than a requirement of this chapter;

(2) designated and existing uses of the waterbody as a whole will be maintained and protected;

(3) the overall biological integrity of the waterbody will not be impaired; and

(4) the mixing zone will not

(A) result in an acute or chronic toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone;

(B) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation;

(C) preclude or limit established processing activities or established commercial, sport, personal-use, or subsistence fish and shellfish harvesting;

(D) result in a reduction in fish or shellfish population levels;

(E) result in permanent or irreparable displacement of indigenous organisms;

(F) adversely affect threatened or endangered species except as authorized under 16 U.S.C. 1531 - 1544 (Endangered Species Act); or

(G) form a barrier to migratory species or fish passage.

(d) The department will approve a mixing zone, as proposed or with conditions, only if the department finds that available evidence reasonably demonstrates that within the mixing zone the pollutants discharged will not

(1) bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota to significantly adverse levels, based on consideration of bioaccumulation and bioconcentration factors, toxicity, and exposure;

(2) present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the department and consistent with 18 AAC 70.025;

(3) settle to form objectionable deposits, except as authorized under 18 AAC 70.210;

(4) produce floating debris, oil, scum and other material in concentrations that form nuisances;

(5) result in undesirable or nuisance aquatic life;

(6) produce objectionable color, taste, or odor in aquatic resources harvested from the area for human consumption;

(7) cause lethality to passing organisms; or

(8) exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods

approved by the department.

(e) In lakes, streams, rivers, or other flowing fresh waters, a mixing zone will not be

(1) authorized in a spawning area of any of the five species of anadromous

Pacific salmon found in the state; or

(2) allowed to adversely affect the present and future capability of an area to

support spawning, incubation, or rearing of any of the five species of anadromous Pacific salmon found in the state.

(f) In lakes, streams, rivers, or other flowing fresh waters, except as provided in (g) of this section, a mixing zone will not be authorized in a spawning area for

(1) Arctic grayling;

(2) northern pike;

(3) lake trout;

(4) brook trout;

(5) sheefish;

(6) burbot;

(7) landlocked coho salmon, chinook salmon, or sockeye salmon; or

(8) anadromous or resident rainbow trout, Arctic char, Dolly Varden, whitefish,

or cutthroat trout.

(g) The department may authorize a mixing zone in a spawning area of a lake, stream, river, or other flowing fresh water for the species listed in (f) of this section if

(1) after consultation with the Department of Natural Resources, or with the

Department of Fish and Game if the spawning area is within a special area, the department finds

that the applicant has demonstrated that the discharge

(A) does not contain pollutants at concentrations that exceed the criteria for growth and propagation of fish, shellfish, other aquatic life, and wildlife established in 18 AAC 70.020(b)(1) - (12); and

(B) will not adversely affect the capability of the area to support future spawning, incubation, and rearing activities;

(2) the applicant has submitted to the department a mitigation plan approved by the Department of Fish and Game under 5 AAC 95.900 if the spawning area is within a special area;

(3) the applicant has submitted to the department a mitigation plan approved by the Department of Natural Resources under AS 41.14, if the spawning area is within waters included in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; the department will incorporate the mitigation plan as part of the discharge authorization; or

(4) the applicant has submitted to the department a mitigation plan approved by the department, after consultation with the Department of Natural Resources, if the spawning area is not within waters described in (2) or (3) of this subsection; the mitigation plan must use measures described in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; the department will incorporate the mitigation plan as part of the discharge authorization.

(h) In a mixing zone authorization under (g) of this section, the department may require the applicant to monitor effluent, ambient water quality, and biological conditions to determine

whether unanticipated adverse effects on spawning, incubation, and rearing of species identified in (f) of this section are occurring.

(i) The provisions of (e), (f), and (g) of this section do not apply to the renewal of a mixing zone authorization where spawning was not occurring at the time of the initial authorization, but successful spawning, incubation, and rearing has occurred within the mixing zone after the initial authorization of that mixing zone.

(j) When determining whether to authorize a mixing zone under (e), (f), or (g) of this section, the department will make that determination

(1) in conformance with the determination of the Department of Fish and Game, acting under AS 16.20, of the location and time of a spawning area within a special area;

(2) in conformance with the determination of the Department of Natural Resources, acting under AS 41.14, of the location and time of a spawning area within waters included in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; or

(3) after consultation with the Department of Natural Resources, as to what the Department of Natural Resources considers the location and time of a spawning area not within waters described in (1) or (2) of this subsection.

(k) The department will approve a mixing zone, as proposed or with conditions, only if it finds that the mixing zone is as small as practicable and will comply with the following size restrictions, unless the department finds that evidence is sufficient to reasonably demonstrate that these size restrictions can be safely increased:

(1) for estuarine and marine waters, measured at mean lower low water,

(A) the cumulative linear length of all mixing zones intersected on any given cross section of an estuary, inlet, cove, channel, or other marine water may not exceed 10 percent of the total length of that cross section; and

(B) the total horizontal area allocated to all mixing zones at any depth may not exceed 10 percent of the surface area;

(2) for lakes, the total horizontal area allocated to all mixing zones at any depth may not exceed 10 percent of the lake's surface area;

(3) for streams, rivers, or other flowing fresh waters, the length of a mixing zone may not extend beyond the computed point of complete mixing, as determined using a standard river flow mixing model or other methods accepted by the department;

(4) for streams, rivers, or other flowing fresh waters, the length of a mixing zone may not extend downstream beyond the location where the department determines that a public health hazard reasonably could be expected to occur.

(I) For streams, rivers, or other flowing fresh waters, in calculating the maximum pollutant discharge limitation, the volume of flow available for dilution must be determined using

(1) the actual flow data collected concurrent with the discharge; or

(2) for conventional and nontoxic substances, the 10-year, 7-day low flow (7Q10) as the criteria design flow; for the protection of aquatic life, the 10-year, 7-day low flow (7Q10) as the chronic criteria design flow and the 10-year, 1-day low flow (1Q10) as the acute criteria design flow; and for the protection of human health, the 5-year, 30-day low flow (30Q5) as the noncarcinogenic criteria design flow and the harmonic mean flow as the carcinogenic criteria

design flow; these low flows must be calculated using methods approved by the department.

(m) If the department finds that available evidence reasonably demonstrates that a mixing zone authorized by the department has had or is having a significant unforeseen adverse environmental effect, the department will terminate, modify, or deny renewal of the permit or certification authorizing the mixing zone.

(n) When consulting with an agency under (g) or (j) of this section, the department will give appropriate weight to any information received from the agency, considering the agency's expertise.

(o) For purposes of this section, the five species of anadromous Pacific salmon found in the state are chinook salmon, coho salmon, sockeye salmon, pink salmon, and chum salmon.

(p) In this section, "special area" means a state game refuge, a state game sanctuary, or a state fish and game critical habitat area, established under AS 16.20. (Eff. 11/1/97, Register 143; am __/__/__, Register __)

Authority:	AS 46.03.010	AS 46.03.080	AS 46.03.110
	AS 46.03.020	[AS 46.03.090]	AS 46.03.710
	AS 46.03.050	AS 46.03.100	AS 46.03.720
	AS 46.03.070		

18 AAC 70.245 is repealed:

18 AAC 70.245. Mixing zones: appropriateness and size determination. Repealed.

(Eff. 11/1/97, Register 143; repealed __/__/__, Register __)

Register __, ____ 2006 ENVIRONMENTAL CONSERVATION

18 AAC 70.250 is repealed:

18 AAC 70.250. Mixing zones: general conditions. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.255 is repealed:

18 AAC 70.255. Mixing zones: in-zone quality and size specifications. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.260 is repealed:

18 AAC 70.260. Mixing zones: application requirements. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.270 is repealed:

18 AAC 70.270. Mixing zones: termination, modification, or denial of renewal. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.990(2) is amended to read:

(2) "**anadromous,**" with respect to fish, ["ANADROMOUS FISH"] has the meaning given **in the definition of "anadromous fish"** [THAT TERM] in the definitions section of the **Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes** [CATALOG OF WATERS IMPORTANT FOR SPAWNING, REARING, OR MIGRATION OF ANADROMOUS FISHES], adopted by reference in 11 AAC 195.010;

Register ____, _____ 2006 ENVIRONMENTAL CONSERVATION

18 AAC 70.990(30) is repealed:

(30) repealed ___/___/___;

18 AAC 70.990 is amended by adding a new paragraph to read:

(72) "shellfish" means a species of crustacean, mollusk, or other aquatic

invertebrate with a shell or shell-like exoskeleton, in any stage of its life cycle. (Eff. 11/1/97,

Register 143; am 4/29/99, Register 150; am 6/22/2003, Register 166; am ___/___/___, Register

___)

Authority:	AS 46.03.010	AS 46.03.080	AS 46.03.110
	AS 46.03.020	[AS 46.03.090]	AS 46.03.710
	AS 46.03.050	AS 46.03.100	AS 46.03.720
	AS 46.03.070		

ORDER ADOPTING CHANGES TO REGULATIONS OF
THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

The attached ten pages of regulations, dealing with water quality standards is hereby adopted and certified to be a correct copy of the regulation changes that the Department of Environmental Conservation adopts under the authority of AS 46.03.020, 46.03.050, 46.03.070, and 46.03.080, and after compliance with the Administrative Procedure Act (AS 44.62), specifically including notice under AS 44.62.190 and 44.62.200 and opportunity for public comment under AS 44.62.210.

This action is not expected to require an increased appropriation.

In considering public comments, the Department of Environmental Conservation paid special attention to the cost to private persons of the regulatory action being taken. The Department of Environmental Conservation also gave special attention to alternate practical methods in this regulatory action, as required by AS 46.03.024.

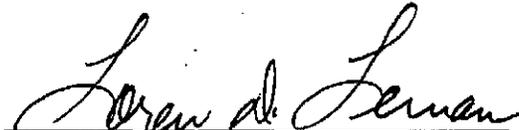
The regulation changes adopted under this order take effect on the 30th day after they have been filed by the lieutenant governor, as provided in AS 44.62.180.

DATE: February 17, 2006
Juneau, Alaska


Kurt Fredriksson, Commissioner
Department of Environmental Conservation

FILING CERTIFICATION

I, Loren Leman, Lieutenant Governor for the State of Alaska, certify that on February 21
2006, at 7:34 p.m., I filed the attached regulations according to the provisions of AS 44.62.040 -
44.62.120.


Loren Leman, Lieutenant Governor

Effective: March 23, 2006

Register: 177 April

LOREN LEMAN
LIEUTENANT GOVERNOR
LT_GOVERNOR@GOV.STATE.AK.US



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**STATE OF ALASKA
OFFICE OF THE LIEUTENANT GOVERNOR
JUNEAU**

MEMORANDUM

TO: Gary Mendivil
Department of Environmental Conservation

DATE: February 22, 2006

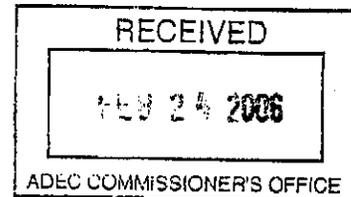
FROM: Lauren Yocom
Administrative Code Coordinator

TELEPHONE: (907) 465-4082

SUBJECT: Permanent Filing of Regulation(s)

RE: **Water Quality and Mixing Zones**
18 AAC 70.240 - 18 AAC 70.270; 18 AAC 70.990

Regulation signed: 2.21.2006
Effective Date: 3.23.2006
Attorney General File: 993-06-0084
Register printed in: 177 April



Attachments

cc: B.J. Jordan Department of Law
Administrative Regulation Review Committee

MEMORANDUM

State of Alaska Department of Law

TO: Hon. Kurt Fredriksson
Commissioner

DATE: February 21, 2006

Department of Environmental Conservation FILE NO.: 993-06-0084

TELEPHONE NO.: 465-3600

FROM: Steven C. Weaver 
Assistant Attorney General
Legislation/Regulations Section--Juneau

SUBJECT: Regulations re: water quality
and mixing zones (18 AAC
70.240 - 18 AAC 70.270;
18 AAC 70.990)

Under AS 44.62.060, we have reviewed the attached regulations changes by the Department of Environmental Conservation, and approve the changes for filing by the lieutenant governor. I have reviewed this project under a specific delegation dated February 17, 2006 from the Regulations Attorney. A duplicate original of this memorandum is being furnished to the lieutenant governor, along with the 10 pages of regulations and the related documents.

You might wish to contact the lieutenant governor's office to confirm the filing date and effective date of the attached regulation changes.

The October 21, 2005 public notice and the February 17, 2006 adoption order both state that this action is not expected to require an increased appropriation. Therefore, a fiscal note under AS 44.62.195 is not required.

SCW

cc w/enc: Gary Mendivil, Regulations Contact
Department of Environmental Conservation

Dan Easton, Deputy Commissioner
Department of Environmental Conservation

Lynn Tomich Kent, Director
Division of Water
Department of Environmental Conservation

Nancy B. Sonafrank
Division of Water
Department of Environmental Conservation

Cameron M. Leonard
Assistant Attorney General
Natural Resources Section--Fairbanks

18 AAC 70.240 is repealed and readopted to read:

18 AAC 70.240. Mixing zones. (a) Upon application, the department may authorize in a discharge permit or certification, a mixing zone or multiple mixing zones in which the water quality criteria and any limit set under this chapter may be exceeded. The applicant shall provide to the department all available evidence reasonably necessary to demonstrate that a mixing zone will comply with this section. The department will approve, approve with conditions, or deny a mixing zone application.

(b) In determining whether to authorize a mixing zone under this section, the department will consider

(1) the characteristics of the receiving water, including biological, chemical, and physical characteristics such as volume, flow rate, and flushing and mixing characteristics;

(2) the characteristics of the effluent, including volume, flow rate, dispersion, and quality after treatment;

(3) the effects, if any, including cumulative effects of multiple discharges and diffuse, nonpoint source inputs, that the discharge will have on the uses of the receiving water;

(4) any additional measures that would mitigate potential adverse effects to the aquatic resources present; and

(5) any other factors the department finds must be considered to determine whether a mixing zone will comply with this section.

(c) The department will approve a mixing zone, as proposed or with conditions, only if the department finds that available evidence reasonably demonstrates that

(1) an effluent or substance will be treated to remove, reduce, and disperse

pollutants, using methods that the department finds to be the most effective, technologically and economically feasible, and at a minimum consistent with statutory and regulatory treatment requirements including

(A) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 40 C.F.R. 125.3, as revised as of July 1, 2005 and adopted by reference;

(B) minimum treatment standards in 18 AAC 72.050; and

(C) any treatment requirement imposed under another state statute or regulation that is more stringent than a requirement of this chapter;

(2) designated and existing uses of the waterbody as a whole will be maintained and protected;

(3) the overall biological integrity of the waterbody will not be impaired; and

(4) the mixing zone will not

(A) result in an acute or chronic toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone;

(B) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation;

(C) preclude or limit established processing activities or established commercial, sport, personal-use, or subsistence fish and shellfish harvesting;

(D) result in a reduction in fish or shellfish population levels;

(E) result in permanent or irreparable displacement of indigenous organisms;

(F) adversely affect threatened or endangered species except as authorized under 16 U.S.C. 1531 - 1544 (Endangered Species Act); or

(G) form a barrier to migratory species or fish passage.

(d) The department will approve a mixing zone, as proposed or with conditions, only if the department finds that available evidence reasonably demonstrates that within the mixing zone the pollutants discharged will not

(1) bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota to significantly adverse levels, based on consideration of bioaccumulation and bioconcentration factors, toxicity, and exposure;

(2) present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the department and consistent with 18 AAC 70.025;

(3) settle to form objectionable deposits, except as authorized under 18 AAC 70.210;

(4) produce floating debris, oil, scum and other material in concentrations that form nuisances;

(5) result in undesirable or nuisance aquatic life;

(6) produce objectionable color, taste, or odor in aquatic resources harvested from the area for human consumption;

(7) cause lethality to passing organisms; or

(8) exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods

approved by the department.

(e) In lakes, streams, rivers, or other flowing fresh waters, a mixing zone will not be

(1) authorized in a spawning area of any of the five species of anadromous Pacific salmon found in the state; or

(2) allowed to adversely affect the present and future capability of an area to support spawning, incubation, or rearing of any of the five species of anadromous Pacific salmon found in the state.

(f) In lakes, streams, rivers, or other flowing fresh waters, except as provided in (g) of this section, a mixing zone will not be authorized in a spawning area for

(1) Arctic grayling;

(2) northern pike;

(3) lake trout;

(4) brook trout;

(5) sheefish;

(6) burbot;

(7) landlocked coho salmon, chinook salmon, or sockeye salmon; or

(8) anadromous or resident rainbow trout, Arctic char, Dolly Varden, whitefish, or cutthroat trout.

(g) The department may authorize a mixing zone in a spawning area of a lake, stream, river, or other flowing fresh water for the species listed in (f) of this section if

(1) after consultation with the Department of Natural Resources, or with the Department of Fish and Game if the spawning area is within a special area, the department finds

that the applicant has demonstrated that the discharge

(A) does not contain pollutants at concentrations that exceed the criteria for growth and propagation of fish, shellfish, other aquatic life, and wildlife established in 18 AAC 70.020(b)(1) - (12); and

(B) will not adversely affect the capability of the area to support future spawning, incubation, and rearing activities;

(2) the applicant has submitted to the department a mitigation plan approved by the Department of Fish and Game under 5 AAC 95.900 if the spawning area is within a special area;

(3) the applicant has submitted to the department a mitigation plan approved by the Department of Natural Resources under AS 41.14, if the spawning area is within waters included in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; the department will incorporate the mitigation plan as part of the discharge authorization; or

(4) the applicant has submitted to the department a mitigation plan approved by the department, after consultation with the Department of Natural Resources, if the spawning area is not within waters described in (2) or (3) of this subsection; the mitigation plan must use measures described in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; the department will incorporate the mitigation plan as part of the discharge authorization.

(h) In a mixing zone authorization under (g) of this section, the department may require the applicant to monitor effluent, ambient water quality, and biological conditions to determine

whether unanticipated adverse effects on spawning, incubation, and rearing of species identified in (f) of this section are occurring.

(i) The provisions of (e), (f), and (g) of this section do not apply to the renewal of a mixing zone authorization where spawning was not occurring at the time of the initial authorization, but successful spawning, incubation, and rearing has occurred within the mixing zone after the initial authorization of that mixing zone.

(j) When determining whether to authorize a mixing zone under (e), (f), or (g) of this section, the department will make that determination

(1) in conformance with the determination of the Department of Fish and Game, acting under AS 16.20, of the location and time of a spawning area within a special area;

(2) in conformance with the determination of the Department of Natural Resources, acting under AS 41.14, of the location and time of a spawning area within waters included in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, adopted by reference in 11 AAC 195.010; or

(3) after consultation with the Department of Natural Resources, as to what the Department of Natural Resources considers the location and time of a spawning area not within waters described in (1) or (2) of this subsection.

(k) The department will approve a mixing zone, as proposed or with conditions, only if it finds that the mixing zone is as small as practicable and will comply with the following size restrictions, unless the department finds that evidence is sufficient to reasonably demonstrate that these size restrictions can be safely increased:

(1) for estuarine and marine waters, measured at mean lower low water,

(A) the cumulative linear length of all mixing zones intersected on any given cross section of an estuary, inlet, cove, channel, or other marine water may not exceed 10 percent of the total length of that cross section; and

(B) the total horizontal area allocated to all mixing zones at any depth may not exceed 10 percent of the surface area;

(2) for lakes, the total horizontal area allocated to all mixing zones at any depth may not exceed 10 percent of the lake's surface area;

(3) for streams, rivers, or other flowing fresh waters, the length of a mixing zone may not extend beyond the computed point of complete mixing, as determined using a standard river flow mixing model or other methods accepted by the department;

(4) for streams, rivers, or other flowing fresh waters, the length of a mixing zone may not extend downstream beyond the location where the department determines that a public health hazard reasonably could be expected to occur.

(f) For streams, rivers, or other flowing fresh waters, in calculating the maximum pollutant discharge limitation, the volume of flow available for dilution must be determined using

(1) the actual flow data collected concurrent with the discharge; or

(2) for conventional and nontoxic substances, the 10-year, 7-day low flow (7Q10) as the criteria design flow; for the protection of aquatic life, the 10-year, 7-day low flow (7Q10) as the chronic criteria design flow and the 10-year, 1-day low flow (1Q10) as the acute criteria design flow; and for the protection of human health, the 5-year, 30-day low flow (30Q5) as the noncarcinogenic criteria design flow and the harmonic mean flow as the carcinogenic criteria

design flow; these low flows must be calculated using methods approved by the department.

(m) If the department finds that available evidence reasonably demonstrates that a mixing zone authorized by the department has had or is having a significant unforeseen adverse environmental effect, the department will terminate, modify, or deny renewal of the permit or certification authorizing the mixing zone.

(n) When consulting with an agency under (g) or (j) of this section, the department will give appropriate weight to any information received from the agency, considering the agency's expertise.

(o) For purposes of this section, the five species of anadromous Pacific salmon found in the state are chinook salmon, coho salmon, sockeye salmon, pink salmon, and chum salmon.

(p) In this section, "special area" means a state game refuge, a state game sanctuary, or a state fish and game critical habitat area, established under AS 16.20. (Eff. 11/1/97, Register 143; am __/__/__, Register __)

Authority:	AS 46.03.010	AS 46.03.080	AS 46.03.110
	AS 46.03.020	[AS 46.03.090]	AS 46.03.710
	AS 46.03.050	AS 46.03.100	AS 46.03.720
	AS 46.03.070		

18 AAC 70.245 is repealed:

18 AAC 70.245. Mixing zones: appropriateness and size determination. Repealed.

(Eff. 11/1/97, Register 143; repealed __/__/__, Register __)

Register ____, _____ 2006 ENVIRONMENTAL CONSERVATION

18 AAC 70.250 is repealed:

18 AAC 70.250. Mixing zones: general conditions. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.255 is repealed:

18 AAC 70.255. Mixing zones: in-zone quality and size specifications. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.260 is repealed:

18 AAC 70.260. Mixing zones: application requirements. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.270 is repealed:

18 AAC 70.270. Mixing zones: termination, modification, or denial of renewal. Repealed. (Eff. 11/1/97, Register 143; repealed __/__/____, Register ____)

18 AAC 70.990(2) is amended to read:

(2) **"anadromous," with respect to fish,** ["ANADROMOUS FISH"] has the meaning given **in the definition of "anadromous fish"** [THAT TERM] in the definitions section of the **Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes** [CATALOG OF WATERS IMPORTANT FOR SPAWNING, REARING, OR MIGRATION OF ANADROMOUS FISHES], adopted by reference in 11 AAC 195.010;

Register __, ____ 2006 ENVIRONMENTAL CONSERVATION

18 AAC 70.990(30) is repealed:

(30) repealed __/__/____;

18 AAC 70.990 is amended by adding a new paragraph to read:

(72) "shellfish" means a species of crustacean, mollusk, or other aquatic invertebrate with a shell or shell-like exoskeleton, in any stage of its life cycle. (Eff. 11/1/97, Register 143; am 4/29/99, Register 150; am 6/22/2003, Register 166; am __/__/____, Register __)

Authority:	AS 46.03.010	AS 46.03.080	AS 46.03.110
	AS 46.03.020	[AS 46.03.090]	AS 46.03.710
	AS 46.03.050	AS 46.03.100	AS 46.03.720
	AS 46.03.070		

RESPONSE TO EPA COMMENTS ON ALASKA'S OCTOBER 17, 2005 PROPOSED REVISIONS TO MIXING ZONE POLICY

Alaska Department of Environmental Conservation

Comment 1. Protection of designated uses (240(c)(2) and elsewhere)

In the final regulation 18 AAC 70.240(c)(2) was changed to read "designated and existing uses of the waterbody as a whole will be maintained and protected". This provision applies to all mixing zones and provides an overarching protection in addition to the more specific protections in other provisions of the mixing zone regulations.

An explanation of "designated", "existing" and "established" uses has been added to the guidance document.

Comment 2. Clarification of regulatory language in 240(c)(1)

DEC proposed adopting the language suggested by EPA, but upon review by the Department of Law, the final language adopted for this provision was changed to read:

"(1) an effluent or substance will be treated to remove, reduce, and disperse pollutants, using methods that the department finds to be the most effective, technologically and economically feasible, and at a minimum consistent with statutory and regulatory treatment requirements including..."

This provision requires all three conditions be met for wastewater treatment prior to discharge, i.e. treatment must be

- the most effective,
- technologically and economically feasible, and
- at a minimum, consistent with statutory and regulatory treatment requirements.

Comment 3. Implementation of ESA provision at 240(c)(4)(F)

- How will DEC determine "adverse effects" under 240(c)(4)(F)?

The implementation guidance has been amended to include a section explaining that DEC will consider adverse effects in a manner consistent with the Endangered Species Act and applicable federal guidance.

- Will DEC confer with the Services and develop a biological evaluation using BE methods acceptable to the Services, or use other methods?

If the permit or certification involves a federal action agency, DEC will rely on the biological assessment prepared by the action agency to determine compliance with 18 AAC 240(c)(4)(F). If there is no federal action agency, the applicant is responsible for demonstrating compliance with this provision. DEC will also consider any evidence provided by the Services to evaluate adverse effects.

- Will the Services be consulted or asked to concur with DEC's effects? If not, what process will be used to determine whether the requirement at 240(c)(4)(F) has been met?

DEC will consult informally with the Services when there are endangered species present. DEC will consider any comments provided by the Services regarding any proposed permit or certification during the public notice period. If the available evidence indicates there may be an adverse effect, DEC may not authorize a mixing zone unless the applicant has authorization under an ESA section 7 consultation (when there is a federal action agency) or under an ESA section 10 incidental take permit approved by the U.S. Fish and Wildlife Service. DEC can not independently approve any adverse effects to ESA listed species.

- How will compliance with 240(c)(4)(F) be documented in the public record for the State certification of the mixing zone?

Any information provided by the applicant will be available for review during the public notice period. The information provided by the applicant, and comments from the Services or any other credible source submitted during the public comment period will be part of the public record, as well as DEC's response and final decision on the permit.

- If the Services make an adverse effect determination for a proposed mixing zone (as part of an ESA consultation on a draft permit issued by EPA, or as part of EPA and the Services' coordination procedures for oversight of State-issued NPDES permits), would that prohibit the State from authorizing the mixing zone?

DEC can not independently authorize a mixing zone on which the Services and EPA have made an adverse effect determination, which is why the provision was changed to state "unless authorized under the Endangered Species Act". Under the revised provision, the EPA (or other federal action agency) could allow minor incidental take under terms and conditions that result from an ESA consultation. If there is no federal action agency, the applicant would be required to obtain authorization from the Services by an incidental take permit with appropriate terms and conditions that minimize take.

Comment 4. Essential fish habitat

Although there is not specific provision referring to Essential Fish Habitat (EFH) requirements, there are numerous provisions in the revised regulations that address EFH including subsections 240(c)(2); 240(c)(3); 240(c)(4)(A), (C), (D), (E), and (G); 240(d)(1); 240(d)(5); 240(d)(7); and 240(e). New restrictions were adopted in final regulations subsection 240(e) that prohibit mixing zones in spawning areas for any of the five Pacific salmon species, and prohibit adverse effects

in areas that support spawning, incubation or rearing for these species. Note that the five Pacific salmon species are the only EFH listed species in fresh waters.

Comment 5. Tribal resources

The mixing zone regulations include several provisions protecting tribal resources. All water quality standards including the mixing zone regulations protect designated uses including the growth and propagation of fish, shellfish, other aquatic life and wildlife. The antidegradation policy further protects water quality consistent with the social and economic benefit provided by using the water. There is also a specific provision in the mixing zone regulations protecting “established commercial, sport, personal-use, or subsistence fish and shellfish harvesting” (emphasis added) in 18 AAC 70.240(c)(4)(C). The Department of Fish and Game, Subsistence Division has a community profile database which tracks subsistence fish and wildlife harvests in Alaska. Information on the database can be found at <http://www.subsistence.adfg.state.ak.us/geninfo/publctns/cpdb.cfm>. Permit applications require the applicant to provide information on all known uses of the waterbody, and this information is available as part of the public record during the public notice.

The Department is required by statute and regulation to provide public notice of, and opportunity for comment by all Alaskans on all permits and certifications. Mixing zone can only be authorized as part of a permit or certification, so no mixing zones can be authorized by the Department without a public review. A public hearing is held when there is a significant degree of public interest in a draft permit, or when the Department decides that a hearing might clarify issues involved in the permit decision. Public notices are routinely sent to tribal governments and organizations in the affected area. Comments on effects to traditional subsistence resources are considered as necessary to protect designated uses for state waters and to meet all other requirements of the mixing zone policy in 18 AAC 70.240.

Comment 6. Migration and fish passage (240(c)(4)(G))

No substantive changes was intended when the Department revised the mixing zone provision requiring “a zone of passage” into a provision prohibiting “a barrier to migratory species and fish passage”. Mixing zone regulations in other region 10 states also use the term “barrier to fish passage” rather than “zone of passage”. In the mixing zone size limitations of the guidance document a paragraph has been added to clarify that this provision would require continuous zones of passage that meet aquatic life criteria.

Comment 7. Mixing zones for bioaccumulative pollutants (240(d)(1))

Most of the state water quality criteria are based on EPA nationally recommended criteria including human health criteria for fish consumption and aquatic life criteria for the growth and propagation of propagation of fish, shellfish and other aquatic life. The national aquatic life criteria are based on both chronic and acute toxicity data for a wide variety of aquatic species. Bioaccumulative and persistent pollutants could clearly adversely affect the capability of an area

to support future spawning. The final regulation, does not allow substances that can bioaccumulate, bioconcentrate, or persist in sediments, water or biota to significantly adverse levels. Other effects to passing and indigenous organisms are addressed by specific provisions to ensure that adverse effects are avoided outside the mixing zones and inside the zone effects are limited and temporary in nature including sublethal chronic and cumulative effects. Outside the mixing zone both acute and chronic toxic criteria are necessary to protect designated and existing uses.

The spawning area provisions for salmon and non-salmon species in the final regulation requires the department to consider effects on the capability of the area to support future spawning, incubation and rearing.

The guidance section on adverse affects has been modified to refer to the definitions of “persist”, “bioaccumlate” and “bioconcentrate” that have been previously adopted in 18 AAC 70.990. It is unclear why the EPA thinks “ sublethal chronic effects” would not include adverse effects such as inability to migrate or inability to forage for food. “Significant” simply means that the adverse effects must be at an observable and measurable level.

Comment 8. Human health risk – clarification (240(d)(2))

Human consumption of aquatic resources is protected by the provision in both prior and final regulations prohibiting unacceptable risk to human health from carcinogenic mutagenic, teratogenic, or other effects. The final regulation requires that the risk assessment must be “consistent with 18 AAC 70.025” where the carcinogenic risk level is established “based on a lifetime incremental cancer risk level of 1 in 100,000 for exposed individuals.” Acceptable risk levels for noncarcinogens and risk assessment methods are described in guidance which requires permittees to follow guidelines found in EPA’s *Technical Support Document for Water Quality-Based Toxics Control*.

The final regulation was revised to read “unacceptable risk to human health...as determined by risk assessment methods” as suggested in one comment to clarify that risk assessment estimates the risk, not causes it. The guidance document has also been amended as suggested in EPA comments.

Comment 9. Mixing zones in spawning areas (240(f))

The prohibition and limitations on mixing zones in spawning areas were considerably changed in response to public comment. The rationale for the final decision is given by Commissioner Kurt Fredriksson in a separate attachment. A new section was added to the guidance document explaining the implementation of the spawning area provision with a decision tree to illustrate the steps in the process.

Comment 10. Mixing zone size limitations (240(g))

A new section was added to the guidance document explaining the implementation of the “small as practicable” and “safely increased” terms in the mixing zone size provisions.

Comment 11. Mixing zone size limitations in rivers (240(g)(3) and (4))

See response to comment 6 regarding size limitation on mixing zones in rivers and streams resulting from 18 AAC 70.240(c)(4)(G).

Standard mixing zone models for rivers can be used to determine the point of complete mixing. If the distance to complete mixing is long enough to impact the designated and existing uses of the waterbody as a whole, then the mixing zone would violate 18 AAC 70.240(c)(2). In that case, the length of the mixing zone would be decreased, even if it met the length limitation in 18 AAC 70.240(g)(3).

The public health hazard referred to in 18 AAC 70.240(g)(4) is similar to the provision in 18 AAC 70.240(c)(4)(B) prohibiting “a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation”. This provision clarifies that a mixing zone that exceeds human health-based criteria in a river or other waterbody must not be allowed to impact an existing water supply intake or recreation area.

Comment 12. Record for mixing zone determinations.

As new “burden of proof” section has been added to the guidance document based on the factsheet provided during the public notice of the proposed mixing zone regulations.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
OFFICE OF THE COMMISSIONER

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January 12, 2006

Dear Alaskan:

Today I adopted changes to the mixing zone provision of the Alaska water quality standards regulation (enclosed). Thank you for taking the time to review and comment on the draft proposed by the Department of Environmental Conservation (DEC) in October 2005. Your comments and suggested improvements made a difference and are reflected in the adopted regulations.

DEC received hundreds of comments on the draft regulations. Most expressed the need to protect Alaska's salmon resources, the need to rely on the State's habitat biologists for decisions affecting fish spawning areas, and the need for a rational regulatory approach. The basis for my decision on each of these three topics follows.

Protect Alaska's Salmon

The majority of comments stemmed from a fear that the proposed regulations could hurt Alaska's salmon resources by allowing a mixing zone in a spawning area. "Do not remove the current prohibition on mixing zones in salmon spawning areas" was the message I heard loud and clear.

The draft regulations released in October 2005 were written to provide a narrow range of exceptions to the prohibition on mixing zones only when any adverse effects to fish spawning areas would be prevented or mitigated. While I believe the proposal was scientifically sound and consistent with state statute, many commented that the value of Alaska's salmon depends not only on the reality of clean water, but the "perception" of clean water.

There is no question that salmon make a major contribution to Alaska's economy and public wellbeing. Consumer perception that Alaska's salmon are clean, fresh, and healthy is critical. Alaska's salmon-based economy is too important to risk any loss in consumer confidence. The adopted regulations retain the prohibition currently in place for mixing zones in salmon spawning areas (18 AAC 70.240 (e)).

The adopted regulations allow a single, very narrow exception to the prohibition to address situations like that found in Valdez where salmon started spawning in a mixing zone that was authorized in what was previously a non-spawning area. An absolute prohibition on mixing zones in spawning areas prevents DEC from reauthorizing a mixing zone for the community sewage treatment facility because salmon started spawning in the treated effluent after the mixing zone was previously established. Without an approved mixing zone, the City of Valdez is faced with a \$1.5 million project to bypass the ditch where the salmon had started spawning.

Communities like Valdez shouldn't lose their mixing zones because fish began successfully spawning in them. Prohibiting the renewal of authorized mixing zones in such areas would not further the goal of protecting fish and, at least in the Valdez case, could be detrimental to future fish spawning by reducing water flow. For that reason, the adopted regulation allows for renewal of mixing zones in spawning areas when fish start successfully spawning in the mixing zone after it is authorized (18 AAC 70.240(i)).

Rely on Habitat Biologists for Spawning Areas Decisions

Some who commented wanted DEC to rely on state habitat biologists to identify fish spawning areas and to prevent any adverse effects on current or future spawning, incubation, and rearing. Alaska's Anadromous Fish Act (AS 41.14.870) has guided the salmon habitat protection programs for nearly half a century, requiring the State's habitat biologists to identify parts of rivers, streams and lakes that are important to the spawning, rearing, or migration of anadromous fish. The Department of Natural Resources, Office of Habitat Management and Permitting (OHMP), and the Department of Fish and Game (DFG), are authorized by the legislature to approve proposed construction in, or use of, anadromous waters to ensure the proper protection of spawning, rearing and migration (AS 41.14 and AS 16.20). Both agencies have established regulatory mitigation methods to implement these statutory requirements.

It has been standard operating practice for DEC to seek the professional expertise and advice of both OHMP and DFG habitat biologists when evaluating the impact of wastewater discharges on fish habitat. I have codified this long standing practice in the adopted regulations. DEC will defer to the state's habitat biologists on identifying fish spawning areas (18 AAC 70.240 (j)), and approving fish impact mitigation plans (18 AAC 70.240 (g)(2) and (3)).

Rational Regulatory Approach

Some comments supported the draft mixing zone regulations as they provide greater flexibility for permitting responsible development. DEC has a duty to pursue a rational regulatory approach based on clear statutory authority and

sound science. Mixing zones that will not harm the growth and propagation of fish should be permitted, not prohibited.

As I explained previously, based on salmon's unique importance in Alaska law and to Alaskans, I have decided to continue prohibiting mixing zones in salmon spawning areas. The adopted regulation also prohibits mixing zones in spawning areas for specific non-salmon species; however for these species a narrow range of exceptions is allowed. An absolute prohibition on mixing zones in non-salmon spawning areas would unnecessarily restrict responsible development that can demonstrate a discharge will not harm the growth and propagation of fish, or where impacts can be appropriately mitigated.

The first exception allows mixing zones that comply with the scientific standards proven to protect fish and fish spawning. DEC may authorize a mixing zone in a spawning area when the quality of the wastewater discharge complies with the specific water quality criteria for protecting the growth and propagation of fish (18 AAC 70.240 (g)(1)). In other words, a mixing zone can be authorized in a non-salmon spawning area as long as the actual water quality will protect present and future spawning, incubation, and rearing. For example, under this exception, the quality of the water in a mixing zone may be lower than what is required for drinking water purposes, but it must comply with scientifically based standards for growth and propagation of fish.

The second exception relies on the authorities, rules and practices of OHMP and DFG which protect fish from many in-stream activities (e.g., dams, water withdrawal, stream diversion, stream crossings, gravel removal, blasting, etc.) using mitigation methods established in state regulation (5 AAC 95.900, 11 AAC 195.010). Potential mixing zone impacts to the growth and propagation of fish are no different than the impacts that can occur from other in-stream activities subject to the mitigation methods applied by DFG and OHMP. Therefore, I have decided to allow mixing zones in non-salmon fish spawning areas when DFG or OHMP have approved a mitigation plan for the mixing zone pursuant to their regulations.

The October 2005 draft regulations included the seasonal timing of a mixing zone as a possible mitigation measure to prevent adverse impacts to fish. However, both DFG and OHMP evaluate where fish spawn and when spawning fish, eggs or alevins are present to identify fish spawning areas. Since timing is one of the factors considered by DFG and OHMP in assessing and identifying spawning areas, I decided it was unnecessary to duplicate that responsibility in the mixing zone regulations.

In addition to the three major issues of greater public concern described in this letter, there were a number of comments made to DEC on other parts of the mixing zone regulations. The final regulations reflect changes as a result of these comments as well.

Dear Alaskan

4

January 12, 2006

I am confident the adopted mixing zone regulations provide the necessary protections to ensure Alaska's water quality will serve many different uses by current and future Alaskans. I appreciate your input and thank you for sharing your views on these important regulations.

Sincerely,

A handwritten signature in black ink, appearing to read "Kurt Fredriksson". The signature is written in a cursive style with a prominent initial "K".

Kurt Fredriksson
Commissioner

cc: Commissioner McKie Campbell, Department of Fish & Game
Commissioner Mike Menge, Department of Natural Resources

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
PROGRAM GUIDANCE**



Guidance No. W 06-__

Page 1 of 6

June 9, 2006

**IMPLEMENTATION GUIDANCE:
2006 MIXING ZONE REGULATION REVISIONS
DRAFT**

Purpose:

This guidance to Department wastewater discharge staff reflects revisions to regulations for mixing zones in 18 AAC 70.240 as amended through March 23, 2006.

- Burden of Proof:** The mixing zone regulations include numerous conditions that must be met before DEC can authorize a mixing zone. DEC's decision to authorize a mixing zone is based on available evidence provided by the applicant and other credible sources. "Available evidence" is defined 18 AAC 70.990(5) as:
- "All relevant and applicable data and information the applicant has or can obtain, and all relevant and applicable data and information available to the department from other sources; "available evidence" does not include data and information that the collection or preparation of which, in the department's determination, is not practicable."
- 18 AAC 70.240(a) states "The applicant shall provide to the department all available evidence reasonably necessary to demonstrate that a mixing zone will satisfy this section." This clearly places the burden of proof on the applicant to submit a complete application with all the evidence necessary to fulfill the requirements in the regulations before a mixing zone can be authorized. Materials provided by applicants and DEC findings made on the basis of the information provided in the application, will be available for review in the public record for the certification or permit.
- Protection of uses:** There are several provisions in the mixing zone regulations that protect uses of the waterbody, generally or specifically. The uses described usually fall into one or more of the following three types:
- "Designated uses" means those uses specified in 18 AAC 70.020 as protected use classes for each waterbody or segment, regardless of whether those uses are being attained (as per 18 AAC 70.990(19)).
- "Existing uses" means those uses actually attained in a waterbody on or after November 28, 1975 (as per 18 AAC 70.990(24)).
- "Established" uses are not specifically defined in regulations, but are generally understood to be specific uses that pre-existed the mixing zone and are ongoing activities, i.e. these uses are continuing or likely to recur on a periodic basis. An example is the protection for established processing and harvesting activities in 18 AAC 70.240(c)(4)(C).
- Adverse effects:** When determining whether to authorize a mixing zone, the department will consider, among other requirements, any proposed measures to mitigate adverse effects to aquatic resources present as per 18 AAC 70.240(b)(4). Any mitigation measures, along with other mixing zone controls, must maintain and protect the growth and propagation use in the waterbody affected by the mixing zone.
- Consideration of the adverse effects of a pollutant will include any available evidence of sublethal chronic effects and the potential of the pollutant to persist or

bioaccumulate (18 AAC 70.240(d)(1)). For the purposes of this evaluation, the following definitions are found in 18 AAC 70.990:

- “bioaccumulation” means the ability of a substance or chemical to be taken up by an organism either directly from exposure to a contaminated medium or by consumption of food containing the substance or chemical;
- “bioconcentration” means the ability of a substance or chemical to be absorbed from water through gills or epithelial tissue and concentrate in the body of an organism; and
- “persist” means the ability of a substance or chemical not to decay, degrade, transform, volatilize, hydrolyze, or photolyze.

When considering adverse effect to threatened and endangered species as required under 18 AAC 70.240(c)(4)(F), effects should be evaluated in a manner consistent with the Endangered Species Act (U.S.C. 1531-1544) and applicable guidance such as

- *Endangered Species Consultation Handbook*, March 1998, U.S. Fish and Wildlife Service and National Marine Fisheries Service; and
- *Endangered and Threatened Wildlife and Plants: Definition of “Harm”*, 64 Fed. Reg. 60727-60731 (November 8, 1999).

Note that DEC can not independently approve any adverse effect to Endangered Species Act (ESA) listed species under the mixing zone regulations. Under the ESA, any adverse effects allowed as “incidental take” must be approved through either

- ESA section 7 consultation by a federal action agency (e.g. EPA consultation on a NPDES permit); or
- ESA section 10 incidental take permit issued by the U.S. Fish and Wildlife Service.

Human health: 18 AAC 70.240(d)(2) prohibits mixing zones that would present an unacceptable risk to human health. 18 AAC 70.240 requires the applicant to demonstrate that this requirement is met. To determine health risk, the Department may require an applicant to perform a site-specific analysis based on exposure pathways, including exposure duration of affected aquatic organisms in the proposed mixing zone, patterns of fisheries use, and consumption of water, fish, or shellfish in the area. The risk assessment method should follow guidelines found in *Technical Support Document for Water Quality-Based Toxics Control*. 1991. EPA/505/2-90-001.

For carcinogens, an acceptable risk is based on a lifetime incremental cancer risk level of 1 in 100,000 for exposed individuals under 18 AAC 70.025. For non carcinogens, an acceptable risk is based on the reference dose (RfD) obtained from the EPA’s Integrated Risk Information System (IRIS) or other DEC-approved toxicological data source. The RfD is an estimate of the daily exposure to the

human population that is likely to be without appreciable risk of causing deleterious effects during a lifetime.

Fish spawning areas:

Mixing zones that are proposed in spawning areas for species listed in 18 AAC 70.240(e) and .240(f) may be prohibited or have additional requirements such as timing restrictions or mitigation measures. The findings necessary for a decision regarding a mixing zone in a spawning area are diagramed in Attachment A.

The agency with authority to determine the location and time of spawning areas and to approve mitigation plans depends on location of the waterbody as indicated below:

- The Department of Fish and Game has authority over waters in Special Areas listed in AS 16.20;
- The Department of Natural Resources has authority over water included in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*; or
- The Department of Environmental Conservation has authority over all other waters. The department normally defers to local habitat biologists in the Office of Habitat Management and Permitting when determining the location and time of fish spawning areas and the appropriateness of proposed mitigation measures. An approved mitigation plan must be incorporated into the discharge authorization as part of the permit or certification.

Computer models:

Mixing Zone models are tools used to predict how substances mix upon discharge to a receiving water. Department staff primarily use two mixing zone models, CORMIX and PLUMES, however other models, if approved by the department, may be used to determine mixing zone characteristics. The CORMIX and PLUMES models are most accurate for near field dilution determinations, but are also capable of providing estimates of farfield dilution. Both CORMIX and PLUMES provide graphic representation of the plume size and associated dilutions. When using the models for far field determinations, modeling results may not be reliable when a plume reaches a boundary such as a river bank.

Initial mixing/acute zone:

Compliance with 18 AAC 70.240(d)(8) of the Water Quality regulations is assumed if **one** of the following methods is used to limit the size of the zone in which acute aquatic life criteria are exceeded:

1. The initial discharge velocity is 3 m/s or greater; and the mixing zone is no larger in any direction than 50 times the discharge length scale (i.e. the square-root of the cross-sectional area of the largest port).
2. Acute aquatic life criteria are met within a distance from the outfall that is no greater than
 - o 10% of the distance to the boundary of the mixing zone;

- 50 times the discharge length scale; and
 - 5 times the local water depth.
3. A drifting organism reaches the acute mixing zone boundary (i.e. the zone in which aquatic life criteria are exceeded) in 15 minutes or less.
 4. A drifting organism does not receive harmful exposure when evaluated by a valid toxicological analysis approved by the department.

For additional information on how these methods are implemented see *Technical Support Document for Water Quality-Based Toxics Control*. 1991. EPA/505/2-90-001.

**Mixing zone
size limitations:**

18 AAC 70.240(k) requires mixing zone size to be

- as small as practicable; and
- within the size restrictions applicable to the type of waterbody.

“Small as practicable” is meant to limit the size of any mixing zone to only what is necessary after the wastewater discharge meets the treatment requirements of 18 AAC 70.240(c)(1). This size limitation is independent of the type or size of the waterbody and may not be waived.

Other size restrictions in 18 AAC 70.240(k) are based on they type and size of the waterbody. These restrictions are general prescriptions which may be safely exceeded based on site specific information only if the applicant demonstrates that the mixing zone is as small as practicable AND it meet all other mixing zone provisions including the protection of the designated and existing uses of the waterbody as a whole required in 18 AAC 70.240(c)(2).

In calculating mixing zone size in streams river or other flowing fresh waters, the mixing zone may not create a barrier to migratory species or fish passage under 18 AAC 70.240(c)(4)(G). To ensure compliance with this provision, the mixing zone should be sized to provide a continuous zones of passage that meets all applicable aquatic life criteria either outside the mixing zone or within a mixing zone that only exceeds human health criteria (e.g. fecal coliform bacteria).

**Flow
calculations for
streams and
rivers:**

Low flows should be calculated using methods of

- Ashton and Carlson, *Determination of Seasonal, Frequency and Durational Aspects of Streamflow with Regard to Fish Passage Through Roadway Drainage Structures* (1984);
- Carlson, *Seasonal, Frequency and Durational Aspects of Streamflow in Southeast and Coastal Alaska* (1987); or
- Other appropriate regional regression flow model approved by the department.

Actual flow data collected concurrent with the discharge may also be used to monitor compliance with water quality standards under 18 AAC 240(h)(1). For the

purposes of data collection under this section, "concurrent" will be a set time period approved by the Department based on the variability of the specific site conditions. Historic river and effluent flow will initially be used to design a mixing zone with sufficient dilution capacity during critical low-flow periods as designated in 18 AAC 240(h)(2). Concurrent flow data may then be used to monitor compliance with the approved mixing zone boundaries using either of the following two methods:

1. Pollutant concentration levels may be calculated for the mixed effluent and river water at the edge of the mixing zone using concurrent river and effluent data. The calculated concentration must meet water quality standards. Effluent flow and/or quality may be varied at the time of discharge depending on the concurrent river flow volume available for dilution.

The data necessary for this calculation includes the following:

- For conventional pollutants, the volume of effluent discharged daily should be determined. For toxic pollutants, the maximum 2-3 hour flow during a daily discharge cycle should be determined.
 - The effluent should also be sampled for each pollutant to which concurrent flow limits apply. Samples should be taken concurrent with the flow data.
 - The volume of river water available for dilution purposes should be measured concurrent with flow data for the discharge.
 - Either historic data, if sufficient, or concurrent monitoring of the background river water concentration of a pollutant may be used for dilution determinations.
 - Other water quality parameters, such as hardness and pH, may also be necessary to determine compliance with water quality standards.
2. Pollutant concentration levels may be measured by sampling at the downstream edge of a mixing zone to demonstrate compliance with water quality standards. Concurrent in-stream monitoring of flow, pollutants and other relevant water quality parameters should be collected as necessary. To minimize the amount of concurrent data to be collected and analyzed, concurrent limit determinations may be necessary only during low flow periods, with steady-state conditions applying at less critical, high flow periods.

Water rights for mixing zones:

It is a good business practice for a permittee to ensure that other water users do not impact their ability to continue to discharge. DEC permitting staff will advise mixing zone applicants that they should contact DNR to obtain water rights. Water rights are not required to obtain a discharge permit, but they are strongly recommended since sufficient water must be available to comply with the mixing zone permit conditions.

Lynn Kent, Director
Division of Water

Date