FACT SHEET

United States Environmental Protection Agency, Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1214

Proposed issuance of a general National Pollutant Discharge Elimination System (NPDES) permit to discharge pollutants pursuant to the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. for

AQUACULTURE FACILITIES IN IDAHO.

This fact sheet includes (a) the tentative determination of the Environmental Protection Agency (EPA) to issue the general NPDES permit, (b) information on public comment, public hearings and appeal, (c) the description of the industry and its discharges, and (d) other conditions and requirements.

The draft permit was prepared with considerable consultation with Idaho Department of Health and Welfare, Division of Enironmental Quality. This collaborative effort was conducted with the Twin Falls Regional Office in the lead for IDHW-DEQ. The majority of aquaculture facilities are located in the Twin Falls Regional Office proper and are point sources identified in *The Middle Snake Watershed Management Plan, Phase 1 TMDL.* A public meeting was held in Twin Falls on June 19, 1997 to obtain input from the public on key issues. In response to this input, EPA in consultation with IDHW-DEQ has agreed, among other things, to develop a more logical and equitable classification scheme and to reduce the monitoring and data collection requirements.

Persons wishing to comment on the tentative requirements contained in the draft general permit may do so before the expiration date of the public notice. All written comments should be submitted to EPA as described in the public comments section of the attached public notice. Comments directed at specific permit requirements and supported by a basis are appreciated.

After the expiration date of the public notice, the Director, Office of Water, EPA Region 10, will make a final determination with respect to issuance of the general permit. The tentative requirements contained in the draft general permit will become final conditions if no substantive comments are received during the public comment period.

Within 120 days following the service of notice of EPA's final permit decision under 40 CFR § 124.15, any interested person may appeal the Permit in the Federal Court of Appeal that decision in accordance with Section 509(b)(1) of the Clean Water Act. Persons affected by a general permit may not challenge the conditions of the Permit as a right of further EPA proceedings. Instead, they may either challenge the Permit in court or apply for an individual NPDES permit and then request a formal hearing on the issuance and denial of an individual permit.
The draft general NPDES permit and fact sheet are on file and may be inspected and

copied at the above address any time between 8:30 a.m. and 4:00 P.M., Monday through Friday. Copies and other information may be requested by writing to EPA at the above address to the attention of the NPDES Permits Unit, or by calling (800) 424-4EPA.

This material is also available for inspection and copying at the following federal and State offices in Idaho:

U.S. Environmental Protection Agency Region 10
Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706

and,

IDHW, Division of Environmental Quality
Twin Falls Regional Office
601 Pole Line Road, Suite 2
Twin Falls, Idaho 83301

IDHW, Division of Environmental Quality
Boise Regional Office
1445 N. Orchard
Boise, Idaho 83706-2239

IDHW, Division of Environmental Quality
Pocatello Regional Office
224 S. Arthur
Pocatello, Idaho 83204

IDHW, Division of Environmental Quality
Lewiston Regional Office
1118 F St.
Lewiston, Idaho 83501

IDHW, Division of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Pkwy
Coeur d'Alene, Idaho 83814

IDHW, Division of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline
Idaho Falls, Idaho 83402

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1 WHAT FACILITIES, POLLUTANT DISCHARGES AND RECEIVING WATERS ARE COVERED BY THE GENERAL PERMIT

1.1 Facilities covered by the Permit

EPA is proposing to issue a general NPDES permit for aquaculture facilities (see 40 CFR § 122 App. C) and associated fish processing facilities in Idaho. The Permit will authorize discharges from facilities engaged in the growing, containing or holding of fish in ponds, raceways and other similar structures. These facilities must discharge pollutants to surface waters of the United States during at least thirty (30) days per year and meet the following criteria for production or feeding:

- produce 20,000 pounds or more of cold water fish per year or feed 5,000 pounds of food or more in any one calendar month;

- produce more than 100,000 pounds of warm water fish per year; or

The Permit may authorize discharges from facilities which do not meet any of these criteria for production or feeding, provided that the facility is determined by the EPA to be a significant contributor of pollution to waters of the United States. In making such a designation, the EPA will consider the following factors:

- the location and quality of the receiving water;

- the holding, feeding and production capacities of the facility;

- the quantity and nature of the pollutants discharged; and

- other relevant factors, such as total maximum daily load (TMDL) determinations for watersheds and § 401 certified stipulations by the State of Idaho (40 CFR § 122.24).

As of October 1997, there were approximately 100 aquaculture facilities permitted under NPDES to discharge effluents in Idaho, about 80 facilities discharging in the Middle Snake watershed and 25 facilities in other Idaho watersheds. Another 20 plus facilities have applied for permits to discharge.

The Middle Snake River watershed facilities, excluding those discharging to Billingsley Creek, include about 10 facilities producing more than one million pounds of fish annually, about 10 facilities producing between 500,000 and one million pounds, about 30 facilities producing between 100,000 and 500,000 pounds, and about 10 facilities producing between 20,000 and 100,000 pounds. No production data are available for another 10 plus facilities in the watershed.

As for flow through the Middle Snake River watershed facilities, excluding those discharging to Billingsley Creek, eleven facilities utilize more than 100 cubic feet per

second (cfs), six facilities use 40 to 100 cfs, about 15 use between 20 and 40 cfs, and another 30 use less than 20 cfs. No flow data are available for 8 facilities. The aquaculture facilities include both cold water facilities which raise trout, steelhead, salmon and sturgeon and warm water facilities which raise catfish, tilapia and carp. These facilities consist of either a set of ponds or earthen or concrete raceways, in series (each pond flowing into the next pond) or in parallel (each pond flowing separately to the treatment system or discharge point). Facilities are operated on either a batch or continuous basis.

Comparison of Batch and Continuous Aquaculture Facilities

Operation	Batch Facilities	Continuous Facilities
Grading or Classification of fish	No	Yes
Solids Removal	Post Harvest	Frequently, during rearing
Settling Basin	Yes: Full-flow for daily use; Offline for infrequent use during rearing pond cleaning	Yes: Offline
Discharge points	At the full-flow pond or offline settling basin	At the raceways and at the offline settling basin

Discharges from aquaculture operations typically contain organic and inorganic solids, chemicals used in prevention and treatment of disease, and nutrients, all of which could impact water quality in the receiving stream. Solids in the discharge may be either dissolved or particulate. The majority of the solids result from fecal matter and waste food particles, with additional solids introduced by influent water which is passed through the operation. Associated with these solids are nutrients such as phosphorous and nitrogen. Solids and nutrients have the potential to create oxygen deficits in the receiving stream due to the decay of organic solids and the creation of favorable conditions for aquatic plant growth.

Additional information on the nature of the aquaculture industry is provided in the *The Middle Snake River Watershed Management Plan, Phase 1 TMDL, Total Phosphorus* (IDHW-DEQ 1997), *Billingsley Creek TMDL* (IDHW-DEQ 1992), and documents referenced therein.

Several aquaculture facilities have fish processing facilities associated with them which butcher fish for market on-site. Production ranges from hundreds to tens of

thousands of trout, catfish or tilapia per day. Pollutant discharges consist of rinse and wash-down water and entrained blood and gut remnants which are measured in terms of BOD5, TSS, settleable solid residues, oil and grease, nutrients, and pH as well as disinfectants.

One aquaculture facility discharging to the Snake River treats its sewage and domestic wastewater in large septic tanks that serve as primary settling basins. Waste water then continues to a series of aeration ponds for biological treatment and further settling of solids. Wastewater is then treated with chlorine prior to discharge to the receiving water.

1.2 Facilities not authorized by the Permit

The Permit does not authorize discharges from facilities that produce less than 20,000 pounds of cold water fish per year and feed less than 5,000 pounds of food in any one calendar month, or produce less than 100,000 pounds of warm water fish per year (unless such a facility has been designated a significant contributor of pollution by the EPA). The Permit does not authorize discharges from holding facilities used solely for the acclimation of fish prior to release to a water body, or facilities used solely for fee fishing, unless such facility feeds more than 5,000 pounds of food in any one calendar month. The Permit does not authorize discharge from cleaning facilities used by recreational fishermen.

1.3 Discharges covered by the Permit

The following pollutants are covered by the Permit, subject to the limitations and conditions of the Permit and described below:

- Ammonia;
- Biochemical oxygen demand;
- Biological wastes (e.g., dead fish);
- Deleterious materials;
- Fecal coliform and other bacteria;
- Floating, suspended or submerged matter of any kind;
- Nutrients, including phosphorus and nitrogen compounds among others;
- Oil and grease;
- Oxygen-demanding materials;

- pH;
- Residual disinfectants, including total residual chlorine;
- Residual disease control drugs and other chemicals;
- Residual feed and nutritional supplements;
- Sediment;
- Settleable solids;
- Temperature;
- Total suspended solids;
- Toxic substances; and
- Turbidity.

1.4 Discharges not authorized by the Permit

The Permit does not authorize the discharge of any effluents or pollutants which are not expressly authorized in the Permit. Pollutants which specifically are prohibited for discharge include hazardous materials and petroleum hydrocarbons; and the sludge, grit and accumulated solid residues associated with aquaculture and fish processing operation. Visible scum or sheen in the effluent of aquaculture facilities or associated, on-site fish processors is not authorized by the Permit.

1.5 Receiving waters covered by the Permit

The Permit authorizes discharges of specified pollutants to the waters of the United States in the State of Idaho except those excluded from coverage as protected, special, or at-risk water resources as described below.

1.6 Receiving waters not authorized by the Permit

Discharges are not authorized under the Permit to receiving waters which have been identified as protected, special, or at-risk water resources without the submittal of additional information and approval by EPA and IDHW-DEQ, in consultation with appropriate federal, State, tribal and local governments. EPA upholds this position on the basis of the principle of anti-degradation.

Discharges from aquaculture operations typically contain organic and inorganic solids, chemicals used in prevention and treatment of disease, and nutrients, all of which could impact water quality in the receiving stream. Solids and nutrients have

the potential to create oxygen deficits in the receiving stream due to the decay of organic solids and the creation of favorable conditions for aquatic plant growth. Although EPA believes that this general permit meets the State's criteria for the protection of the aquatic life beneficial use, it may not be adequate to prevent degradation of protected, special, or at-risk water resources.

In consideration of the industry's interest in operating and discharging in some of these areas, EPA has made allowance for the submittal of a request for a waiver within the Permit. The applicant's burden of proof for supporting such a request is substantial. Essentially, an applicant for a waiver to discharge in the following excluded areas must establish a compelling need, such as pre-existing permanent siting, for discharge within an excluded area and must demonstrate that the proposed discharge, as limited by the conditions of the general permit, will adequately protect beneficial uses of the receiving water and will not adversely affect any listed threatened and endangered species.

An aquaculture facility and fish processor wishing to apply for authorization to discharge in the "excluded areas" may choose to apply for an individual NPDES permit.

The areas excluded from coverage under the Permit include the following protected, special, or at-risk water resources and water bodies.

1.6.1 Protected water resources and special habitats.

- Waters identified by the U.S. Fish and Wildlife Service or National Marine Fisheries Service in documentation or through consultation as habitat of bull trout, native steelhead, native salmon (spring, summer and fall Chinook and Sockeye), or Water howellia are excluded from coverage by the Permit. These species have been identified as threatened or endangered under the Endangered Species Act and are protected through the application of standards and restrictions which may exceed the conditions and requirements of this Permit.

- Waters within one (1) mile upstream of or within the boundary of an Idaho Wildlife Management Area are excluded from coverage by the Permit.

- Waters within one (1) mile upstream of or within the boundary of a National Park or Preserve. Congressional mandates and Presidential proclamations have provided that federal parks and preserves be maintained to provide the scenic beauty and quality of landscapes in their natural state, to protect environmental integrity and habitat for populations of fish and wildlife, and to provide continued opportunities for wilderness recreational activities [16 U.S.C. § 1 et seq.].

- Waters within one (1) mile upstream of or within the boundary of a National Wildlife Refuge are excluded from coverage by the Permit unless an applicant

has obtained written authorization to discharge aquaculture wastewaters to these receiving waters from the Regional Director of the U.S. Fish and Wildlife Service (USFWS). National Wildlife Refuges are maintained to protect environmental integrity and populations of fish and wildlife and their habitats, as well as to provide the scenic beauty and quality of landscapes in their natural state and opportunities for wilderness recreational activities [16 U.S.C. § 661 et seq.].

- Waters within one (1) mile upstream of or within the boundary of a National Wilderness Area are excluded from coverage by the Permit. National Wilderness Areas are maintained to protect environmental integrity and populations of fish and wildlife and their habitats, as well as to provide the scenic beauty and quality of landscapes in their natural state and opportunities for wilderness recreational activities [16 U.S.C. § 1131 et seq.].

- River segments designated as wild or scenic under the Wild and Scenic Rivers Act [16 U.S.C. § 1271 et seq.] are excluded from coverage under the Permit. Congress has recognized that certain selected rivers possess outstandingly remarkable scenic, recreational, fish and wildlife and other values. Congress has further declared that rivers designated as wild or scenic and their immediate environs shall be protected for the benefit and enjoyment of present and future generations.

- "Special resource waters" listed in *Idaho Water Quality Standards and Wastewater Treatment Requirements* IDAPA 16.01.02) are excluded from coverage by the Permit, unless a TMDL has been established for the receiving water body. Idaho law [IDAPA 16.01.02.056] provides for designation of waters that are of outstanding high quality, unique ecological significance, possessing outstanding recreational or aesthetic qualities, or for which intensive protection of the quality of the water is in paramount interest of the people of Idaho, or intensive protection of the quality of water is necessary to maintain an existing, but jeopardized beneficial use, or the water is a part of the National Wild and Scenic River System or is within a State or National Park or wildlife refuge. Special resource water are provided protection under Idaho law which states that “no new point source can discharge pollutants, and no existing point source can increase its discharge of pollutants above the design capacity of its existing waste treatment facility, to any water designated as a special resource water or to a tributary of, or to the upstream segment of a special resource water: if pollutants significant to the designated beneficial uses can or will result in a reduction of the ambient water quality of the receiving special resource water as measured immediately below the applicable mixing zone.”

- Outstanding Resource Waters " listed in *Idaho Water Quality Standards and Wastewater Treatment Requirements* IDAPA 16.01.02) are excluded from coverage by the Permit, unless a TMDL has been established for the receiving water body. Idaho law [IDAPA 16.01.02.055] provides for designation of waters

by the Idaho legislature after nomination of waters by the public and review of those nominations by the Idaho Board of Health and Welfare. The Board gives special consideration to stream segments "generally recognized as constituting an outstanding national resource...or of exceptional recreational or ecological significance." ORW designations constitute as outstanding national or state resources that require protection from point and nonpoint source activities that may lower water quality (IDAPA 16.01.02.003.70).

1.6.2 At-risk resources and water bodies.

- Streams or rivers within one (1) mile upstream of a drinking water intake are excluded from coverage under the Permit. This exclusion ensures the protection of drinking water sources from contamination or pollution.

- Lakes are excluded from coverage under the Permit, unless a TMDL has been written and approved for the watershed containing the lake. This exclusion protects aquatic habitat in Idaho's predominantly oligotrophic lakes as well as ensures further protection of drinking water sources.

1.6.3 Reservations of Native American Tribes

Receiving waters which are within one (1) mile upstream of or within a reservation of the Coeur d'Alene Tribe, the Nez Perce Tribe, the Shoshone-Bannock Tribe or the Shoshone-Paiute Tribe are excluded from coverage under the Permit in order to provide for appropriate intergovernmental consultations between EPA and a tribe concerning the permitting of any aquaculture facility discharging to these surface waters. EPA believes that the waiver provision can provide a vehicle for permitting such facilities under the general permit should the terms and conditions of the general permit address tribal concerns for water quality and environmental protection. Consultations will occur between EPA and an affected tribe.

1.6.4 Discharges to other states and Canada

Receiving waters which are within Idaho and within one (1) mile upstream of Montana, Wyoming, Utah, Nevada, Oregon, Washington, or British Columbia, Canada, are excluded from coverage under the Permit in order to provide for appropriate intergovernmental consultations between EPA and an affected government concerning the permitting of any aquaculture facility discharging to these surface waters. EPA believes that the waiver provision may provide a vehicle for permitting such facilities under the general permit should the terms and conditions of the general permit address the concerns for water quality and environmental protection of the affected government. Consultations will occur between EPA and an affected government.

1.7 Request for a waiver

An applicant may request a waiver of one or more of the exclusions of receiving waters from discharge in the general permit by submitting a timely and complete request for a waiver. EPA has provided the option to request a waiver to discharge in the excluded areas listed in the general permit in order to provide a mechanism for aquaculture facilities (1) to assume the additional burden-of-proof that their discharges to such excluded areas will not degrade either the water quality or aquatic resources therein and (2) to ensure the completion of any additional due process for approval to discharge therein with the affected federal, state and tribal entities and members of the public. EPA believes that the burden-of-proof of "no degradation or adverse effects" may be met with the submittal of a complete and timely notice of intent to be covered (as described below) and additional information supporting a determination of "no degradation or adverse effects" on water quality standards, water resource management plans, environmental integrity, or species listed as threatened or endangered under the Endangered Species Act. EPA also requires that an applicant for a waiver will provide a justification for its request to discharge in areas excluded from coverage under the general NPDES permit for aquaculture facilities in Idaho.

2 BACKGROUND

2.1 Permit history

The first NPDES permit issued to aquaculture facilities in Idaho became effective in May 1975. A new permit was issued to the facilities in October 1984. The most recent permit to be issued to many aquaculture facilities in Idaho was issued in October 1990. Applications were received in the spring of 1995, prior to expiration of the 1990 permit, and the permits were administratively extended until such time as a revised permit could be issued. Facilities on Billingsley Creek applied for permits in 1989, and a new permit was written which took into account the Total Maximum Daily Load for Billingsley Creek (*Billingsley Creek TMDL,* IDHW-DEQ, 1992). The permit was never issued after the public review.

In July 1996 a request was made of all permitted facilities discharging in the Middle Snake watershed (except those discharging to Billingsley Creek) under authority of section 308 of the Act to obtain supplemental information to their previously submitted applications for permit. Flow and production information for years 1990 through 1995 was requested. This information was used to catagorize the facilities for monitoring requirements

2.2 Effluent limitations of the expired NPDES permits

The permits issued to aquaculture facilities in 1990 contained both technology-based limitations on total suspended solids and settleable solids and water quality-based limitations on floating solids, visible foam and drugs or chemicals in toxic amounts. The permits also required that solids, sludge, filter backwash, and other pollutants removed in the treatment of wastewaters be disposed of in a manner so

as to prevent any pollutant from such materials from entering the surface waters of the United States.

2.3 Monitoring history

Monitoring requirements of an NPDES may be characterized as effluent compliance monitoring, effluent characterization monitoring, effluent toxicity monitoring, and environmental monitoring. Compliance monitoring of effluents involves sampling a wastewater and analyzing for pollutant parameters which are limited within a permit. Characterization monitoring of effluents includes compliance monitoring and may include additional sampling and analysis for pollutant parameters which are not limited within a permit yet. Characterization monitoring is significant in assessing the potential effects of a permitted discharge. Toxicity monitoring involves measuring the toxic effects of an effluent on specified organisms according to nationally approved protocols. Toxicity tests may support compliance monitoring or characterization monitoring. Environmental monitoring is directed at assessing different effects of a pollutant discharge on the receiving water, and may address the water column, the substrate, or the life forms within either the water column or substrate. Monitoring requirements in the 1990 permits and the 1998 general permit are described in the following tables.

Monitoring of Facilities Permitted in 1990 and 1998

Type of Monitoring	1990	1998
Compliance	Required of all	Required of all
Characterization	Required of all facilities, but group study allowed	Required of all
Toxicity, whole effluent	not required	Required of very large facilities
Environmental, sediment	not required	Required of very large facilities

Compliance Monitoring of Raceway, Pond and All Other Effluents
except offline settling basin effluents

Parameter	Sampling Frequency		Type of Samples	
	1990	1998	1990	1998
Flow (cfs)	monthly	various*	24-hr total	24-hr total
Settleable Solids (ml/L)	monthly	various*	Grab	Grab
Total Suspended Solids (mg/L)	monthly	various*	Composite	Composite
Total phosphorus (mg/L)	not required	various*	none	Composite
Temperature (^{o} C)	not required	various*	none	Meter

*Frequency of monitoring varies from weekly to annually, frequency increasing with the increased size of a facility.

Compliance Monitoring of Offline Settling Basin Effluents

Parameter	Sampling Frequency		Type of Samples	
	1990	1998	1990	1998
Flow (cfs)	monthly	various*	24-hr total	24-hr total
Settleable Solids (ml/L)	monthly	various*	Grab	Grab
Total Suspended Solids (mg/L)	monthly	various*	Grab	Grab
Total phosphorus (mg/L)	not required	various*	none	Composite
pH	not required	various*	none	Meter
Temperature (^{o} C)	not required	various*	none	Meter

*Frequency of monitoring varies from weekly to annually, frequency increasing with the increased size of a facility.

Additional Parameters for **Characterization Monitoring of Raceway, Pond and All Other Effluents**
except offline settling basin effluents

Parameter	Sampling Frequency		Type of Samples	
	1990	1998	1990	1998
Flow (cfs)	monthly	various*	24-hr total	24-hr total
Dissolved oxygen (DO, mg/L)	not required	various*	none	Meter
Ammonia (mg/L)	not required	various*	none	Composite
Nitrite-Nitrate (mg/L)	monthly	various*	none	Composite
Total Kjeldahl nitrogen (mg/L)	not required	various*	none	Composite

*Frequency of monitoring varies from weekly to quarterly, frequency increasing with the increased size of a facility.

Additional Parameters for **Characterization Monitoring of Offline Settling Basin Effluents**

Parameter	Sampling Frequency		Type of Samples	
	1990	1998	1990	1998
Flow (cfs)	monthly	various*	24-hr total	24-hr total
Biochemical oxygen demand (BOD5, mg/L)	monthly	various*	Grab	Composite
Dissolved oxygen (DO, mg/L)	not required	various*	none	Meter
Ammonia (mg/L)	not required	various*	none	Composite
Nitrite-Nitrate (mg/L)	monthly	various*	none	Composite
Total Kjeldahl nitrogen (mg/L)	not required	various*	None	Composite

*Frequency of monitoring varies from weekly to quarterly, frequency increasing with the increased size of a facility.

2.4 Pollution reduction history

Aquaculturists have been aware of the effluent pollutant problem at least since the beginning of this century (Boyd, 1991). Pollution reduction by Idaho's aquaculture industry began with the construction of settling ponds in the mid- to late 70's; effluent from raceways and rearing ponds would pass through these ponds slowly, allowing solids to settle before the facility discharge point (Aquaculture Watershed Reduction Plan for the Middle Snake River, 1997; e.g., Brown et al. 1981, Kendra 1991, Westers 1989). By 1984 a number of aquaculture facilities were experimenting with the use of screens to keep resident fish from congregating within 10-20 feet of the effluent weir in each raceway (JRB, 1984). These areas of the raceways became known by industry as quiescent zones. They were effective at settling solids in the raceway, allowing industry to meet the 5.0 mg/L TSS limit on raceway discharges. Settled solids were removed either by mechanical or siphon vacuuming or by draining through opened standpipes in the quiescent zone. Facilities were also experimenting with the effectiveness of solids removal using standpipe siphon hydraulics. Vacuumed or siphoned solids would be sent to off-line settling ponds for further treatment. Improved feed conversions, lower phosphorus feeds, and improvements in availability of phosphorus in feeds are believed to have reduced phosphorus discharges by the industry during the 90's (Aquaculture Watershed Reduction Plan for the Middle Snake River, 1997).

2.5 Total Maximum Daily Load Determination

The general permit includes specific effluent limitations for some of the facilities discharging to the Middle Snake River watershed (the Snake River between Milner dam and King Hill, and its tributaries or canals, including Billingsley Creek). Effluent limitations are based on the Total Maximum Daily Load (TMDL) for the Middle Snake River (IDHW-DEQ 1997) and the TMDL for Billingsley Creek (IDHW-DEQ 1992). DEQ has committed to modifying the TMDL for the Middle Snake River by developing final phosphorus waste load allocations (and effluent limits in consultation with EPA) for all facilities discharging in the watershed listed in the *Middle Snake River Watershed Management Plan*, (IDHW-DEQ 1997). It is EPA's intent to modify the Permit when those allocations are made available, adding and modifying phosphorus limits to the table in Appendix I (Part X.B.1.). Consistent with the TMDL all the listed facilities will be given the balance of the life of this general permit to meet the limits based on the allocations. The total phosphorus concentration limits should assist facilities in meeting their load allocations by year five of the Permit.

The TMDL process is described in §303(d) of the CWA (40 CFR § 130.7), Idaho Code § 39-3611, and IDAPA 16.01.02. A TMDL is a mechanism for determining the assimilative capacity of a water body and allocating that capacity between point and nonpoint pollution sources, and a margin of safety. The assimilative capacity is

the loading of pollutant that a water body can assimilate without causing or contributing to a violation of water quality standards. The assimilative capacity is based on the river flow and the state water quality standards. The allocations for point sources are termed “wasteload allocations” (WLA) and are implemented through NPDES permits. Allocations for nonpoint sources, called “load allocations” (LA) are implemented through the use of best management practices.

TMDL = WLAs + LAs + Margin of Safety.

In the case of phosphorus, there is no numeric criterion in the Idaho water quality standards. However, the standards contain a narrative criterion that states that “surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses” (IDAPA 16.01.02.200.06).

Water quality in large portions of Idaho is degraded as a result of cumulative impacts from altered or reduced stream flows, increased temperature, sediments, loss of riparian cover, and nutrient-laden organic and inorganic material from point and nonpoint sources. These conditions contribute to habitat loss and, in extreme cases, eutrophic conditions. Notable among the 962 water quality-limited segments of Idaho’s streams listed in the 1992 § 303(d) list of impaired water bodies, the Middle Snake River exhibits seasonal eutrophic conditions, such as extensive growths of aquatic vegetation, low aquatic biological species diversity, fluctuating oxygen levels, and increased water temperatures. Solids buildup in the receiving stream below some hatchery discharge points is also noted as a significant problem. Billingsley Creek exhibits similar conditions.

IDHW-DEQ has completed TMDLs for both the Middle Snake River watershed (*Middle Snake River Watershed Management Plan*, IDHW-DEQ 1997) and Billingsley Creek watershed (*Billingsley Creek TMDL*, IDHW-DEQ 1992). These TMDLs provide an important basis for water quality-based limitations of total phosphorus for facilities discharging to these receiving waters.

In the TMDL for the Middle Snake River adopted by the State of Idaho and approved by EPA on April 25, 1997, the State determined that an instream total phosphorus concentration of 0.075 mg/L would result in meeting the narrative criterion for nutrients (IDAPA 16.01.2200.06). The Billingsley Creek TMDL applies EPA Gold Book (Quality Criteria for Water, 1986) criteria for phosphorus (0.10 mg/L) to Billingsley Creek, stating that “the loading capacity (and subsequent TMDL) are based on achieving a maximum level of 0.10 mg/L in the stream” (*Billingsley Creek TMDL,* October 14, 1992).

2.6 University of Idaho Deep Creek Study

A study of six fish farms discharging to Deep Creek, a tributary to the Middle Snake River, was completed in 1993 by the University of Idaho (Deep Creek Fish Farm Effluent Study, Collins and Brannon). Findings of the study indicate that these small fish farms contribute relatively small amounts of solid waste, in the form of fine organic material generated from rearing fish and nutrients, primarily phosphorus. Because of the quality of the source water (Deep Creek), these fish farms had a negative net contribution of suspended solids and nitrite-nitrate levels, but they had a positive net contribution of ammonia and phosphorus in their effluent. The study found that solids and dissolved nutrients can be reduced in settling areas below rearing ponds. These settling areas, especially full flow settling ponds, are desirable for nutrient capturing because of the algae and macrophyte growth.

3 WHAT IS A NOTICE OF INTENT TO BE COVERED BY THE GENERAL PERMIT

Dischargers seeking coverage under a general NPDES permit shall submit to EPA a written notice of intent (NOI) to be covered by the general NPDES permit. In accordance with 40 CFR § 122.28(b)(2)(i), a discharger who fails to submit a timely and complete NOI in accordance with the terms of a general permit is not authorized to discharge under the terms of the Permit unless the Director notifies a discharger that it is covered by this general permit in accordance with 40 CFR § 122.28(b)(2)(vi).

A complete and timely notice of intent to be covered in accordance with general permit requirements, fulfills the requirements for permit applications for purposes of 40 CFR §§ 122.6, 122.21 and 122.26.

The contents of the notice of intent are specified in the general permit and require the submission of the information which EPA Region 10 believes to be necessary for adequate program implementation. The NOI requires information on the legal name and address of the owner and operator of a facility, the facility name and address, the nature and size of the facility, the nature and size of production at the facility, the location, type and amounts of the effluent discharges, the name(s) of receiving stream(s), and information on any federal or state permits pertaining to the use or licensing of water or land for the facility. The NOI may consist of either (1) letter, (2) a form developed for the purpose of NOI, or (3) EPA's permit application forms (EPA Form 3510-1 and 3510-2B) and necessary attachments which address all of the requirements of the Permit for a "complete" submittal of a Notice of Intent. All notices of intent shall be signed by a legal representative of the facility (40 CFR § 122.22).

In accordance with 40 CFR § 122.28(b)(3)(iii), any owner or operator authorized by a general permit may request to be excluded from the coverage of the general permit by applying for an individual NPDES permit. The owner or operator shall submit EPA Application Forms 1, 2B and 2C, with justification supporting its request

for an individual NPDES permit, to EPA Region 10 no later than 60 days after the publication by EPA of this general NPDES permit in the Federal Register. The request shall be processed under 40 CFR § 124. The request will be granted by issuing of an individual permit if the reasons cited by the owner or operator are adequate to support the request and the application is deemed to be timely and complete.

In anticipation that some aquaculture facilities may think it is more advantageous to be covered under an individual NPDES permits, EPA has determined that, at a minimum, the effluent limitations, effluent monitoring, ambient monitoring and other conditions of an individual permit will include all of those in this general permit as required of the largest aquaculture facilities and that all plans and reports will be submitted to EPA and IDHW-DEQ for review and approval.

4 WHAT EFFLUENT LIMITATIONS ARE REQUIRED BY THE GENERAL PERMIT

4.1 General approach to determining effluent limitations

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

In general, EPA first determines which technology-based limits apply to the discharges in accordance with applicable national effluent guidelines and standards (e.g., 40 CFR § 408). EPA further determines which water quality-based limits apply to the discharges based upon its assessment of the effluents discharged and its review of State water quality standards. The permit limits reflect whichever limits (technology-based or water quality-based) are more stringent.

EPA must also include monitoring requirements in the Permit to monitor compliance with effluent limitations. Ambient monitoring may also be required to gather data for future effluent limitations or monitor effluent impacts on receiving water quality and the integrity of the water resource.

The basis for each permit condition is described in more detail below.

4.2 Evaluation of technology-based limitations

Section 301 of the Clean Water Act requires particular categories of industrial dischargers to meet technology-based effluent limitation guidelines. The intent of a technology-based effluent limitation is to require a minimum level of treatment for industrial/municipal point sources based on currently available treatment technologies while allowing a discharger to choose and use any available control technique to meet the limitations.

The Act initially focused on the control of "traditional" pollutants (conventional pollutants and some metals) through the use of Best Practicable Control Technology Currently Available (BPT). Permits issued after July 1, 1977, must include any conditions necessary to ensure that the BPT level of pollution control is achieved. BPT limitations are based on effluent limitation guidelines developed by EPA for specific industries. Where EPA has not yet developed guidelines for a particular industry, permit limitations may be established using Best Professional Judgment (BPJ; 40 CFR §§ 122.43, 122.44 and 125.3).

Section 301(b)(2) of the Act also requires further technology-based controls on effluents. After March 31, 1989, all permits are required by CWA §§ 301(b)(2) and 301(b)(3) to contain effluent limitations for all categories and classes of point sources which: (1) represent Best Conventional Pollutant Control Technology (BCT) and (2) control toxic pollutants and nonconventional pollutants through the use of Best Available Technology Economically Achievable (BAT). BCT effluent limitations apply to conventional pollutants (pH, BOD, oil and grease, suspended solids and fecal coliform). BAT effluent limitations apply to toxic and nonconventional pollutants. Toxic pollutants are those listed in 40 CFR § 401.15. Nonconventional pollutants include all pollutants not included in the toxic and conventional pollutant categories, such as total residual chlorine. In no case may BCT or BAT be less stringent than BPT. Like BPT requirements, BAT and BCT permit conditions may be established using BPJ procedures in the absence of effluent limitations guidelines for a particular industry.

4.2.1 Aquaculture wastes

In 1977 DEQ contracted with Hydroscience Inc and in 1984 EPA contracted with JRB Associates to provide the background information necessary to support the development of technology-based effluent limitations applicable to aquaculture facilities in Idaho (Hydroscience 1978; JRB Associates 1984). These assessments focused on detailed water monitoring in and downstream from hatcheries in the Magic Valley region of the Snake River basin. The studies addressed both effluents and ambient receiving waters. The assessments also considered the age of the facilities and equipment involved, the treatment process employed, the engineering aspects of the application of various types of control techniques, process changes, and the reasonableness of cost-benefit relationships. The Idaho Policy Advisory Committee (IPAC), a CWA § 208 water quality planning committee, reviewed the studies and recommended that new limits be incorporated into Idaho’s State Water Quality Management Plan. Based upon these assessments and the actions of the State of Idaho, EPA determined in its best professional judgment that the following effluent discharge criteria would apply to Idaho’s aquaculture facilities.

Holding/Rearing Facility Discharge

TSS (net), instantaneous maximum limit:	15 mg/L
TSS (net), average monthly limit:	5 mg/L
Settleable solids (net), daily average limit:	0.1 ml/L

Waste Solids Treatment Pond Discharge

TSS, instantaneous maximum limit:	100 mg/L
TSS, minimum average daily removal efficiency:	85%
Settleable solids, instantaneous maximum limit:	1.0 ml/L
Settleable solids, minimum average daily removal efficiency:	90%

Additionally, EPA determined that best control technology for the collection and treatment of aquaculture wastes consisted of the installation of fish screens in the downstream end of active raceways which create quiescent settling areas or the downstream settling in a quiescent detention basin. Specific operational and best management practices were prescribed for the collection and treatment of the waste solids in raceways, ponds and settlement basins (JRB Associates 1984).

Federal regulations require that NPDES permits provide limits for both maximum daily discharges and average monthly discharges (40 CFR § 122.45); these limits must apply to the type of effluent monitoring conducted by permittees. While the technical assessments developed limits based upon grab samples, composite samples are used to monitor discharges by the aquaculture industry; composite samples combine numerous individual grab samples and reflect an average of the individual samples composited over the day. Thus EPA must translate the limits derived in terms of the above grab samples to limits appropriate for composite samples.

EPA's calculation of the maximum daily and average monthly concentration of TSS and settleable solids from the technology-based limits for these two parameters follows the "Technical support document for water quality-based toxics control" (TSD) (EPA 1991: sections 5.4-5.5) and "U.S. EPA NPDES Permit Writers' Manual" (EPA 1996). EPA recommends that the statistical procedures be used for the derivation of pollutant-specific limits for NPDES permits. The statistical procedure (see Table 5-3 of the TSD) establishes the relationship between a maximum limit for a time period (usually a month) and the average limit for that same time period as:

$$\frac{\text{maximum limit}}{\text{average limit}} = \frac{\exp\,[z_m\sigma - 0.5\sigma^2]}{\exp\,[z_a\sigma_n - 0.5\sigma_n{}^2]}$$

where:

$\sigma_n{}^2$ = $\ln([CV^2/n] + 1)$
σ^2 = $\ln([CV^2/1] + 1)$
CV = the coefficient of variation of the effluent = σ/μ
n = number of samples in monitoring period
z = z statistic
z_m = z for percentile exceedance probability of the maximum
z_a = z for percentile exceedance probability of the average
$z_{95\%}$ = 1.645, for 95th percentile occurrence probability
$z_{99\%}$ = 2.326, for 99th percentile occurrence probability

EPA developed this table of ratios between maximum daily and average monthly permit limits which guides calculations of maxima and averages when individual grab samples are collected. This table can be extended to relate maximum daily and average monthly composite limits to maximum instantaneous limits applied to individual grab samples. Composite samples are collected by permittees in order to characterize their effluent discharges with the cost-saving benefit of sampling four or more times while only paying for one analysis per pollutant parameter. Grab samples, on the other hand, are a key compliance tool of regulatory inspectors who may seek effluent samples during a one to two-hour inspection of a permitted facility.

EPA has derived limits for both total suspended solids and settleable solids using the above statistical method. In the case of TSS and settleable solids for raceways and ponds EPA finds that the intermittent variability supports the use of a coefficient of variation (CV) equal to 0.6 until sufficient data is available to support a more precise determination. In the case of TSS and settleable solids for offline settling basins sampled during the homogeneous period of treating the effluent from raceway quiescent zones EPA finds that the intermittent variability supports the use of a coefficient of variation (CV) equal to 0.3 until sufficient data is available to support a more precise determination. EPA has selected percentile probabilities of exceedance equal to 99% for the instantaneous maximum limit, 99% for the maximum daily limit, and 95% for the average monthly limit.

A composite sample represents a collection of individual grab samples. The daily composite sample size of a minimum of four (4) grab samples has a number of samples (n) equal to four, therefore, EPA used “n=4" for calculating maximum daily limits for the composited pollutant parameters from the raceways and ponds. The average monthly sample size for these composite samples taken once per week has a number of samples (n) equal to sixteen, therefore EPA used “n=16" for calculating the instantaneous maximum limits for TSS for raceways and ponds. For

grab samples the maximum daily limit would have an n=1, and an average monthly limit would have an n=4.

The set of three technology-based limits on TSS for the raceways and ponds is anchored by the net monthly average limit of 5 mg/L net TSS (JRB 1984); the instantaneous maximum limit was determined to be 15 mg/L net TSS (JRB 1984). The statistical procedure determines the following limit for maximum daily concentration (where n=4, CV=0.6):

$$\frac{\text{maximum limit}}{\text{~~average limit~~}} = \frac{\exp [z_m\sigma - 0.5\sigma^2]}{\exp [z_a\sigma_n - 0.5\sigma_n{}^2]} * \text{average limit} \Rightarrow$$

$$\text{maximum limit} = \frac{\exp [2.326 \times \{\ln(0.6^2/1+1)\}^{0.5} - 0.5 \times \{\ln(0.6^2/1+1)\}]}{\exp [1.645 \times \{\ln(0.6^2/4+1)\}^{0.5} - 0.5 \times \{\ln(0.6^2/4+1)\}]} \times \text{aver. limit TSS}$$

$$= \frac{\exp [(2.326 \times 0.5545) - (0.5 \times 0.3075)]}{\exp [(1.645 \times 0.2936) - (0.5 \times 0.08618)]} \times \text{average limit TSS}$$

$$= \frac{\exp [1.290 - 0.1538]}{\exp [0.4830 - 0.0431]} \times \text{average limit TSS}$$

$$= \{[\exp(1.136)] / [\exp(0.4399)]\} \times \text{average limit TSS}$$
$$= (3.115 / 1.553) \times \text{average limit TSS}$$
$$= 2.006 \times \text{average limit TSS}$$
$$= 2.006 \times 5 \text{ mg/L net TSS}$$
$$= 10.03 \text{ mg/L net TSS}$$
$$\approx 10 \text{ mg/L net TSS for a composite sample}$$

The JRB study provided an average daily limit on settleable solids for raceways and ponds of 0.1 ml/L settleable solids, which is the minimum detection limit for the Imhoff cone used in measuring settleable solids. The statistical procedure determines the following limit for maximum daily concentration (and instantaneous maximum limit, for n=4, CV=0.6):

$$\frac{\text{maximum limit}}{\text{~~average limit~~}} = \frac{\exp [z_m\sigma - 0.5\sigma^2]}{\exp [z_a\sigma_n - 0.5\sigma_n^2]} * \text{average limit} \Rightarrow$$

maximum daily limit = 2.01 * average limit settleable solids
= 2.01 * 0.1 ml/L settleable solids
= 0.201 ml/L net settleable solids
≈ 0.2 ml/L net settleable solids for a grab sample

instantaneous maximum limit = maximum daily limit for a grab sample
≈ 0.2 ml/L net settleable solids for a grab sample

The technology-based limits on TSS for the offline settling ponds are anchored by the instantaneous maximum limit on TSS for offline settling ponds of 100 mg/L TSS (JRB 1984). The statistical procedure determines the following limit average monthly concentration (where n=4, CV=0.3):

$$\frac{\text{maximum limit}}{\text{average limit}} = \frac{\exp [z_m\sigma - 0.5\sigma^2]}{\exp [z_a\sigma_n - 0.5\sigma_n^2]} \Rightarrow$$

$$\frac{\text{average limit}}{\text{~~maximum limit~~}} = \frac{\exp [z_a\sigma_n - 0.5\sigma_n^2] * \text{maximum limit}}{\exp [z_m\sigma - 0.5\sigma^2]} \Rightarrow$$

average monthly limit = 0.667 * instantaneous maximum limit = 0.667 * 100 mg/L TSS
= 66.7 mg/L TSS
≈ 67 mg/L TSS for a composite sample

maximum daily limit = instantaneous maximum limit TSS
= 100 mg/L TSS for a grab sample

The JRB study provided an instantaneous limit on settleable solids in offline settling basins of 1.0 ml/L settleable solids. The statistical procedure determines the following limit for the average monthly concentration (where n=4, CV=0.3):

maximum daily limit = instantaneous maximum limit settleable solids

$$\frac{\text{maximum limit}}{\text{average limit}} = \frac{\exp [z_m\sigma - 0.5\sigma^2]}{\exp [z_a\sigma_n - 0.5\sigma_n^2]} \Rightarrow$$

$$\frac{\text{average limit}}{\text{maximum limit}} = \frac{\exp [z_a\sigma_n - 0.5\sigma_n^2] * \text{maximum limit}}{\exp [z_m\sigma - 0.5\sigma^2]} \Rightarrow$$

average monthly limit = 0.667 * maximum daily limit settleable solids
= 0.667 * 1.0 ml/L settleable solids
= 0.667 ml/L settleable solids
≈ 0.7 ml/L settleable solids for grab samples

The technology-based limits for removal of TSS and settleable solids from wastewater in offline settling basins remain 85% and 90% respectively.

The following table summarizes the technology-based limits for aquaculture facilities in Idaho, expanded from determinations of “Final Report: Development of Effluent Limitations for Idaho Fish Hatcheries” (JRB 1984) to provide average monthly limits, maximum daily limits, and maximum daily instantaneous limits.

Wastewater Source and Pollutant	Average Monthly Limit	Maximum Daily Limit	Maximum Instantaneous Limit
Raceways and ponds			
TSS (mg/L)	5	10	15
Settleable solids (ml/L)	0.1	0.2	0.2
Offline settling ponds			
TSS (mg/L)	67	100	100
TSS, minimum removal (%)	85%	--	--
Settleable solids (ml/L)	0.7	1.0	1.0
Settleable solids, minimum removal (%)	90%	--	--

4.2.2 Fish processing and process-associated wastes

The following technology-based limits for fish processing in Idaho were developed by EPA using best professional judgment in its assessment of the industry (Culver 1975); these limits were applied in previous individual NPDES permits.

Effluent Characteristic	Effluent Limitations as Load (in pounds per 1,000 pounds raw processed fish)	
	Average monthly	Maximum daily
Biochemical oxygen demand, BOD_5	1.88	3.76
Total suspended solids, TSS	1.88	3.76
Oil and grease	1.0	2.0

EPA has developed and provided the following table of effluent concentrations which equate to effluent limitations as loads per 1,000 pounds processed fish for the above parameters. These concentrations incorporate the level of pounds processed, the amount of effluent flow and a factor for converting pounds processed divided by cubic feet per second (of flow) into milligrams per liter. The conversion factor used in converting from pounds per 1,000 pounds raw processed fish and gallons/day of flow to milligrams per liter concentrations is 0.119839 milligram-gallon/pound-liter. This table can guide butchering permittees as to the pollutant concentrations which will meet the above process-based load limits at their facilities as pounds processed and flow varies through time.

Effluent Characteristic	Equivalent Effluent Limitations as Concentrations (mg/L)	
	Average Monthly	Maximum Daily
Biochemical oxygen demand, BOD_5	0.225 x pounds processed /flow	0.451 x pounds processed /flow
Total suspended solids, TSS	0.225 x pounds processed /flow	0.451 x pounds processed /flow
Oil and grease	0.12 x pounds processed /flow	0.24 x pounds processed /flow

4.2.3 Sanitary wastewaters.

The Permit requires that sanitary wastewaters meet the standards of secondary wastewater treatment systems based upon EPA's best professional judgment that private sewage discharges should be held to the same standard as public sewage discharges in water quality-impaired receiving waters (CWA § 304(d); 40 CFR Part 133; EPA 1991). The minimum level of effluent quality is defined in terms of the parameters five-day biochemical oxygen demand (BOD5), total suspended solids (TSS), and pH.

40 CFR § 133.102 provides the minimum levels of effluent quality for secondary treatment. For both BOD5 and TSS: (1) the 30-day average concentration shall not exceed 30 mg/L, (2) the 7-day average concentration shall not exceed 45 mg/L, and (3) the 30-day average percent removal of BOD5 and TSS shall not be less than 85%. pH is limited within the range of the technology-based limits of 6.0 to 9.0.

In view of the low frequency of monitoring sanitary wastewater effluent, EPA finds that it is necessary to establish a maximum daily limit for BOD5 and TSS in order to effectively control sewage pollution of receiving waters. In addition, federal regulations require that NPDES permits provide limits for maximum daily discharges and average monthly discharges. Calculation of the maximum daily concentration of BOD5 and TSS follows the "Technical support document for water quality-based toxics control" (EPA 1991) and "U.S. EPA NPDES Permit Writers' Manual" (EPA 1996). Best professional judgment procedures determine that, using a coefficient of variation of 0.6 in concert with levels of statistical compliance of 99% for the daily maximum limit (MDL) and 95% for the monthly average limit (AML), the ratio MDL/AML is equal to 2.01. BPJ thus derives a maximum daily limit (MDL) as equal to 60 mg/L for both BOD5 and TSS (from 30 mg/L multiplied by 2.01).

4.3 Evaluation of water quality-based limitations

Section 302(a) of the Act requires the establishment of limitations in permits necessary to meet state water quality standards when technology-based effluent limitations are not protective of such state water quality standards. All discharges to receiving waters within a state must comply with state water quality standards, including the state's antidegradation policy. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under CWA § 401, including the authorization of any mixing zones.

The NPDES regulations at 40 CFR § 122.44(d)(1) require that permits include limits on all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality."

The regulations require that this evaluation be made using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation. A chemical-specific limit is required whenever an individual pollutant is at a level of concern relative to the numeric standard for that pollutant.

The facilities covered by this general NPDES permit discharge conventional, toxic, and nonconventional pollutants. Aquaculture facilities discharge live tank and pond water, disease control chemicals, drugs and disinfectants, water used to transfer fish to the facility, gray water, and sanitary waste water. Associated, on-site fish processing facilities discharge process water and entrained biological pollutants, disinfectants, water used to transfer fish to and within the facility, gray water, and sometimes sanitary waste water. Idaho State Water Quality Standards (IDAPA 16.01.02) directly address the following pollutants contained in these waste waters: ammonia; deleterious materials; dissolved oxygen; fecal coliform bacteria; floating, suspended or submerged matter; hazardous materials; nutrients (including phosphorus, nitrogen and carbon compounds); oil and grease; oxygen-demanding materials; pH; sediment; temperature; total residual chlorine (TRC); total suspended solids; toxic substances; and turbidity. Idaho State Water Quality Standards indirectly address biochemical oxygen demand (BOD5), biological waste materials (e.g., dead fish), residual disease control drugs and other chemicals, residual disinfectants, residual feed and nutritional supplements, and settleable solids through narrative standards for more generic “categories” of pollutants (e.g., toxic substances and floating, suspended or submerged matter).

State water quality standards provide for the authorization of a “mixing zone.” A mixing zone is a defined area or volume of the receiving water surrounding or adjacent to a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria or standards. It is considered a place were wastewater mixes with receiving water and not a place where effluents are treated (IDAPA 16.01.02.003.59). After a biological, chemical, and physical appraisal of the receiving water and the proposed discharge and after consultation with the person(s) responsible for the wastewater discharge, IDHW-DEQ will determine the applicability of a mixing zone, and, if applicable, its size, configuration and location (IDAPA 16.01.02.060).

4.3.1 Ammonia. Idaho’s State Water Quality Standard provides criteria limits for un-ionized ammonia at different temperatures and pH (IDAPA 16.01.02.250.02.c.iii). In the absence of appropriate data to indicate that the State standard is violated, EPA has not imposed a water quality-based limitation for ammonia. However, EPA seeks to confirm that the State water quality standard for ammonia is being met by these facilities and has required the monitoring of ammonia in the effluent

characterization study to support its assessment of this water quality issue as well as to develop data for a future TMDL for nitrogen-based nutrients.

4.3.2 Biochemical oxygen demand (BOD5). The Idaho Water Quality Standards do not specifically limit BOD5. However, the State standard does require that surface waters of the United States within Idaho shall be free from oxygen-demanding materials in concentrations that would result in an anaerobic water condition (IDAPA 16.01.02.200.07). In the absence of appropriate data to indicate that the State standard is violated, EPA has not imposed a water quality-based limitation for BOD5. However, EPA seeks to confirm that the State water quality standard for oxygen-demanding materials is being met by these facilities and has required the monitoring of BOD5 in the effluent characterization study to support its assessment of this water quality issue.

4.3.3 Biological wastes, e.g., dead fish. The Idaho Water Quality Standards do not specifically limit biological wastes. However, the State standard does require that surface waters of the United States within Idaho shall be free from floating, suspended, or submerged matter in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 16.01.02.200.05). Therefore, the Permit specifies that discharges from aquaculture facilities or associated, on-site fish processors shall not violate Idaho State Water Quality Standards for floating, suspended, or submerged matter. To assist in preventing violations of this limit, EPA requires the cleaning of any treatment technology used to control floating, suspended, or submerged matter.

4.3.4 Deleterious materials. Idaho's State Water Quality Standard requires that surface waters of the United States within Idaho shall be free from deleterious materials in concentrations that impair designated beneficial uses (IDAPA 16.01.02.200.03). Therefore, the Permit specifies that discharges from aquaculture facilities or associated, on-site fish processors shall not violate Idaho State Water Quality Standards for deleterious materials. Deleterious materials that may be present in discharges from these facilities would include any nontoxic substance which may cause the tainting of edible species of fish in the receiving water or which reduces the usability of the receiving water.

4.3.5 Dissolved oxygen. Idaho's State Water Quality Standard requires that dissolved oxygen concentrations shall exceed 6 mg DO/L at all times in waters designated as habitat for cold-water biota and salmonid spawning and shall exceed 5 mg DO/L in waters designated as habitat for warm-water biota (IDAPA 16.01.02.250.02.c.i). Based on information in the literature, EPA finds that aquaculture facilities may discharge wastewaters with DO concentrations as low as 4 mg DO/L and that associated, on-site fish processing facilities may often discharge wastewaters with DO concentrations as low as 2 mg DO/L. EPA has discussed the option of establishing mixing zones for dissolved oxygen for these facilities with IDHW-DEQ. Based on IDHW-DEQ's intention to provide mixing zones as necessary, this draft

permit does not contain limits for dissolved oxygen. *Should IDHW-DEQ determine not to* ***authorize mixing zones*** *for dissolved oxygen in its CWA § 401 certification of the Permit*, EPA will require that both aquaculture facilities and associated, on-site fish processors shall meet the water quality of 6 mg/L for cold water biota and salmonid spawning at the point of discharge. Additionally, EPA seeks to confirm that the State water quality standard for DO is being met by these aquaculture facilities and has required the monitoring of DO in the effluent characterization study to support its assessment of this water quality issue.

4.3.6 Fecal coliform and other bacteria. Idaho's State Water Quality Standard requires that fecal coliform bacteria shall not exceed 500 colonies/100 ml at any time and a geometric mean of 50/100 ml on a minimum of five (5) samples taken over a thirty day (30) period for protection of primary contact recreation between May 1 and September 30 (IDAPA 16.01.02.250.01.a). Idaho's State Water Quality Standard requires that fecal coliform bacteria shall not exceed 800 colonies/100 ml at any time and a geometric mean of 200/100 ml on a minimum of five (5) samples taken over a thirty day (30) period for protection of secondary contact recreation (IDAPA 16.01.02.250.01.b). The Permit imposes these standards as an end-of-pipe limitation for those facilities discharging sewage wastes directly to a receiving water rather than to a municipal sewage line which receives secondary treatment. EPA believes that this limitation will apply to no more than a few facilities which are located at sites without available municipal sewage lines or adequate land for septic system drain fields. In these circumstances secondary treatment and bacterial disinfection may be necessary to meet the limitations on sewage.

4.3.7 Floating, suspended or submerged matter. Idaho's State Water Quality Standard requires that surface waters of the United States within Idaho shall be free from floating, suspended, or submerged matter in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 16.01.02.200.05). Therefore, the Permit specifies that discharges from aquaculture facilities or associated, on-site fish processors shall not violate Idaho State Water Quality Standards for floating, suspended, or submerged matter. To assist in preventing violations of this limit, EPA requires the cleaning of any treatment technology used to control floating, suspended, or submerged matter.

4.3.8 Hazardous materials. Idaho's State Water Quality Standard requires that surface waters of the United States within Idaho shall be free from hazardous materials in concentrations found to be of public health significance or to impair designated beneficial uses (IDAPA 16.01.02.200.01). One beneficial use of particular concern for this Permit is aquatic life. Therefore, the Permit prohibits the discharge of hazardous materials.

4.3.9 Nutrients, including phosphorus, nitrogen and carbon compounds. Idaho's State Water Quality Standard requires that surface waters of the United States within Idaho shall be free from excess nutrients that can cause visible slime growths or

other nuisance aquatic growths impairing designated beneficial uses (IDAPA 16.01.02.200.06). IDHW-DEQ has developed, and is developing, TMDL determinations for phosphorus and nitrogen compounds in impaired watersheds throughout Idaho. TMDLs have been completed for phosphorus in the Middle Snake River watershed and the Billingsley Creek watershed as of this Permit issuance; additional TMDLs for total phosphorus in other Idaho watersheds are under development. IDHW-Division of Environmental Quality has indicated that compliance with these limitations on nutrient loads of total phosphorus will be delayed in accordance with a ***schedule of compliance*** to be included in the State's certification of the Permit.

A water quality-based limit for total phosphorus concentrations throughout Idaho is required in the Permit in order to support the above Idaho Water Quality Standard. EPA's water quality criteria for total phosphorus in flowing streams not entering a lake or reservoir is a concentration of 0.1 mg/L (EPA 1976; MacKenthun 1973, Hutchinson 1957, et al.); this is interpreted here as an average monthly limit. This limit applies to aquaculture facilities in the mid-Snake and Billingsley Creed watersheds until such time that the facilities must comply with stricter limits developed in TMDLs.

EPA finds that the low variability of phosphorus in raceways and ponds supports the use of a coefficient of variation (CV) equal to 0.2 until sufficient data is available to support a more precise determination. The daily composite sample size of a minimum of four (4) grab samples has a number of samples (n) equal to four, therefore EPA used "n=4" for calculating maximum daily limits for the two pollutant parameters. The average monthly sample size for these composite samples taken once per week has a number of samples (n) equal to sixteen, therefore EPA used "n=16" (= 4 x 4) for calculating the instantaneous maximum limit for phosphorus for raceways and ponds. EPA has selected percentile probabilities of exceedance equal to 99% for the instantaneous maximum limit, 99% for the maximum daily limit, and 95% for the average monthly limit.

The statistical procedure determines the following limit for maximum daily concentration (where n=4, CV=0.2) and instantaneous maximum concentration (where n=16, CV=0.2) for total phosphorus in combined discharges from raceways and ponds and offline settling ponds:

$$\frac{\text{maximum limit}}{\text{~~average limit~~}} = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_n - 0.5\sigma_n^2]} * \text{average limit} \Rightarrow$$

$$\begin{aligned}\text{maximum daily limit} &= 1.33 * \text{average limit total phosphorus} \\ &= 1.33 * 0.1 \text{ mg/L net total phosphorus} \\ &= 0.133 \text{ mg/L net total phosphorus} \\ &\approx 0.13 \text{ mg/L net total phosphorus}\end{aligned}$$

$$\frac{\text{maximum limit}}{\text{~~average limit~~}} = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_n - 0.5\sigma_n^2]} * \text{average limit} \Rightarrow$$

$$\begin{aligned}\text{maximum instantaneous limit} &= 1.43 * \text{average limit total phosphorus} \\ &= 1.43 * 0.1 \text{ mg/L net total phosphorus} \\ &= 0.143 \text{ mg/L net total phosphorus} \\ &\approx 0.14 \text{ mg/L net total phosphorus}\end{aligned}$$

Water quality-based limits for total phosphorus loads have been developed for specific facilities in the Middle Snake River watershed in accordance with the TMDL allocations for the watershed. These allocations may be updated and revised during the term of this Permit and necessitate its modification. Additional TMDLs may be completed during the term of this Permit and may also necessitate modification of the Permit at the appropriate time.

Currently, there are not sufficient data to establish water quality-based limits for nitrogenous nutrients. The key contributors to the nitrogen cycle are nitrate, nitrite, ammonia and organic nitrogen. The organic nitrogen can be composed of proteins, peptides, nucleic acids, synthetic organic compounds, and urea. Both ammonia and urea are of possible concern as a nitrogen source in aquaculture (e.g., Kendra 1991, Westers 1989), though agriculture and other sources may contribute much larger amounts of nitrogenous nutrients to the rivers of Idaho (Clark and Ott 1996, MacMillan 1992). The Kjeldahl test will measure the organic nitrogen (including urea) and ammonia, but will not detect nitrate or nitrite according to Standard Methods. The Permit requires the monitoring of ammonia, nitrate-nitrite, and total Kjeldahl nitrogen in a one-year effluent characterization study. IDHW-DEQ projects the completion of a TMDL for nitrogenous nutrients before the expiration of this Permit.

4.3.10 Oil and grease. Idaho's State Water Quality Standards do not directly provide a criterion for oil and grease. However, the State standard requires that surface

waters of the United States within Idaho shall be free from floating, suspended, or submerged matter in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 16.01.02.200.05). The Permit, therefore, provides that there shall not be any visible scum or sheen in the effluent of aquaculture facilities or their associated, on-site food processors.

4.3.11 Oxygen-demanding materials. Idaho's State Water Quality Standard requires that surface waters of the United States within Idaho shall be free from oxygen-demanding materials in concentrations that would result in an anaerobic water condition (IDAPA 16.01.02.200.07). As above for BOD5, in the absence of appropriate data to indicate that the State standard is violated, EPA has not imposed a water quality-based limitation for BOD5, an indicator parameter for oxygen-demanding materials. However, EPA seeks to confirm that the State water quality standard for oxygen-demanding materials is being met by these facilities and has required the monitoring of BOD5 in the effluent characterization study to support its assessment of this water quality issue.

4.3.12 pH. Idaho's State Water Quality Standard requires that hydrogen ion concentration values shall be within the range of 6.5 to 9.5 (IDAPA 16.01.02.250.02.a.i). The Permit restricts discharges to a minimum pH of 6.5 as a water quality-based limit for aquaculture facilities, associated, on-site food processors and sewage treatment facilities. The Permit restricts discharges to a maximum of pH of 9.5 as a water quality-based limit for aquaculture facilities and to 9.0 as a technology-based limit for associated, on-site fish processors. The Permit requires appropriate effluent monitoring for pH in food processors, sanitary wastes and offline settling basin discharges.

4.3.13 Residual disease control drugs and other chemicals. The Idaho Water Quality Standards do not specifically limit residual disease control drugs and other chemicals. However, State standards do exist for toxic substances (see below) which may apply to disease control drugs and other chemicals used to emerse fish for treatment. EPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses, though some literature suggests that there may be significant risks to such discharges (Raloff 1997, Hartmann et al. 1998; Buser et al. 1998). On the other hand, EPA believes that chemicals applied in solution for the emersive treatment of fish may present a risk of harm to aquatic life, including endangered or threatened species, immediately downstream of a point of discharge. However, no data exist to support the development of water quality-based limitations for such chemicals. Further, EPA has determined that the normal operating procedures at aquaculture facilities should provide for maximum dilution in the discharge of such emersive chemical treatments. Therefore, rather than impose end-of-pipe limits on chemicals which are expensive and difficult to analyze, EPA may require the testing of whole effluent toxicity (WET) of the discharges associated with disease control drugs and other chemicals, pending

analysis by EPA of chemical usage data submitted by facilities in the first year of the permit. *If and only if* the analysis shows reasonable potential to cause or contribute to an instream excursion above Idaho's toxic substances criteria, the draft permit requires that WET testing will be conducted by the largest facilities in the state (those producing or feeding more than one million pounds per year or having more than 40 cfs of flow).

4.3.14 Residual disinfectants. The Idaho Water Quality Standards do not specifically limit residual disinfectants. However, State standards do exist for toxic substances (IDAPA 16.01.02.200.02) which may apply to disinfectants. EPA believes that disinfectants applied for the treatment, cleansing and disinfection of facilities and their equipment may present a risk of harm to aquatic life, including endangered or threatened species, immediately downstream of a point of discharge. However, no data exist to support the development of water quality-based limitations for such chemicals. Further, EPA has determined that the normal operating procedures at aquaculture facilities should provide for maximum dilution in the discharge of disinfectants. Therefore, rather than impose end-of-pipe limits on chemicals expensive and difficult to analyze, EPA may require testing of whole effluent toxicity (WET) of the discharge associated with disinfectants, pending analysis by EPA of chemical usage data submitted by facilities in the first year of the permit. *If and only if* the analysis shows reasonable potential to cause or contribute to an instream excursion above Idaho's toxic substances criteria, the draft permit requires that WET testing will be conducted by the largest facilities in the state (those producing or feeding more than one million pounds per year or having more than 40 cfs of flow).

4.3.15 Residual feed and nutritional supplements. The Idaho Water Quality Standards do not specifically limit residual feed and nutritional supplements. However, the State standard does require that surface waters of the United States within Idaho shall be free from floating, suspended, or submerged matter (IDAPA 16.01.02.200.05), oxygen-demanding materials (IDAPA 16.01.02.200.07), and excess nutrients (IDAPA 16.01.02.200.06). EPA has determined that the Permit controls the discharge of residual feed and nutritional supplements with limits associated with each of these standards.

4.3.16 Sediment. Idaho's State Water Quality Standard requires that sediment shall not exceed quantities which impair designated beneficial uses (IDAPA 16.01.02.200.08). EPA finds that aquaculture facilities do not generate significant quantities of sediments and has addressed the generation of ash solids as limitations on total suspended solids (below). EPA believes that aquaculture facilities using sediment-laden water as their influents may serve as "sinks" (rather than "sources") for sediments, allowing suspended sediment solids to settle out of the water column while transiting through a facility.

4.3.17 Settleable solids. The Idaho Water Quality Standards do not specifically limit settleable solids. However, State standards do exist for floating, suspended and submerged matter (IDAPA 16.01.02.200.05), oxygen-demanding materials (IDAPA 16.01.02.200.07), excess nutrients (IDAPA 16.01.02.200.06), and sediment (IDAPA 16.01.02.200.08). DMR reports of settleable solids from aquaculture facilities indicate that their discharges contain very low volumes of settleable solids (less than 0.2 ml/L for raceways and less than 1.0 ml/L for settling ponds). In some cases aquaculture facilities actually reduce the load of the sediment fraction of settleable solids from the levels in facility influents.

EPA believes that settleable and suspended solid wastes generated in aquaculture facilities and associated, on-site fish processing facilities contain significant amounts of organic carbon nutrients. These organic residues may contribute to the development of deposits of nutrient-rich, oxygen-demanding material at and downstream of points of discharge as well as nutrient-enrichment of the receiving water. The Permit therefore requires increased levels of net recovery of settleable solids of 95% in settling basin effluents (as contrasted with 90% in the expired individual permits). Facilities discharging into Billingsley Creek are given an instantaneous maximum effluent limit of 0.5 ml/L settleable solids from settling basins (half the 1.0 ml/L limit for facilities discharging to other receiving waters), in response to water quality studies conducted by DEQ from 1986-1992 showing that solids are of concern and that extensive sludge deposits exist below some of the facilities (cited in the Problem Assessment-Billingsley Creek (IDHW-DEQ, 1992), see also *Billingsley Creek TMDL,* IDHW-DEQ, 1992). The statistical procedure (from the TSD) determines the following limit for the average monthly concentration (where n=4, CV=0.3):

maximum daily limit = instantaneous maximum limit settleable solids

$$\frac{\text{maximum limit}}{\text{average limit}} = \frac{\exp\left[z_m\sigma - 0.5\sigma^2\right]}{\exp\left[z_a\sigma_n - 0.5\sigma_n^2\right]} \Rightarrow$$

$$\frac{\text{average limit}}{\text{~~maximum limit~~}} = \frac{\exp\left[z_a\sigma_n - 0.5\sigma_n^2\right] * \text{maximum limit}}{\exp\left[z_m\sigma - 0.5\sigma^2\right]} \Rightarrow$$

average monthly limit = 0.667 * maximum daily limit settleable solids
= 0.667 * 0.5 ml/L settleable solids
= 0.667 ml/L settleable solids
≈ 0.3 ml/L settleable solids for grab samples

As a second component of regulating this and other pollutant discharges, best management practices operating plans are focused, in particular, on
(1) minimizing the generation of total suspended solids through efficient feeding

practices, including both the content and provision of feeds, and (2) recovering total suspended solids through segregated raceways and periodic removal of settled waste residues from fish-free lengths of raceways to off-line settling basins. The BMP operating plan requires a mass balance for pollutants within the aquaculture facilities and associated, on-site processing facilities. The mass balance assessment will serve as a tool for improving efficiency in the treatment and reduction of pollutants and, coincidentally, the efficiency of aquaculture production.

Additionally, the Permit requires the submission of an annual report of operations that lists the inputs and outputs of aquaculture facilities and associated, on-site fish processing facilities. This report will ensure that the data necessary to complete mass balance assessments are available. The report will provide the regulatory agencies with the ability to monitor industry activity and to secure consistent, accurate and precise data on the interconnected processes of product production and pollution production.

Finally, EPA has required a sediment study of the largest aquaculture facilities in Idaho (producing or feeding more than one million pounds per year or having more than 40 cfs of flow). These studies will determine the presence or absence and, if present, the extent of deposits of organic residues at and downstream from the point of discharge at aquaculture facilities.

4.3.18 Temperature. Idaho's State Water Quality Standard requires that water temperatures shall not exceed an instantaneous maximum of twenty-two (22) degrees centigrade or less, with a maximum daily average of no greater than nineteen (19) degrees centigrade in waters designated as habitat for cold-water biota (IDAPA 16.01.02.250.02.c.ii). The State Water Quality Standard for waters designated for salmonid spawning requires that water temperatures shall not exceed an instantaneous maximum of thirteen (13) degrees centigrade or less, with a maximum daily average of no greater than nine (9) degrees centigrade (IDAPA 16.01.02.250.02.d.ii). EPA finds that warm-water aquaculture facilities using hot water influents drawn up through deep wells, in particular, may create uncharacteristically warm effluent inputs into waters designated for cold-water and salmonid spawning uses. Authorization to discharge to such habitats should be sought through the use of a mixing zone variance under the Idaho Water Quality Standards. However, receiving waters throughout Idaho are characterized by temperature increases above Idaho Water Quality Standards and are listed as impaired (IDHW-DEQ 1996). The Idaho Water Quality Standards do not provide for a mixing zone variance for receiving waters exceeding criteria for the designated use for that receiving water (IDAPA 16.01.02.060.01.g). Many of Idaho's streams and rivers have lost natural riparian zones and are thereby warmed to higher temperatures. Additionally, most rivers receive much more warm water from agricultural return flow than from the aquaculture facilities through which stream, river and spring water is diverted with nominal retention

time and nominal increases in temperature (e.g., Brannon 1991, Borgiotti 1995). Idaho has determined that the Middle Snake River and many other stream segments require the determination of total maximum daily loads (TMDLs) for temperature and has scheduled these assessments (IDHW-DEQ 1997); the Middle Snake is currently under study and the TMDL is scheduled for completion in 1999.

EPA has therefore determined to monitor the increases in temperature at aquaculture facilities as a component of the effluent characterization monitoring study during the first year of the Permit. Data developed in the characterization of temperature increases between influents and effluents at aquaculture facilities is relatively simple to collect and will support the development of the temperature TMDLs for the Middle Snake and other watersheds in future years.

4.3.19 Total residual chlorine (TRC). Idaho's State Water Quality Standard requires that TRC shall not exceed a one (1) hour average concentration of nineteen (19) ug/L nor a four (4) day average concentration of eleven (11) ug/L for waters classified for aquatic life use (IDAPA 16.01.02.250.02.a.iii). EPA does not believe that TRC is generated in the course of aquaculture rearing but finds that chlorine products are used in bacterial decontamination in some sewage treatment plants and may be used in equipment sanitization in fish processing facilities. Therefore, the Permit includes limitations equivalent to the State standards at the end-of-pipe for sewage discharges and fish processor discharges. Permittees may wish to apply for mixing zones for TRC limits from IDHW-DEQ after monitoring levels of TRC in their effluents.

4.3.20 Total suspended solids. The Idaho Water Quality Standards do not specifically limit total suspended solids. However, State standards do exist for floating, suspended and submerged matter (IDAPA 16.01.02.200.05), deleterious materials (IDAPA 16.01.02.200.03), oxygen-demanding materials (IDAPA 16.01.02.200.07), and excess nutrients (IDAPA 16.01.02.200.06). DMR reports of total suspended solids from aquaculture facilities indicate that their discharges contain low concentrations of TSS (approaching method detection limits). In some cases aquaculture facilities actually appear to reduce the load of the total suspended solids from the levels in facility influents.

EPA believes that suspended (and settleable) solid wastes generated in aquaculture facilities and associated, on-site fish processing facilities contain significant amounts of organic carbon nutrients. These organic residues may contribute to the development of deposits of nutrient-rich, oxygen-demanding material at and downstream of points of discharge as well as nutrient-enrichment of the receiving water. The Permit therefore requires increased levels of net recovery of total suspended solids of 90% in settling basin effluents (as contrasted with 85% in the expired individual permits).

As a second component of regulating this and other pollutant discharges, best management plans are focused, in particular, on (1) minimizing the generation of total suspended solids through efficient feeding practices, including both the content and provision of feeds, and (2) recovering total suspended solids through segregated raceways and periodic removal of settled waste residues from fish-free lengths of raceways to off-line settlement basins. The BMP plan requires a mass balance for pollutants within the aquaculture facilities and associated, on-site processing facilities. The mass balance assessment will serve as a tool for improving efficiency in the treatment and reduction of pollutants and, coincidentally, the efficiency of aquaculture production.

Additionallly, the Permit requires the submission of an annual report of operations that lists the inputs and outputs of aquaculture facilities and associated, on-site fish processing facilities. This report will ensure that the data necessary to complete mass balance assessments are available. The report will provide the regulatory agencies with the ability to monitor industry activity and to secure consistent, accurate and precise data on the interconnected processes of product production and pollution production.

Finally, EPA has required a sediment study of the largest aquaculture facilities (producing or feeding more than one million pounds per year or having more than 40 cfs of flow) discharging to the Middle Snake River or its tributaries. These studies will determine the presence or absence and, if present, the extent of deposits of organic residues at and downstream from the point of discharge at aquaculture facilities.

4.3.21 Toxic substances. Idaho's State Water Quality Standard requires that toxic substances shall not be present in concentrations that impair designated beneficial uses (IDAPA 16.01.02.200.02). This standard may apply to residual disease control drugs and other chemicals, or residual disinfectants (see above). EPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses. On the other hand, EPA believes that chemicals applied in solution for the emersive treatment of fish, and disinfectants applied for the treatment, cleansing and disinfection of facilities and their equipment may present a risk of harm to aquatic life, including endangered or threatened species, immediately downstream of a point of discharge. However, no data exist to support the development of water quality-based limitations for such chemicals. Further, EPA has determined that the normal operating procedures at aquaculture facilities should provide for maximum dilution in the discharge of such chemicals. Therefore, rather than impose end-of-pipe limits on chemicals expensive and difficult to analyze, EPA may require testing of whole effluent toxicity (WET) of the discharges associated with disease control chemicals, drugs, and disinfectants, pending analysis by EPA of chemical usage data submitted by facilities in the first year of the permit. *If and only if* the analysis shows reasonable potential to cause

or contribute to an instream excursion above Idaho's toxic substances criteria, the draft permit requires WET testing be conducted by the largest facilities in the state (those producing or feeding more than one million pounds per year or having more than 40 cfs of flow).

4.3.22 Turbidity. Idaho's State Water Quality Standard requires that Turbidity shall not exceed background turbidity by more than fifty (50) NTU instantaneously or more than twenty-five (25) NTU for more than ten (10) consecutive days (IDAPA 16.01.02.250.02.c.iv). EPA's information on aquaculture facilities, fish processing facilities and small sewage treatment plants indicates that the discharges of these facilities do not violate the State standard for turbidity. Therefore, the Permit does not include limitations for turbidity.

4.4 Mixing zone. IDHW-Division of Environmental Quality authorizes mixing zones for meeting Idaho Water Quality Standards for dissolved oxygen (DO) in flowing receiving waters limited to the following: (1) The cumulative width of the adjacent mixing zones when measured across the receiving water is not to exceed fifty percent (50%) of the total width of the receiving water at that point; (20 The width of the mixing zone is not to exceed twenty-five percent (25%) of the stream width or three hundred (300) meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; (3) The mixing zone is to be no closer to the ten (10) year, seven (7) day low-flow shoreline than fifteen percent (15%) of the stream width; (4) The mixing zone is not to include more than twenty-five (25%) of the volume of the stream flow. Applicants may ***request the authorization of a state-wide mixing zone*** for meeting the water quality standard for dissolved oxygen and may request individual mixing zones for other pollutant discharges.

4.5 Compliance schedule. The *Middle Snake River Watershed Management Plan* (IDHW-DEQ, 1997) requires the final waste load allocation to be met over the next five years. Future TMDLs for other watersheds may have similar requirements. In accordance with Section 16.01.02.400.03 of the Idaho Water Quality Standards, discharge permits can incorporate compliance schedules which allow a discharger to phase in compliance with water-quality-based effluent limits when new limits are in the permit for the first time. This Permit, therefore requires compliance with the pollutant load effluent limitations as listed in Appendix I on or before the expiration date of the Permit. Consistent with 40 CFR § 122.47, the permittee will be required to submit annual reports which document progress toward reaching the final compliance level. Compliance with the pollutant concentration limits (V.B.1.) for the same pollutants must be met in the interim.

4.6 Effluent limitations summary. The following tables compare numeric limitations in the 1990 permit and this proposed 1998 permit (type of sample is provided in parentheses).

Limitations on Raceway, Pond and All Other Aquaculture Discharges except offline settling basin discharges				
Parameter	Minimum Daily	Average Monthly	Maximum Daily	
	1990 and 1998	1990 and 1998	1990	1998
Settleable Solids (ml/L)	none	0.1	none	0.2 (grab)
Total Suspended Solids, Net TSS (mg/L)	none	5 (composite)	15 (composite)	10 (composite); 15 (grab)

Limitations on Offline Settling Basin Discharges						
Parameter	Minimum Daily		Average Monthly		Maximum Daily	
	1990	1998	1990	1998	1990	1998
Settleable Solids (ml/L)	None	None	None	0.7 (0.3)*	1.0 (composite)	1.0 (grab); (0.5 grab)*
Settleable Solids (% removal)	90	95	None	None	None	None
Total Suspended Solids, Net TSS (mg/L)	None	None	None	67 (grab)	100 (composite)	100 (grab)
Total Suspended Solids (% removal)	85	90	None	None	None	NA

*Proposed limit on settleable solids for facilities discharging to Billingsley Creek .

Limitations on combined discharges from raceways, ponds, offline settling basins, and all other aquaculture discharges				
Pollutant	Minimum Daily	Average Monthly	Maximum Daily	Instantaneous Maximum
Total Phosphorus net (TP; mg/L)	--	0.10 (composite)	0.13 (composite)	0.14 (grab)

The permits issued to fish processing facilities in 1990 contained technology-based limitations on total suspended solids, biochemical oxygen demand, and oil and grease solids and water quality-based limitations on floating solids, visible foam, pH, and chemicals in toxic amounts. The permits also required that processing waste solids, sludge, filter backwash and other pollutants removed in the treatment of wastewaters be disposed on in a manner so as to prevent any pollutant from such materials from entering the waters of the United States.

Limitations on Fish Processing Discharges						
	Monthly Average		Minimum Daily		Maximum Daily	
Parameter	1990	1998	1990	1998	1990	1998
Biochemical oxygen demand (BOD5, lbs/1000 lbs produced)	1.88	1.88	None	None	3.76	3.76
Total suspended solids (TSS, lbs/1000 lbs produced)	1.88	1.88	None	None	3.76	3.76
Oil and grease (lbs/1000 lbs produced)	1.0	1.0	None	None	2.0	2.0
pH	None	None	6.0	6.5	9.0	9.0
Total residual chlorine, (TRC, ug/L)	none	11	None	None	none	19

* Applies only when chlorine disinfection is in use. EPA has set forth reporting thresholds to measure the highest acceptable quantification levels for total residual chlorine. The reporting thresholds do not authorize discharge in excess of the effluent limits. The value reported may be designated as the interim minimum level for chlorine of 20 ug/L, based upon the low-level amperometric or DPD methods described by Standard Methods, 18th edition, Section 4500-Cl E and G, referenced in 40 CFR § 136.

5 WHAT MONITORING IS REQUIRED BY THE GENERAL PERMIT

A monitoring program is required to assess the effects of aquaculture facility and fish processor discharges on the water surface, shoreline and river bed. Monitoring will be conducted in accordance with the potential risk of a violation of Idaho State Water Quality Standards or an impact on the receiving water resources. In accordance with the recommendations of the National Research Council (NRC 1990), the Permit provides goals, objectives and evaluative criteria for the environmental monitoring program during the term of the Permit.

5.1 Effluent monitoring

5.1.1 Permit compliance monitoring

The following effluent monitoring requirements have been included in the Permit pursuant to section 308 of the Act and 40 CFR §122.44(I). Aquaculture facilities are required to monitor flow, settleable solids, total suspended solids, total phosphorus, BOD5 and pH in effluents for compliance with permit limitations.

The federal and state managers of water quality and pollutant discharges have determined that this general NPDES permit will seek to develop an accurate and extensive set of data on the “net” or incremental contribution of individual dischargers to pollutant levels in receiving waters. These data should support present and future protection of water quality and aquatic habitats while pursuing a fair and equitable treatment of all sources of pollutants entering the receiving waters within the State of Idaho. The Permit therefore requires monitoring of pollutant parameters in both influent and effluent streams, while allowing permittees to utilize the value of zero for influent streams which they choose not to monitor.

Monitoring frequencies are based on the minimum sampling necessary to adequately monitor a facility’s performance in accordance with size of the facility. The frequency of monitoring effluent flow and pollutants varies according to four size classes for aquaculture facilities with more than a 400-fold range in production capacity of from 20,000 lbs to over 8,000,000 lbs of fish per year. The Permit requires weekly monitoring of fish processing facilities and any sewage treatment plants at and supporting an aquaculture facility during intermittent months throughout the year. The Permit provides for sampling of composite samples of some pollutants by permittees and of grab samples of all pollutants by government inspectors. Guidance and supporting references are provided within the Permit for assuring the development of high quality data.

Facility	**Frequency** of Permit Compliance Monitoring (during operation)
1. aquaculture facility either producing or feeding greater than or equal to 1,000,000	Weekly
2. aquaculture facility either producing or feeding greater than or equal to 500,000 and less than 1,000,000	Monthly
3. aquaculture facility either producing or feeding greater than or equal to 100,000 and less than 500,000	Quarterly
4. aquaculture facility either producing or feeding greater than or equal to 20,000 and less than 100,000 lbs/yr	Annually
fish processing facility	During one month per quarter: Weekly for flow, TSS, and pH; Monthly for TP, BOD5, oil and grease, and nitrogenous nutrients
sanitary waste treatment facility	During one month per quarter: Weekly for flow, TSS, BOD5, TRC and pH; Five times per month for fecal coliform bacteria; Monthly for nitrogenous nutrients

5.1.2 Effluent characterization monitoring for TMDLs

The *Middle Snake River Watershed Management Plan* (IDHW-DEQ 1997) recommends testing for phosphorus in the first three years of the TMDL implementation. Data are also needed for the development of future TMDLs and the determination of wasteload allocations for nitrogenous nutrients and temperature.

EPA has considered these recommendations in view of the expense of collecting and analyzing these pollutant parameters. EPA determined that permittees throughout Idaho should monitor flow, settleable solids, total suspended solids, total phosphorus, ammonia, nitrate-nitrite, total Kjeldahl nitrogen, temperature, pH, dissolved oxygen and five-day biochemical oxygen demand in an effluent

characterization study of one year duration. EPA believes that this effluent characterization monitoring will support the final determination of waste load allocations of phosphoric nutrients in present and future TMDLs as well as support the determination of TMDLs for nitrogenous nutrients and temperature in the near future.

Facility	**Frequency** of Effluent Characterization Monitoring for TMDLs (during operation)	
	Settleable solids, TSS, TP, pH and temperature	Nitrogenous nutrients, DO and BOD5.
aquaculture facility either producing or feeding greater than or equal to 1,000,000	Weekly for one year	Monthly for one year
aquaculture facility either producing or feeding greater than or equal to 500,000 and less than 1,000,000	Twice Monthly for one year	Monthly for one year
aquaculture facility either producing or feeding greater than or equal to 100,000 and less than 500,000	Monthly for one year	Quarterly for one year
aquaculture facility either producing or feeding greater than or equal to 20,000 and less than 100,000 lbs/yr	Quarterly for one year	Quarterly for one year

The general permit requires the monitoring of nitrogenous nutrients (ammonia, nitrate-nitrite and total Kjeldahl nitrogen), dissolved oxygen and five-day biochemical oxygen demand less frequently than the monitoring of settleable solids, total suspended solids, total phosphorus, pH and temperature for the facility size classes of 100,000 lbs production per year or more. The former suite of pollutant parameters are being monitored strictly to develop data which verifies assumptions concerning concentrations of dissolved oxygen and oxygen-demanding materials in the effluent and which will support the determination of TMDLs for nitrogenous nutrients. The latter suite of pollutants are monitored for both compliance and characterization purposes.

5.2 Whole effluent toxicity study

In accordance with 40 CFR 122.44(d)(1), EPA is required to evaluate a discharge for its reasonable potential to cause or contribute to an instream excursion above numeric and narrative water quality criteria. Where insufficient data exists to complete a reasonable potential evaluation of narrative criteria, EPA will require whole effluent toxicity (WET) testing. This WET testing will help to establish whether or not the discharge is in compliance with the state's water quality standards criteria for toxic substances (IDAPA 16.01.02.200.02). The required toxicity testing program is aimed at determining acute and chronic biological effects of the discharges. WET testing has been widely used by the Agency in ambient monitoring studies and other NPDES permits.

In the case of aquaculture facilities in Idaho, data on amounts of potentially toxic substances discharged, *i.e*., disease control chemicals, drugs and disinfectants, are insufficient to develop an analysis of the reasonable potential to cause or contribute to an instream excursion above Idaho's toxic substances criteria. The current draft permit requires the submission of data on chemical usage by permittees to provide the necessary data to perform the reasonable potential analysis.

Disease control chemicals and drugs are currently regulated through the U.S. Food and Drug Administration to protect for human health concerns associated with ingestion of fish exposed to these chemicals in the fish rearing environment. The U.S. Food and Drug Administration does not regulate these chemicals to protect aquatic organisms in the receiving waters of the discharging aquaculture facilities. The U.S. Food and Drug Administration controls alone cannot ensure that complex effluent effects are not occurring, including cumulative effects when effluent mixes with receiving water.

EPA requests the following information, at a minimum, be submitted by permittees during the first year of the Permit term:

- The disease control chemical, drug or disinfectant common name and active ingredients
- Amount used
- Timing: when and for how long
- Effluent and receiving water flow
- Material Safety Data Sheets for each disease control chemical, drug or disinfectant being used

EPA will use the information to determine if there is reasonable potential to cause or contribute to an instream excursion above Idaho's toxic substances criteria. *If and only if* there is reasonable potential, WET tests will be required of the largest facilities in the State and the information on chemical usage will be used to determine the appropriate frequency of toxicity testing. It is expected that each of the listed aquaculture facilities (those facilities producing or feeding more than one

million pounds per year or having more than 40 cfs of flow) will perform at least one effluent test and one upstream receiving water test. The upstream receiving water test is necessary to assess the effects of upstream sources, for example irrigation returns. Those facilities whose influent water is from a stream, canal, or river will perform WET tests of influent water to ensure any measured toxicity in the effluent is not from the influent water. If influent water is not tested and the effluent test results show toxicity, these facilities would be required to perform an influent water test concurrently with a re-sample and re-test of their effluent and receiving water.

Because the discharge of chemicals of concern occurs in batches rather than continuously, acute toxicity tests (i.e., short-term exposures) are being required. The acute tests reflect more accurately the intermittent exposure of ambient organisms to the discharge. However, to address potential chronic toxicity that may occur due to intermittent exposure, an acute to chronic ratio (ACR) of 10 will be used to convert the acute toxicity results to chronic toxicity.

In this draft permit WET testing replaces chemical analyses for disease control chemicals, drugs and disinfectants in the effluent. Aquaculture facilities use a number of chemicals from time to time depending on the disease or problem encountered. Some of these chemicals are difficult and costly to analyze.

5.3 Sediment monitoring program

The largest aquaculture facilities in Idaho (producing or feeding more than one million pounds per year or having more than 40 cfs of flow) discharging to the Middle Snake River or its tributaries will conduct sediment monitoring. The sediment monitoring will determine the presence and extent of the deposition of aquaculture residues at and downstream from the point of discharge.

Federal and State inspectors have observed that, in some cases, permit limitations are not (1) preventing downstream deposition of aquaculture residues, (2) ensuring attainment of State water quality standards and (3) protecting in-stream habitat. The Permit, therefore, requires sediment monitoring by the largest discharges to the Middle Snake or its tributaries in order to assess downstream deposition in relation to the Idaho Water Quality Standards for floating, suspended or submerged matter of any kind (IDAPA 16.01.02.200.05), nutrients (IDAPA 16.01.02.200.06), oxygen-demanding materials (IDAPA 16.01.02.200.07), deleterious materials (IDAPA 16.01.02.200.03), and toxic substances (IDAPA 16.01.02.250.02).

5.4 Annual report of operational log

The most important and cost-effective method of controlling the pollutants generated and discharged by an aquaculture facility is the efficient operation of the facility (Stechey and Trudell 1990). Efficient operations pertain to the full range of day-to-day activities of stocking the holding and rearing areas, feeding and grading

the fish, and cleaning the quiescent zones and settling basins. Fish feed management, managing (1) the composition of fish food so as to secure optimal assimilation and utilization and (2) the provision of feed to fish so as to secure maximum consumption, is the most important asset in the control of nutrients which fish excrete and which dissolve quickly from feed and feces into the waters passing through an aquaculture facility. Fish health management, managing fish health through (1) high quality raceway and pond habitats and water quality and (2) the judicious use of disease control chemicals and disinfectants which protect and cure fish without damaging aquatic life in receiving waters, is the most important asset in the control of potentially deleterious and toxic materials. Aquaculture waste solids management, involving the collection and removal for disposal of wasted feed pellets, feces and fish carcasses, is the most important aspect in the control of floating, suspended and submerged matter and the carbonaceous nutrients which constitute the majority of the oxygen-demanding materials affecting stream beds below aquaculture discharges. The reality of aquaculture operations is that the most direct and least expensive approach to controlling pollution is through the pollution prevention inherent in best management practices and efficient operations.

The general permit requires the maintenance of an annual report of the previous year's operational log on site at the facility to support EPA and IDHW-DEQ inspectors as well as permittees in understanding the management practices utilized at a facility. The Permit also requires that a permittee shall provide a copy of an annual report of the operational log upon request by EPA or IDHW-DEQ.

5.5 Quality assurance requirements

The permittees are required to prepare and comply with a quality assurance plan. The primary purpose of the quality assurance plan is to assist in planning for the collection and analysis of samples to ensure that data are reliable.

The permittees are required to follow specific sampling procedures (EPA approved quality assurance, quality control, and chain-of-custody procedures described in Interim Guidelines and Specifications For Preparing Quality Assurance Project Plans; Requirements for Quality Assurance Project Plans; Guidance on Quality Assurance Project Plans) throughout all sample collection and analysis activities to ensure quality data are collected.

6 BEST MANAGEMENT PRACTICES

It is the national policy that, whenever feasible, pollution should be prevented or reduced at the source, that pollution which cannot be prevented should be recycled in an environmentally safe manner, that pollution which cannot be prevented or recycled should be treated in an environmentally safe manner, and that disposal or release into the environment should be employed only as a last resort and should

be conducted in an environmentally safe manner [Pollution Prevention Act of 1990, 42 U.S.C. § 13101 et seq.]. This policy and 40 CFR §122.44(k) form the basis for the Permit requirement that the permittee develop and implement a best management practices (BMP) operating plan.

BMPs are practices that are designed to minimize the volume of pollutants that must be treated. The most important and cost-effective method of controlling the pollutants generated and discharged by an aquaculture facility is the efficient operation of the facility (Phillips et al. 1993, Kendra 1991, Stechey and Trudell 1990, Wester 1989). In developing its BMP operating plan, the permittee will analyze all processes and activities at the facility to determine the potential for a release of pollutants due to that activity and ways to minimize that potential. For the aquaculture industry, typical BMPs include the use of demand feeders, the use of floating feed, and the use of re-aeration water falls when possible.

The Permit requires that a permittee develop a plan and implement BMPs within 90 days after receiving authorization to discharge under this Permit. EPA has developed a general handbook to assist aquaculturists in identifying and utilizing BMPs and in developing and implementing materials accounting and BMP Plans (EPA 1993). IDHW-DEQ and the Idaho Aquaculture Association have developed guidance principles and practices for the management and operation of aquaculture facilities (IDHW-DEQ, 1997).

The BMP operating plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

7 SUMMARY OF EFFLUENT LIMITATIONS, MONITORING AND OTHER CONDITIONS

The discharges of Idaho aquaculture facilities and associated, on-site fish processors covered by the Permit will not result in a violation of the Idaho Water Quality Standards, provided that the permittee complies with the limits and conditions in the Permit. The Permit requires that the permittees comply with Idaho Water Quality Standards as described in Table 2 below.

Table 2. Summary of parameters, permit conditions, basis for permit conditions, and legal reference.

Parameter	Permit Condition(s)	Basis for Permit Condition(s)	Reference Citation(s)
ammonia	Limited for sewage; Monitoring for all	Water quality	IDAPA 16.01.02.250.02.c.iii
biochemical oxygen demand (BOD5)	Limited for fish processing and sewage; Monitoring for all; BMPs	Water quality; Technology	IDAPA 16.01.02.200.07; 40 CFR 408.15, 40 CFR 408.185
biological wastes, e.g., dead fish	No discharge above 2 cm for aquaculture; Monitoring; BMPs. No discharge above 5 mm for fish processing	Water quality	IDAPA 16.01.02.200.05
deleterious materials	No discharge in degrading amounts; Monitoring of whole effluent toxicity; Sediment study; BMPs	Water quality	IDAPA 16.01.02.200.03
dissolved oxygen	Limited for aquaculture, fish processing and sewage using a Mixing Zone; Monitoring of DO, BOD5; BMPs	Water quality	IDAPA 16.01.02.250.02.c.i
fecal coliform (FC)	Limited for sewage; Monitoring	Water quality	IDAPA 16.01.02.250.01.a
feed	Not limited; Monitoring for aquaculture; BMPs	Water quality	40 CFR 122.44
floating, suspended or submerged matter	No discharge above 2 cm for aquaculture. No discharge above 5 mm for fish processing. Monitoring of TSS for all; BMPs	Water quality	IDAPA 16.01.02.200.05
flow	Monitoring influent flow(s) and effluent flow(s)	Water quality	40 CFR 122.44
nutrients, phosphorus	Limited for aquaculture; Monitoring for all; BMPs	Water quality	IDAPA 16.01.02.200.06
nutrients, nitrogen	Not limited; Monitoring; BMPs	Water quality	IDAPA 16.01.02.200.06
oil and grease	Limited for fish processing; Monitoring; BMPs	Technology	40 CFR 408.15, 40 CFR 408.185

Table 2 (continued). Summary of pollutant parameters, permit conditions, basis for permit conditions, and legal reference.

Pollutant Parameter	Permit Condition(s)	Basis for Permit Condition(s)	Reference Citation(s)
oxygen-demanding materials	Limited for fish processing and sewage; Monitoring of BOD5 for all; Sediment study; BMPs	Water quality	IDAPA 16.01.02.200.07
pH	Limited for aquaculture (settling basins), fish processing and sewage; Monitoring for all; BMPs	Water quality, Technology	IDAPA 16.01.02.250.02.a.i; 40 CFR 408.15, 40 CFR 408.185, 40 CFR 133
production	Limitations and Monitoring for aquaculture	Water quality	40 CFR 122.44
residual disease control drugs and other chemicals	Limitations and Monitoring of whole effluent toxicity; BMPs	Water quality	IDAPA 16.01.02.200.02
residual disinfectants	Limitations and Monitoring of whole effluent toxicity; BMPs	Water quality	IDAPA 16.01.02.200.02
residual feed and nutritional supplements	Limitations and Monitoring of TSS for aquaculture; Sediment study; BMPs	Water quality	IDAPA 16.01.02.200.05, .06, .07
settleable solids (SS)	Limited for aquaculture and fish processing; Monitoring of SS; Sediment study; BMPs	Water quality, Technology	IDAPA 16.01.02.200.05, .06, .07, .08 EPA/JRB 1984
sediment	Limitations and Monitoring of TSS for aquaculture; Sediment study	Water quality	IDAPA 16.01.02.200.08
temperature	Monitoring for all; BMPs	Water quality	IDAPA 16.01.02.250.02.c.ii
total residual chlorine (TRC)	Limited for fish processing and sewage; Monitoring	Water quality	IDAPA 16.01.02. 250.02.a.iii

total suspended solids (TSS)	Limited for aquaculture, fish processing and sewage; Monitoring; Sediment study; BMPs	Technology	40 CFR 408.15, 40 CFR 408.185, 40 CFR 133, EPA/JRB 1984
toxic substances	Limitations and Monitoring of whole effluent toxicity; BMPs	Water quality	IDAPA 16.01.02.200.02
turbidity	Limitations; not monitored	Water quality	IDAPA 16.01.02.c.iv

8 OTHER REQUIREMENTS

8.1 Endangered Species Act [16 U.S.C. § 1531 et al.]

Section 7 of the Endangered Species Act requires federal agencies to request a consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects a federal action such as permitting may have on listed endangered species.

In letters dated February 25 and May 20, 1997, the U.S. Fish and Wildlife Service (USFWS) identified the following federally-listed endangered and threatened species in the Middle Snake River watershed:

Endangered Species:

- Gray wolf (*Canis lupus*) - experimental
- Utah valvata snail (*Valvata utahensis*)
- Snake River physa snail (*Physa natricina*)
- Banbury Springs limpet (*Lanx sp.*)
- Idaho spring snail (*Pyrgulopsis idahoensis*)

Threatened Species:

- Bald eagle (*Haliaeetus leucocephalus*)
- Bliss Rapids snail (*Taylorconcha serpenticola*)
- Ute ladies' tresses (*Spiranthes diluvialis*)

In addition to these species, the USFWS has listed several species of concern: kit fox (*Vulpes velox*), white sturgeon (*Acipenser transmontanus*), Shoshone sculpin (*Cottus greenei*), California floater (*Anodonta californiensis*), and Columbia pebble snail (*Fluminicola columbianus*).

In a letter dated June 17, 1997, the USFWS indicated that the following threatened or endangered species may be present in the listed counties (exclusive of the Middle Snake watershed) which have discharging aquaculture facilities.

County	Endangered Species						
	Gray wolf (*Canis lupus*)	Peregrine falcon (*Falco peregrinus anatum*)	Whooping crane (*Grus americana*)	Selkirk Mountains Woodland caribou (*Rangifer tarandus caribou*)	Sockeye salmon (*Oncorhynchus nerka*)	Utah valvata snail (*Valvata utahensis*)	Snake River physa snail (*Physa natricina*)
Bannock	X	X	X				
Bear Lake	X	X	X				
Bingham	X						
Blaine	X						
Bonner	X			X			
Canyon	X	X					
Caribou	X	X	X				
Clearwater	X						
Custer	X	X			X		
Fremont	X	X	X				
Idaho	X	X			X		
Minidoka	X					X	X
Power	X					X	
Valley	X	X					

County	Threatened Species						
	Bald eagle (*Haliaeetus leuco-cephalus*)	Bliss Rapids Snail (*Taylorconcha serpenticola*)	Ute ladies tresses (*Spiranthes diluvialis*)	Grizzly Bear (*Ursus arctos horribilis*)	Water howellia (*Howellia aquatilis*)	Chinook salmon (*Oncorhynchus tshawytscha*)	Macfarlane's four-o'clock (*Mirabilis macfarlanei*)
Bannock	X	X	X				
Bear Lake	X		X				
Bingham	X	X	X				
Blaine	X	X	X				
Bonner	X			X			
Canyon	X						
Caribou	X		X				
Clearwater	X			X	X		
Custer	X					X	
Fremont	X		X	X			
Idaho	X				X	X	X
Minidoka	X	X	X				
Power	X	X	X				
Valley	X					X	

EPA is currently consulting with USFWS under section 7 of the Endangered Species Act regarding the impact of this Permit on the listed species as part of a consultation on permitted discharges to the Middle Snake River. EPA is preparing a biological evaluation analyzing the effects of these permits on listed species.

With respect to phosphorus, EPA has determined that the limits in the general permit protect listed species and species of concern, particularly those in the Middle Snake watershed. The proposed permit will improve water quality by significantly reducing phosphorus loads to the Middle Snake, which will in turn reduce eutrophication.

The Permit contains limits on both settleable and suspended solids to control the discharge of oxygen-demanding organic solids to the receiving water and subsequent deposition to stream beds. According to the *Middle Snake Watershed Management Plan* (IDHW-DEQ, 1997), anoxic sediments exist below the outfalls of many hatcheries.

There are no data to determine whether these anoxic and hypoxic sediments are due to historic discharges or are an ongoing problem that is not being controlled by current permit limits. Therefore, EPA has determined that the sediment discharges from the aquaculture facilities *may* adversely affect listed snails. In order to determine effect on the Middle Snake River, the Permit includes sediment monitoring by the largest facilities discharging to the Middle Snake River or its tributaries to assess whether or not more stringent limits are needed to control solids discharges. If monitoring shows that more stringent limits are necessary, the Permit may be reopened to establish these limits.

Chemicals in discharges from aquaculture facilities may include disease control chemicals, drugs, or disinfectants. These pollutants could cause acute or chronic toxicity to aquatic life in the receiving water. There are currently no data available to determine the toxicity of these chemicals to aquatic life, including the snails listed under ESA. Therefore, EPA has determined that the discharge of chemicals by the aquaculture facilities covered under the general permit may adversely affect listed snails. In order to determine the effect on aquatic life and the habitat of the Middle Snake River, the Permit includes whole effluent toxicity (WET) testing during the use of chemicals used in disease and algal control at aquaculture facilities. WET testing would determine the potential of the aquaculture effluents to cause or contribute to an instream excursion above the State's water quality criteria for toxic substances.

In addition, EPA is requiring all permittees to submit information regarding frequency, timing, and type of chemical use. The data submitted after the first year of Permit issuance will be used to determine the need for WET testing, and, if needed, the specific WET testing requirements. The thirteen largest facilities

would conduct testing in a coordinated fashion. Each facility would be required to collect effluent samples for testing during the time when the chemicals of concern are expected to be in the effluent. Testing would include one set of tests using water from the receiving stream and one set using effluent from the facilities. For those facilities with influent water from streams, canals, or rivers, testing would also include one set using influent water.

This approach would enable EPA to determine whether any observed toxicity is due to addition of chemicals by the facility to the receiving water or whether it is due to pesticides or other toxicants in the receiving water, or influent water, from upstream. The chemical usage information and toxicity test data will be used to determine whether further testing and/or limits are needed for large or small facilities. The Permit may be reopened to establish these testing requirements and/or limits.

Facilities which discharge to the habitat of fish listed under ESA are not authorized to discharge under this Permit. However, authorization may be sought by these facilities through a request for a waiver. The request must include a description of why the discharges from the facility would not adversely affect any listed threatened and endangered species. This information would be used in subsequent, site-specific consultation with USFWS regarding the impact on listed species of issuing the Permit to the requesting facility.

8.2 Wild and Scenic Rivers Act [16 U.S.C. § 1273 et seq.]

Section 1 of the Wild and Scenic Rivers Act declares that rivers designated as wild or scenic and their immediate environs shall be protected for the benefit and enjoyment of present and future generations. The Permit excludes Idaho's river reaches designated as "wild" or "scenic" from coverage under the Permit. EPA has determined that the pollutants discharged to these waters should not exceed ambient background concentrations prior to discharge. This constitutes a rigorous application of the State's anti-degradation policy. Although EPA believes that this Permit meets the State's criteria for the protection of the aquatic life beneficial use, it may not be adequate to prevent degradation of protected, special, or at-risk water resources.

8.3 Water Quality Standards and State Certification of the Permit

Since this Permit authorizes discharge to State waters, the provisions of Section 401 of the Act apply. Section 401 of the Act requires that states certify that federally issued permits are in compliance with state law. No permits can be issued until the requirements of this section are satisfied.

EPA is requesting State officials to review and provide appropriate certification to this draft general NPDES permit pursuant to 40 CFR § 124.53. Furthermore, in accordance with 40 CRF §124.10(c)(1), public notice of the Permit has been

provided to the State of Idaho and State agencies having jurisdiction over fish, shellfish and wildlife resources.

8.4 Presidential oversight of federal regulations [Executive Order 12866]

The Office of Management and Budget has exempted this action from the review requirements of Executive Order 12866 providing for presidential oversight of the regulatory process pursuant to Section 6 of that order.

8.5 Paperwork Reduction Act [44 U.S.C. § 3501 et seq.]

EPA has reviewed the requirements imposed on regulated facilities in the Permit under the Paperwork Reduction Act. The information collection requirements have been approved by the Office of Management and Budget (OMB) in submissions made for the NPDES permit program and the previous NPDES permits for aquaculture facilities and fish processors in Idaho.

8.6 The Regulatory Flexibility Act [5 U.S.C. § 601 et seq.]

EPA has concluded that NPDES general permits are permits under the Administrative Procedure Act (APA), 5 U.S.C. § 551 et seq., and thus not subject to APA rulemaking requirements or the Regulatory Flexibility Act.

8.7 General provisions

Part 122 of Title 40 of the Code of Federal Regulations provides specific regulatory requirements and conditions for NPDES permits. These conditions are included in the Permit as recording and reporting requirements (Part VI), compliance responsibilities (Part VII), and other general permit provisions (Part VIII). The language of the regulations is literally used within the Permit to specify these conditions.

9 DEFINITIONS AND ACRONYMS

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative (40 CFR 122.2).

Aquaculture facility means a hatchery, fish farm, or other facility which contains, grows, or holds fish for later harvest (or process) and sale or for release for conservation enhancement purposes.

Average monthly discharge means the highest allowable average of “daily discharges” over a calendar month, calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month. It may also be referred to as the "monthly average discharge"(40 CFR 122.2).

Beneficial use means any of the various uses which may be made of the water of Idaho, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics (IDAPA 16.01.02.003.04).

Best Management Practices (BMP) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States”. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage of raw material storage (40 CFR 122.2).

BMPs mean “best management practices.”

Biochemical oxygen demand means the measure of the amount of oxygen necessary to satisfy the biochemical oxidation requirements of organic materials at the time the sample is collected; unless otherwise specified, this term will mean the five (5) day BOD incubated at twenty (20) degrees C (BOD5) (IDAPA 16.01.02.003.11).

BOD means “biochemical oxygen demand.”

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

CFR means the Code of Federal Regulations.

cfs means cubic feet per second.

Composite sample means a flow-proportioned mixture of not less than four discrete representative samples.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, 33 U.S.C. 1251 et seq. (40 CFR 122.2).

Daily discharge means the “discharge of a pollutant” measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limits expressed as mass "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day (40 CFR 122.2).

Deleterious material means any nontoxic substance which may cause the tainting of edible species of fish, taste and odors in drinking water supplies, or the reduction of the usability of water without causing physical injury to water users or aquatic and terrestrial organisms (IDAPA 16.01.02.003.20).

The *Director* means the Regional Administrator of EPA.

Discharge when used without qualification means the “discharge of a pollutant.”

Discharge Monitoring Report means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees (40 CFR 122.2).

Discharge of a pollutant means:
(a) Any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or
(b) Any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.
This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any “indirect discharger” (40 CFR 122.2).

Disinfectant means any chemical used to reduce pathogenic or objectionable organisms, including but not limited to algicides, fungicides, and pesticides.

Disinfection means any method of reducing the pathogenic or objectionable organisms by means of chemical application or other acceptable means.

Dissolved oxygen (DO) means the measure of the amount of oxygen dissolved in the water, usually expressed in mg/L (IDAPA 16.01.02.003.29).

DMR means “Discharge Monitoring Report” (40 CFR 122.2).

Domestic wastes means materials discharged from showers, sinks, safety showers, hand-wash stations, galleys, and laundries.

Draft permit means a document prepared under 40 CFR 124.6 indicating the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a “permit” (40 CFR 122.2).

Effluent means any wastewater discharged from a treatment facility (IDAPA 16.01.02.003.32).

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of “pollutants” which are “discharged” from “point sources” into “waters of the United States,” the waters of the “contiguous zone,” or the ocean (40 CFR 122.2).

Effluent limitations guidelines means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise “effluent limitations.' (40 CFR 122.2).

EPA means the United States Environmental Protection Agency.

Excluded area means an area not authorized as a receiving water covered under this general NPDES permit.

Fecal coliform means the portion of the coliform group of bacteria present in the gut and feces of warm-blooded animals, usually expressed as number of organisms/one hundred (100) ml of sample (IDAPA 16.01.02.003.37).

Flow-proportioned means proportioned according to rate of influent and effluent. In the context of sampling influent and effluent quality and in the case of multiple influent points or effluent discharge points, the sample volume from each of the influent points, or effluent discharge points, shall be apportioned according to the flow at the time of sampling at the specific influent, or effluent, point.

General permit means an NPDES “permit” issued under Sec. 122.28 authorizing a category of discharges under the CWA within a geographical area. (40 CFR 122.2)

Grab sample means a single sample or measurement taken at a specific time.

Gray water means kitchen, bath and shower wastewater.

Hazardous material means a material or combination of materials which, when discharged in any quantity into state waters, presents a substantial present or potential hazard to human health, the public health, or the environment (IDAPA 16.01.02.003.44).

Influent means the point(s) where the water enters the facility or settling pond(s).

Land application means a process or activity involving applications of wastewater, surface water, semi-liquid material, solid wastes, biosolids, sludge, or solids to the land surface for the purpose of disposal, pollutant removal, ground water recharge, conditioning the soil, or fertilizing crops or other vegetation grown in the soil.

Loading allocation means the greatest amount of pollutant loading that a water can receive without violating water quality standards (IDAPA 16.01.02.003.53).

Man-made waterways means canals, flumes, ditches, and similar features constructed for the purpose of water conveyance (IDAPA 16.01.02.003.57).

mg/L means milligrams of solute per liter of solution, equivalent to parts per million, assuming unit density (IDAPA 16.01.02.003.58).

Maximum means the highest measured discharge or pollutant in a waste stream during the time period of interest.

Maximum daily discharge limitation means the highest allowable “daily discharge” (40 CFR 122.2).

Mixing zone means a defined area or volume of the receiving water surrounding or adjacent to a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria or standards. It is considered a place where wastewater mixes with receiving water and not as a place where effluents are treated (IDAPA 16.01.02.003.59).

ml/L means milliliters per liter.

Monthly average means the average of “daily discharges” over a monitoring month, calculated as the sum of all “daily discharges” measured during a monitoring month divided by the number of “daily discharges” measured during that month (40 CFR 122.2).

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA (40 CFR 122.2).

Net mg/L means the difference between influent concentration and effluent concentration.

NOI means Notice of Intent.

Notice of Intent (NOI) means a request, or application, to be authorized to discharge under a general NPDES permit.

NPDES means “National Pollutant Discharge Elimination System.”

Nuisance means anything which is injurious to the public health or an obstruction to the free use, in the customary manner, of any waters of the State (IDAPA 16.01.02.003.65).

Nutrients means the major substances necessary for the growth and reproduction of aquatic plant life, consisting of nitrogen, phosphorus, and carbon compounds (IDAPA 16.01.02.003.66).

Off-line settling basin or pond means a constructed retention basin that receives wastewater from an aquaculture facility for the retention and treatment of wastewater through settling of solids and around which such wastewaters can be directed during periods of solids removal.

OMB means the U.S. Office of Management and Budget.

Outstanding resource water means a high quality water, such as water of national and state parks and wildlife refuges and water of exceptional recreational significance. ORW constitutes as outstanding national or state resource that requires protection from point and nonpoint source activities that may lower water quality (IDAPA 16.01.02.003.70).

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (40 CFR 122.2).

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

Production means the amount of fish harvested, processed or released in a given period of time.

Sanitary wastes means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes.

Schedule of compliance means a schedule of remedial measures included in a "permit", including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations (40 CFR 122.2).

Secondary treatment means processes or methods for the supplemental treatment of wastewater, usually following primary treatment, to affect additional improvement in the quality of the treated wastes by biological means of various types which are designed to remove or modify organic matter (IDAPA 16.01.02.003.89).

Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

Sewage means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes.

Special resource water means those specific segments or bodies of water which are recognized as needing intensive protection to preserve outstanding or unique characteristics or to maintain current beneficial use (IDAPA 16.01.02.003.95).

Technology-based permit effluent limitation means wastewater treatment requirements under Section 301(b) of the Clean Water Act that represent the minimum level of control that must be imposed in a permit issued under Section 402 of the Clean Water Act (IDAPA 16.01.02.003.102).

TMDL means total maximum daily load.

Total maximum daily load (TMDL) means the sum of the individual wasteload allocations for points sources, load allocations for nonpoint sources, and natural background. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality (IDAPA 16.01.02.003.103).

Toxic substance means any substance, material or disease-causing agent, or a combination thereof, which after discharge to waters of the State and upon exposure, ingestion, inhalation or assimilation into any organism (including humans), either directly from the environment or indirectly by ingestion through food chains, will cause death, disease, behavioral abnormalities, malignancy, genetic mutation, physiological abnormalities (including malfunctions in reproduction) or physical deformations in affected organisms or their offspring. Toxic substances include, but are not limited to, the one hundred twenty-six (126) priority pollutants identified by EPA pursuant to Section 307(a) of the Clean Water Act (IDAPA 16.01.02.003.105).

TP means total phosphorus, of which the concentration in water is measured in mg/L.

TSS means total suspended solids, of which the concentration in water is measured in mg/L.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance.

Outstanding resource water means a high quality water, such as water of national and state parks and wildlife refuges or careless or improper operation (see Part IV.H.).

U.S.C. means United States Code.

USGS means the United States Geologic Survey.

Waiver means the intentional relinquishment of a right, claim, or privilege.

Water pollution means any alteration of the physical, thermal, chemical, biological, or radioactive properties of any waters of the State, or the discharge of any pollutant into the waters of the States, which will or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to fish and wildlife, or to domestic, commercial, industrial, recreational, aesthetic, or other beneficial uses (IDAPA 16.01.02.003.113).

Water quality-based effluent limitation means an effluent limitation that refers to specific levels of water quality that are expected to render a body of water suitable for its designated or existing beneficial uses (IDAPA 16.01.02.003.113).

Warm water aquaculture animals include, but are not limited to, the *Ictaluridae*, *Centrarchidae, Cyprinidae*, and *Cichlidae* families of fish, e.g., respectively, catfish, sunfish, minnow, and tilapias.

Waters of the United States or waters of the U.S. means:
(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(b) All interstate waters, including interstate "wetlands;"
(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
(3) Which are used or could be used for industrial purposes by industries in interstate commerce;
(d) All impoundments of waters otherwise defined as waters of the United States under this definition;
(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
(f) The territorial sea; and
(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition (40 CFR 122.2).

Whole effluent toxicity means the aggregate toxic effect of an effluent measured directly by a toxicity test (40 CFR 122.2).

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11 APPENDIX A: Development of Phosphorus Limits from Waste Load Allocations for the Middle Snake River Watershed

The wasteload allocation (WLA) for each of the largest aquaculture facilities discharging in the Middle Snake watershed was provided in the Middle Snake TMDL. The average monthly limit and the maximum daily limit derived from the WLA are provided in Appendix I (Part X.B.1.) of the Permit.

In translating the WLAs into permit limits, EPA followed the procedures in its *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991). The first step in developing limits is to determine the time frame over which the WLAs apply. In general, the period over which a criterion applies is based on the length of time the target organism can be exposed to the pollutant without adverse effect. For example, aquatic life criteria generally apply as one-hour averages (acute criteria) or four-day averages (chronic criteria). In the case of total phosphorus, the target organisms are aquatic vegetation which responds to high phosphorus concentrations with excess growth, resulting in eutrophication. The period over which this effect occurs is uncertain. However, EPA believes that applying the WLAs as monthly averages is appropriate.

The WLAs must then be statistically converted to average monthly and maximum daily permit limits. In this case, because the averaging period for the pollutant is monthly, no conversion is necessary and the monthly average permit limits are equal to the WLAs. Derivation of the daily maximum permit limit from the monthly average limit is based in part on the coefficient of variation (CV) for the effluent at each facility. EPA believes that phosphorus in entrained in effluent as both dissolved and suspended phases and that the variation in the amount of phosphorus is relatively stable with a CV of 0.2. EPA invites permittees to submit data on phosphorus concentrations which meets federal quality assurance guidelines in order to provide a more definitive basis for the determination of the coefficient of variation for this pollutant.

The MDL is calculated by multiplying the AML by the following relationship (see Technical Support Document for Water Quality-based Toxics Control, EPA 1991, Table 5-3):

$$MDL/AML = (\exp(Z_m\sigma - 0.5\sigma^2))/(\exp(Z_a\sigma - 0.5\sigma^2/n))$$

where:

Z_m = percentile exceedance probability for MDL (99%) = 2.326

Z_a = percentile exceedance probability for AML (95%) = 1.645

$$\sigma^2 = \ln(CV^2/n + 1)$$

$$\sigma^2 = \ln(CV^2 + 1)$$

CV = the coefficient of variation of the effluent concentration, standard deviation divided by the mean (see below for calculation) = 0.2

n = the number of samples per month = 4

Therefore: MDL/AML =1.33

MDL = 1.33 X AML lbs/day = MDL lbs/day

See Appendix I (Part X.B.1.) of Permit for MDLs