Fact Sheet

Public Comment Start Date: February 16, 2007
Public Comment Expiration Date: April 17, 2007

Technical Contact: Brian Nickel
206-553-6251
800-424-4372, ext. 6251 (within Alaska, Idaho, Oregon and Washington)
Nickel.Brian@epa.gov

Proposed Reissuance of a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA)

City of Coeur d'Alene
Wastewater Facility

EPA Proposes To Reissue NPDES Permit
EPA proposes to reissue an NPDES permit to the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

401 Certification
EPA is requesting that the Idaho Department of Environmental Quality certify the NPDES permit for this facility, under section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Regional Administrator
Idaho Department of Environmental Quality
2110 Ironwood Pkwy
Coeur d'Alene, ID 83814

Public Comment
Persons wishing to comment on the tentative determinations contained in the draft permit may do so in writing to the above address or by e-mail to "Nickel.Brian@epa.gov" within 60 days of the date of this public notice. Comments must be received within the 60 day period to be considered in the formulation of final determinations regarding the applications. All comments should include the name, address and telephone number of the commenter and a concise statement of the exact basis of any comment and the relevant facts upon which it is based. All written comments and requests should be submitted to EPA at the above address to the attention of the Director, Office of Water and Watersheds.

Workshop and Public Hearing
A workshop and public hearing will be held.

Date: April 4, 2007
Time: Workshop from 5:00 PM to 7:00 PM
Public hearing from 7:00 PM to 9:00 PM
Place: Lake City Senior Center
1916 North Lakewood Drive
Coeur d'Alene, ID 83814

Comments made on the draft permits at the public hearing will become part of the administrative record for the permits, along with any written comments received.

After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit issuance. If no substantive comments are received, the proposed conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days of the service of notice of the final permit decision.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://epa.gov/r10earth/waterpermits.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-6251 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Pkwy
Coeur d'Alene, ID 83814
208-799-4370
1-877-541-3304

Post Falls Library
821 North Spokane Street
Post Falls, ID 83854
208-773-1506

Hayden Lake Library
8385 North Government Way
Hayden, ID 83835
208-772-5612, ext. 11

U.S. Environmental Protection Agency
Idaho Operations Office
1435 North Orchard
Boise, ID 83706
208-378-5748

U.S. Environmental Protection Agency
Coeur d’Alene Field Office
1910 Northwest Blvd., Suite 208
Coeur d’Alene, ID 83814
208-665-0458

Washington State Department of Ecology
Eastern Regional Office
4601 North Monroe Street, Suite 202
Spokane, WA 99205-1295
509-329-3400

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IDEQ	Idaho Department of Environmental Quality
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OW	Office of Water
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan

RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. Applicant

This fact sheet provides information on the draft NPDES permit for the following entity:

City of Coeur d'Alene
NPDES Permit # ID-002285-3

Mailing Address:
710 East Mullan Avenue
Coeur d'Alene, ID 83814

Physical Address:
915 Hubbard Avenue
Coeur d'Alene, ID 83814

Contact:
Sid Fredrickson, Superintendent

II. Facility Information

The City of Coeur d'Alene owns, operates and maintains the Coeur d'Alene Wastewater Facility. The wastewater facility was one of the first secondary treatment wastewater treatment plants in the world, originally constructed in 1939. Some parts of the original 1939 treatment plant are still operational, notably one of the primary clarifiers. The first NPDES permit was issued to the City of Coeur d'Alene Wastewater Treatment Plant on March 27, 1974.

The facility provides secondary treatment, phosphorus removal, and disinfection of domestic and industrial wastes prior to discharge to the Spokane River. The current average design flow of the facility is 6.0 million gallons per day (mgd). Based on data submitted by the permittee, the average flow rate over the past five years has been 3.2 mgd, and the maximum effluent flow rate was 4.62 mgd.

Details about the wastewater treatment processes and waste streams are included in Appendix A. See Appendix B for a map of the location of the treatment plant and discharge.

An NPDES permit was issued to the facility on September 30th, 1999, and it expired on November 2, 2004. A modification to the 1999 permit became effective on May 13, 2004. The permittee submitted a timely and complete application for renewal of its NPDES permit, which EPA received on April 30, 2004. The modified 1999 permit has been administratively continued under 40 CFR 122.6 and remains fully effective and enforceable until the permit can be reissued.

III. Receiving Water

This facility discharges to the Spokane River in Kootenai County, Idaho. The outfall location is between the outlet of Lake Coeur d'Alene and the Post Falls Dam, about one-half mile upstream of the US Highway 95 bridge at river mile 110.2.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the Idaho WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. However, because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based design flow intended to ensure an excursion frequency of less than once every three years for a 30-day average flow rate.

Because there are significant seasonal variations in the flow rate of the Spokane River, EPA has elected to calculate the 1Q10, 7Q10 and 30B3 on a seasonal basis. EPA has used flow data from USGS Gauging Station #12419000 (Spokane River at Post Falls Dam) to calculate the 1Q10, 7Q10, and 30B3 flow rates. The period of record for these calculations was 1974-2004. EPA used the DFLOW 3 computer program to perform the receiving water design flow calculations[1].

Table 1: Seasonal Low Flows in the Spokane River

Season	1Q10 (CFS)	7Q10 (CFS)	30B3 (CFS)
November through March	901	1020	1490
April through June	2040	2500	4420
July through October	196	295	377

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (Act) requires that NPDES permits contain effluent limits more stringent than technology-based limits when necessary to meet water quality standards. A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as cold water aquatic life, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses. At the point of discharge, the Spokane River is protected for the following designated uses (IDAPA 58.01.02.110.12):

- cold water aquatic life habitat
- salmonid spawning
- primary contact recreation
- domestic water supply

[1] The latest version of DFLOW can be downloaded from the EPA website at the following address: http://epa.gov/waterscience/dflow/

In addition, the Idaho Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c.), wildlife habitats (100.04) and aesthetics (100.05).

Primary contact recreation is defined by the Idaho Water Quality Standards as "water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to swimming, water skiing, or skin diving."

The Spokane River also has site-specific criteria for ammonia (IDAPA 58.01.02.283). The site-specific ammonia criteria are identical to the statewide ammonia criteria for waters designated for cold water aquatic life when early life stages of fish are present (IDAPA 58.01.02.250.02.d.).

The City of Coeur d'Alene wastewater treatment plant outfall is located approximately 14 river miles upstream from the Washington border. Federal regulations at 40 CFR 122.4(d) require that NPDES permits include conditions necessary to ensure compliance with the water quality requirements of all affected States. Therefore it is necessary to determine if the discharge has the reasonable potential to cause or contribute to nonattainment of Washington's water quality standards, in addition to Idaho's water quality standards. If the discharge has the reasonable potential to cause or contribute to nonattainment of Washington's water quality standards, effluent limits must be derived from and comply with Washington's water quality standards, in addition to Idaho's water quality standards.

The segment of the Spokane River between the Nine Mile Bridge (river mile 58.0) and the Washington-Idaho state line (river mile 96.0) is classified in the *Water Quality Standards for Surface Waters of the State of Washington* (Washington Administrative Code 173-201A-130[2]) as a "Class A" waterbody, with a site-specific temperature criterion of 20ºC. Lake Spokane, a reservoir formed by the Long Lake Dam on the Spokane River, is a "Lake Class" waterbody. Characteristic uses of Class A and Lake Class waterbodies in the State of Washington include, but are not limited to:

- domestic, industrial and agricultural water supply;
- stock watering;
- migration, rearing, spawning and harvesting of salmonids and other fish;
- wildlife habitat;
- recreation including primary contact recreation, sport fishing, boating, and aesthetic enjoyment; and
- commerce and navigation

Table 2 (below) compares the water quality criteria for the Spokane River in Idaho and Washington. Note that some of Washington's water quality criteria are more stringent than Idaho's.

[2] This and all citations of the *Water Quality Standards for Surface Waters of the State of Washington* refer to the most recent approved version of those standards, which, at this time, is the version dated November 18, 1997.

Table 2: Water Quality Criteria for the Spokane River and Lake Spokane		
Spokane River		
Parameter	**Idaho Criterion**	**Washington Criterion**
pH	6.5 to 9.0 standard units	6.5 to 8.5 standard units with a human-caused variation within the above range of less than 0.5 units
Dissolved Oxygen	Concentrations exceeding 6.0 mg/L at all times	Dissolved oxygen shall exceed 8 mg/L. If natural conditions are less than the criteria, the natural conditions shall constitute the water quality criteria.[1,2]
Lake Spokane (Washington Water Quality Standards)		
Dissolved Oxygen	No measurable decrease from natural conditions.[1,2]	
Notes: 1. For dissolved oxygen, the Washington State Department of Ecology (Ecology) has interpreted a "measurable decrease" from natural conditions to be a 0.2 mg/L decrease from natural conditions (Cusimano, 2004). 2. The *Water Quality Standards for Surface Waters of the State of Washington* (173-201A WAC) define "natural conditions" as the surface water quality that was present before any human-caused pollution.		

C. Water Quality Limited Segment

A water quality limited segment is any waterbody, or definable portion of a waterbody, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. In accordance with section 303(d) of the Clean Water Act, States must identify waters not achieving water quality standards in spite of the application of technology-based controls in National Pollutant Discharge Elimination System (NPDES) permits for point sources. Such waterbodies are known as water quality limited segments (WQLSs), and the list of such waterbodies is called the "303(d) list." Once a water body is identified as a WQLS, the States are required under the Clean Water Act to develop a total maximum daily load (TMDL). A TMDL is a determination of the amount of a pollutant, or property of a pollutant, from point, nonpoint, and natural background sources (including a margin of safety) that may be discharged to a water body without causing the water body to exceed the water quality criterion for that pollutant. The Spokane River flows through Idaho and Washington, and various segments of the river are water quality limited in both States

Metals (Idaho)

The segment of the Spokane River to which the City of Coeur d'Alene discharges was listed in Idaho's 1998 "303(d) list" (i.e. the list of impaired waterbodies prepared and submitted to EPA pursuant to Section 303(d) of the Act) as not attaining or not expected to meet the state water quality standards for metals (specifically cadmium, lead, and zinc). In August of 2000, EPA approved a TMDL submitted by the State of Idaho for metals in the Coeur D'Alene River Basin, which included this segment of the Spokane River. However, in 2003, the Idaho Supreme Court determined that the state issued TMDL was void because it was not promulgated according to the rulemaking requirements of Idaho's Administrative Procedures Act.

Because the State court invalidated the Coeur d'Alene River Basin TMDL under State law, there is no longer an EPA approved TMDL for the relevant section of the Spokane River. Accordingly, EPA is not required by 40 CFR 122.44(d)(1)(vii)(B) to establish water quality-based effluent limits that are consistent with the assumptions and requirements of the invalidated TMDL's wasteload allocations. Any such effluent limits, however, must be derived from, and comply with, applicable water quality standards (40 CFR 122.44(d)(1)(vii)(A)).

In the absence of an approved TMDL for the Idaho reach of the Spokane River for metals, EPA established "criteria end-of-pipe" water quality-based effluent limits for zinc in the 1999 permit, as modified effective May 13, 2004. This means that no mixing zone was allowed for zinc and the discharge was required to meet water quality criteria for zinc before the effluent was discharged to the receiving water. Criteria end-of-pipe effluent limits are retained in the current draft of the permit. A reasonable potential analysis showed that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for cadmium or lead (once again applying criteria at the end-of-pipe); therefore the draft permit does not contain effluent limits for cadmium or lead.

The numeric values of the acute and chronic water quality criteria for cadmium, lead, zinc, and certain other metals are dependent upon the hardness of the water. For the criteria end-of-pipe reasonable potential and effluent limit calculations for cadmium, lead and zinc, the effluent hardness was used to calculate the water quality criteria. As long as the concentrations of cadmium, lead, and zinc in the effluent are below the water quality criteria (calculated at the effluent hardness) the effluent will not cause or contribute to an in-stream excursion above water quality standards.

EPA has determined that a discharge of zinc in compliance with the effluent limits in the 1999 permit (as modified) could cause or contribute to excursions above water quality standards for zinc. This is due to an error in the calculation of the zinc effluent limits in the 2004 modification of the permit. EPA has corrected this error and re-calculated the zinc effluent limits in this permit. The re-calculation resulted in more stringent effluent limits for zinc.

Temperature (Idaho)

The Spokane River is listed in Idaho's 2002/2004 303(d)/305(b) integrated report as being impaired for temperature. The Spokane River is designated for salmonid spawning, a use which is protected by more stringent temperature water quality criteria relative to the cold water aquatic life use. However, these criteria only apply during the period of spawning and incubation for the particular species inhabiting waters with this designated use (IDAPA 58.01.02.250.02.f.). According to the Idaho Department of Fish and Game, spawning does not occur in the Spokane River above the Post Falls Dam (personal communication with Ned Horner, IDFG, 10/13/05). Therefore, EPA has applied cold water aquatic life temperature criteria, rather than salmonid spawning criteria, to the Spokane River at the point of discharge. The cold water aquatic life criteria are a maximum daily average temperature of 19ºC and an instantaneous maximum temperature of 22ºC.

Temperature is generally not a pollutant of concern for municipal wastewater treatment plants. The Idaho Department of Environmental Quality has determined that the elevated temperatures in the Spokane River are due to natural conditions (IDEQ 2000). A reasonable potential analysis has shown that the discharge does not have the reasonable potential to cause or contribute to excursions above Idaho's temperature criteria and has a very small impact on the temperature of the receiving water after mixing (less than 0.3 ºC) (Nickel, 2007b). Therefore, the draft permit does not propose effluent limits for temperature.

Dissolved Oxygen (Washington)

Lake Spokane and segments of the Spokane River between the State line and Lake Spokane are listed in Washington's 2002/2004 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for dissolved oxygen (DO). EPA has evaluated the impact of discharges of nutrients (specifically total ammonia and total phosphorus) and carbonaceous biochemical oxygen demand (CBOD) from point source dischargers to the Spokane River in the State of Idaho on the DO of downstream waters of the State of Washington. EPA has determined that the discharges of these pollutants from the Coeur d'Alene, Hayden Area Regional Sewer Board (HARSB), and Post Falls wastewater treatment plants (WWTPs) have the reasonable potential to cause or contribute to water quality standards nonattainment for dissolved oxygen and pH in the State of Washington. EPA has therefore established water quality-based effluent limits for total phosphorus, total ammonia, and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) that are derived from and comply with Washington's water quality standards. See Appendix C for a more complete discussion of the effluent limits imposed in order to prevent the Idaho point sources from causing nonattainment of Washington's water quality criteria for dissolved oxygen.

Metals (Washington)

The segment of the Spokane River immediately downstream from the State line is listed in Washington's 2002/2004 303(d)/305(b) integrated report for cadmium, lead, and zinc. The listing category for these metals is 4A, which means that a TMDL has been prepared for these pollutants. The *Spokane River Dissolved Metals Total Maximum Daily Load* (Butkus and Merrill, 1999) was approved by EPA on August 25, 1999.

As explained above, when determining whether the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for cadmium, lead and zinc and in calculating water quality-based effluent limits for those metals where the discharge has reasonable potential, Idaho's water quality criteria have been applied at the end-of-pipe. Idaho and Washington have identical water quality criteria for lead, and identical chronic cadmium water quality criteria. Idaho's acute water quality criterion for cadmium is more stringent (numerically less) than Washington's. Because Idaho's water quality criteria for cadmium and lead are at least as stringent as Washington's, the fact that the City of Coeur d'Alene's discharge does not have the reasonable potential to cause or contribute to excursions above Idaho's water quality standards for cadmium or lead also means that the City's discharge does not have the reasonable potential to cause or contribute to excursions above Washington's standards for those metals.

Washington's zinc criteria are marginally more stringent (numerically less) than Idaho's. Washington's acute criterion is 2.4% more stringent than Idaho's and its chronic criterion is 13% more stringent than Idaho's. Since Washington's zinc water quality criteria are more stringent than Idaho's, EPA performed a separate analysis to determine if the combined discharges of zinc from the City of Coeur d'Alene, the City of Post Falls, and the Hayden Area Regional Sewer Board have the reasonable potential to cause or contribute to excursions above Washington's water quality criteria for zinc at the State line.

Zinc excursions would still exist at the State line even if the Idaho dischargers ceased discharging entirely, or discharged no zinc. However, the water quality criteria for zinc become less stringent with increasing hardness. Because the effluents from the three point sources to the Spokane River in Idaho are harder than the receiving water, the Idaho dischargers create loading capacity for zinc (by raising the hardness and in turn the water quality criteria) at the State line. Using available information and conservative assumptions, EPA determined that, by discharging relatively hard water, the three Idaho point sources reduce the magnitude of excursions above zinc water quality standards at the State line. In other words, the Idaho point sources' discharges of relatively hard water to the Spokane River create more zinc loading capacity than they use by discharging zinc. Therefore, the Idaho dischargers do not have the reasonable potential to cause or contribute to excursions above Washington's water quality standards for zinc at the State line, and it is therefore not necessary to impose zinc effluent limits on the Idaho point sources that are more stringent than those necessary to meet Idaho water quality standards at the end-of-pipe (Nickel, 2007a).

Temperature (Washington)

The segment of the Spokane River immediately downstream from the State line is listed in Washington's 2002/2004 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for temperature. The applicable water quality criterion for temperature in Washington is a maximum of 20 ºC. When natural conditions exceed 20 ºC, no temperature increase will be allowed that will raise the receiving water temperature by greater than 0.3 ºC.

The Idaho Department of Environmental Quality has determined that the elevated temperatures observed in the Spokane River are due to natural conditions (IDEQ 2000). EPA has determined that the 95^{th} percentile cumulative temperature change attributable to the three point sources to the Spokane River in Idaho, as predicted by dynamic modeling at the State line under year 2001 receiving water conditions (which were near 10-year low flows), is 0.11 ºC when the river temperature (with zero discharge from the Idaho point sources) is greater than 20 ºC. The average temperature change relative to zero discharge at the State line is zero. Therefore, the Idaho point sources do not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature in the State of Washington.

Total Polychlorinated Biphenyls (Washington and Spokane Tribe of Indians)

The segment of the Spokane River immediately downstream from the State line is listed in Washington's 2002/2004 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for total polychlorinated biphenyls in fish tissue. The Spokane Tribe of Indians has approved water quality standards for its waters, which are downstream of the Long Lake Dam, and data indicate that the Tribe's water quality criterion for PCBs (in the water column) is not being attained.

Currently, there are insufficient data to determine if the discharges from point sources to the Spokane River in Idaho have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Washington or the Spokane Tribe of Indians. Therefore, the draft permits for the Cities of Post Falls and Coeur d'Alene and the Hayden Area Regional Sewer Board propose quarterly effluent monitoring, and annual water column monitoring[3] near the outlet from Lake Coeur d'Alene for total PCBs. These data will be used to determine if the discharges have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Washington or the Spokane Tribe of Indians.

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the Clean Water Act (Act) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards of a waterbody are being met and may be more stringent than technology-based effluent limits. The bases for the proposed effluent limits in the draft permit are provided in Appendices C, D, E, F, and G.

B. Proposed Effluent Limitations

Below are the proposed effluent limits that are in the draft permit.

1. Removal Requirements for $CBOD_5$ and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of $CBOD_5$ and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
2. The permittee must not discharge floating, suspended or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.
3. Table 3 (below) presents the proposed final average monthly, average weekly, maximum daily, and instantaneous maximum effluent limits.

[3] The annual water column monitoring for total PCBs is staggered, i.e., each of the three Idaho dischargers is to monitor for PCBs once per year, but during a specific four-month period. This will result in a total of 15 samples being taken at each PCB monitoring location over the course of the five-year permits.

Table 3: Proposed Final Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) November – February	mg/L	25	40	—
	lb/day	1251	2002	—
	% removal	85% (minimum)	—	—
$CBOD_5$ [2] March – October	mg/L	15	24	—
	lb/day	500	800	—
	% removal	85% (minimum)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	1500	2250	—
	% removal	85% (minimum)	—	—
pH (November – March)	s.u.	6.4 to 9.0 at all times		
pH (April – June)	s.u.	6.2 to 9.0 at all times		
pH (July – October)	s.u	6.5 to 9.0 at all times		
Total Phosphorus as P[2] (March)	µg/L	1000	1500	—
	lb/day	50.0	75.1	—
Total Phosphorus as P[2] (April – May)	lb/day	12.5	18.8	—
Total Phosphorus as P[2] (June – Sept.)	µg/L	50	75	
	lb/day	2.50	3.75	—
Total Phosphorus as P[2] (October)	µg/L	1000	1500	—
	lb/day	50.0	75.1	—
E. Coli Bacteria	#/100 ml	126[3]	—	406[1]
Total Ammonia as N[2] (Mar. – Oct., Effluent Flow ≤ 4.2 mgd)	mg/L	10	—	29
	lb/day	350	—	1000
Total Ammonia as N[2] (Mar. – Oct., Effluent Flow > 4.2 mgd)	mg/L	7.4	—	21
	lb/day	370	—	1100
Silver (November – March)	µg/L	5.82	—	15.1
	lb/day	0.29	—	0.76
Silver (April – June, effluent flow > 4.2 mgd)	µg/L	16.0	—	31.9
	lb/day	0.8	—	1.6
Silver (July – Oct.)	µg/L	4.26	—	11.1
	lb/day	0.213	—	0.555
Zinc	µg/L	120	—	168
	lb/day	6.01	—	8.42
Total Residual Chlorine (July – October)	µg/L	39	—	102
	lb/day	2.0	—	5.1
Total Residual Chlorine (November – June)	µg/L	150	—	390
	lb/day	7.5	—	20

Table 3: Proposed Final Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Notes: 1. No single sample may exceed 406 organisms per 100 ml (instantaneous maximum limit). 2. These effluent limits subject to a compliance schedule. Until the final effluent limits become effective, the permittee must comply with interim effluent limitations (see Table 5, below). Ammonia effluent limits are only subject to a compliance schedule during the months of March, April, May, June and October. Phosphorus limits are only subject to a schedule of compliance from April through September. 3. The monthly geometric mean concentration of E. coli must not exceed 126 organisms per 100 ml.				

C. Schedules of Compliance

Schedules of compliance are authorized by federal NPDES regulations at 40 CFR 122.47 and by Section 400.03 of the Idaho Water Quality Standards. The federal regulation requires that such schedules require compliance as soon as possible and that, when the compliance schedule is longer than 1 year, the schedule shall set forth interim requirements and the dates for their achievement. The time between the interim dates shall generally not exceed 1 year, and when the time necessary to complete any interim requirement is more than one year, the schedule shall require reports on progress toward completion of these interim requirements.

The proposed permit contains compliance schedules, as detailed in Table 4, below. The compliance schedules for certain pollutants include interim effluent limitations, as detailed in Table 5, below. The compliance schedules and interim limits are based on the draft Clean Water Act Section 401 certification provided to EPA by the Idaho Department of Environmental Quality. The final permit will contain compliance schedules and interim limits consistent with the State of Idaho's final Clean Water Act Section 401 certification, which may differ from the draft certification.

In addition to the conditions stipulated by Idaho DEQ in the draft certification, federal regulations at 40 CFR 122.47(a)(3)(iii) require EPA to require progress reports whenever the interval between interim requirements in the compliance schedule is more than one year. The draft certification authorizes a nine-year schedule of compliance with interim requirements due at intervals of one, four, five, and seven years after the effective date of the final permit. In compliance with 40 CFR 122.47(a)(3)(iii), the permit requires progress reports to be submitted two, three, six and eight years after the effective date of the final permit.

Because compliance schedules must be authorized by the State of Idaho in the Section 401 certification before they can be included in the final permit, comments on the compliance schedules and interim effluent limits should be directed to the Idaho Department of Environmental Quality at the address listed on the front page of this Fact Sheet and in the public notice of the availability of this draft permit.

Table 4: Schedules of Compliance Proposed in IDEQ Draft Certification			
Parameter	**Season**	**Compliance Schedule Duration**	**Interim Limits?**
Total Ammonia as N	March – May and October	9 years	No
$CBOD_5$	March – October	9 years	Yes
Total Phosphorus as P	April - September	9 years	Yes

Table 5: Interim Effluent Limits Proposed in IDEQ Draft Certification			
Parameter	**Units**	**Effluent Limits**	
		Average Monthly Limit	**Average Weekly Limit**
Total Phosphorus as P April – September	µg/L	1000	1500
	lb/day	50.0	75.1
$CBOD_5$ March – October Until 7 years after the effective date of the final permit	mg/L	20	32
	lb/day	1001	1501
$CBOD_5$ March – October From 7 years after the effective date of the final permit until 9 years after the effective date of the final permit	mg/L	15	24
	lb/day	751	1201

D. Basis for Substitution of Different Pollutant Parameters for 1999 Effluent Limits

The draft permit proposes effluent limits for E. coli in lieu of the 1999 permit's fecal coliform limits.

Statutory Prohibitions on Backsliding

Section 402(o) of the Clean Water Act (CWA) prohibits "backsliding" in NPDES permits but provides limited exceptions to this prohibition. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment (i.e. based on Section 402(a)(1)(B)). In this case, the effluent limits being revised are water quality-based effluent limits.

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). In accordance with the *U.S. EPA NPDES Permit Writers' Manual* (EPA-833-B-96-003), EPA generally views the 402(o)(2) exceptions as independent of the requirements of 303(d)(4). Therefore, it may be appropriate to relax effluent limits as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied. EPA believes that the replacement of the fecal coliform effluent limits with E. coli limits is compliant with Section 303(d)(4) of the CWA.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of water quality standards or effluent limit guidelines.

Basis for Change from Fecal Coliform to E. Coli Limits

EPA has replaced the fecal coliform effluent limits that were in the 1999 permit for this facility with effluent limits for E. Coli. When the 1999 permit was issued, fecal coliform criteria had been used to protect the beneficial uses of primary and secondary contact recreation. Since the 1999 permit was issued, the State of Idaho has adopted, and EPA has approved, water quality criteria for E. Coli to protect these uses. Therefore, EPA has included effluent limits for E. Coli, rather than fecal coliform, to protect the use of primary contact recreation in the receiving water.

The Spokane River has not been listed on Idaho's "303(d) list" as not attaining or not being expected to attain water quality standards for bacteria. When water quality standards for the relevant pollutant are being attained, Section 303(d)(4)(B) of the Act states that water quality-based effluent limits may be revised if the revision is consistent with the State's antidegradation policy.

The draft permit, like the 1999 permit, includes "criteria end-of-pipe" effluent limits for bacteria, in order to protect contact recreation beneficial uses in the receiving water. The new water quality criteria and effluent limits simply use a different indicator organism to provide the same level of protection for the beneficial use of primary contact recreation as was provided by the 1999 effluent limits. EPA does not believe that the change from fecal coliform limits to E. Coli limits will result in degradation of the receiving water or have any effect whatsoever on beneficial uses. Therefore, EPA believes that the replacement of fecal coliform effluent limits with E. Coli limits is compliant with Section 303(d)(4)(B) of the Act. Because the E. Coli limits apply current water quality criteria at the end-of-pipe, a discharge in compliance with the effluent limits will not cause or contribute to excursions above water quality standards for E. Coli. The revised limits therefore comply with the requirements of Section 402(o)(3) of the Act.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) or on the application for renewal, as appropriate, to the U.S. Environmental Protection Agency (EPA).

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits.

Table 6, below, presents the effluent monitoring requirements for the City of Coeur d'Alene in the draft permit. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The monitoring samples must not be influenced by combination with other effluent. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Monitoring Changes from 1999 Permit

The draft permit requires the permittee to perform all of the effluent monitoring required by the NPDES Form 2A application for POTWs with design flows greater than or equal to 1 mgd, so that these data will be available when the permittee applies for a renewal of its NPDES permit. The draft permit requires monitoring 3 times per week for total phosphorus during March through October, in order to determine compliance with the effluent limits in effect during that season. During the balance of the year, the permittee must monitor monthly for total phosphorus.

The monitoring frequencies for TSS, $CBOD_5$ (from November through February), and total residual chlorine were reduced due to the facility's excellent performance history for these pollutants. This reduction is consistent with the *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (EPA, 1996). Effluent limitations and monitoring requirements for fecal coliform have been replaced with corresponding requirements for E. coli, as explained in section IV.D, above.

Table 6: Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording
$CBOD_5$ November – February	mg/L	Influent and Effluent	1/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
$CBOD_5$ March – October	mg/L	Influent and Effluent	3/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
TSS	mg/L	Influent and Effluent	1/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
pH	standard units	Effluent	5/week	grab
E. Coli Bacteria	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine (July – October)	mg/L	Effluent	5/week	grab
Total Residual Chlorine (November – June)	mg/L	Effluent	1/week	grab
Total Ammonia as N (Mar – Oct.)	mg/L	Effluent	2/week	24-hour composite
	lb/day			calculation

Table 6: Effluent Monitoring Requirements				
Parameter	**Unit**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Ammonia as N (Nov. – Feb)	mg/L	Effluent	1/month	24-hour composite
Total Phosphorus March - October	μg/L	Effluent	3/week	24-hour composite
	lb/day			calculation
Total Phosphorus November – February	μg/L	Effluent	1/month	24-hour composite
Silver	μg/L	Effluent	1/month	24-hour composite
	lb/day			calculation
Zinc	μg/L	Effluent	1/month	24-hour composite
	lb/day			calculation
Temperature	ºC	Effluent	5/week	grab
Cadmium	μg/L	Effluent	1/month	24-hour composite
Copper	μg/L	Effluent	1/month	24-hour composite
Lead	μg/L	Effluent	1/month	24-hour composite
Alkalinity	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Hardness	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Oil and Grease	mg/L	Effluent	3x/5years	grab
Total Dissolved Solids	mg/L	Effluent	3x/5years	24-hour composite
Total Polychlorinated Biphenyls	pg/L	Effluent	1/quarter	24-hour composite
Orthophosphate as P	mg/L	Effluent	1/month	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/month	24-hour composite
Nitrate plus Nitrite Nitrogen	mg/L	Effluent	1/month	24-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	3x/5years	---
Whole Effluent Toxicity	TU_c	Effluent	Annual	24-hour composite

Notes:
1. Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
2. Percent removal is calculated using the following equation:
(average monthly influent - effluent) average monthly influent.

C. Surface Water Monitoring

Table 7 presents the proposed surface water monitoring requirements for the draft permit. The City of Coeur d'Alene should work with the Idaho Department of Environmental Quality (IDEQ) Coeur d'Alene Regional Office to establish appropriate monitoring locations. The surface water monitoring will be used to re-evaluate the impact of the Idaho point sources to the Spokane River on dissolved oxygen concentrations in the State of Washington when the permits are reissued.

Surface water monitoring results for the previous calendar year for all parameters except periphyton must be submitted with the January DMR. Periphyton monitoring results must be submitted with the application for renewal of this NPDES permit. The sampling locations for surface water monitoring are as follows:

1. Lake Coeur d'Alene at Spokane River outlet.
2. Spokane River upstream of the City of Coeur d'Alene outfall.

3. Spokane River downstream of the City of Coeur d'Alene outfall and upstream of the Hayden Area Regional Sewer Board outfall.
4. Spokane River downstream of the Hayden Area Regional Sewer Board outfall and upstream of the Post Falls Dam.
5. Spokane River downstream of the City of Post Falls outfall.
6. Skalan Creek at mouth.

Table 7: Surface Water Monitoring Requirements for the City of Coeur d'Alene

Parameter (units)	Sample Locations	Sample Frequency	Sample Type
Flow rate (CFS)	6	4/year[1]	estimate or measure
Total Ammonia as N (mg/L)	2, 3, 4, 5, 6	4/year[1]	Grab
pH (standard units)	2, 3, 4	4/year[1]	Grab
Nitrite + Nitrate as N (mg/L)	2, 3, 4, 5, 6	4/year[1]	Grab
Total Phosphorus as P (µg/L)	2, 3, 4, 5, 6	4/year[1]	Grab
Orthophosphate as P (µg/L)	2, 3, 4, 5, 6	4/year[1]	Grab
Dissolved Oxygen (mg/L)	2, 3, 4, 5	4/year[1]	Grab
Chlorophyll a	2, 3, 4	4/year[1]	Grab
Periphyton	5	4/year[1]	Grab
Total Polychlorinated Biphenyls	1, 2	1/year[2]	Grab

Notes:
Notes:
1. The permittee must sample the receiving water at the specified locations for the specified parameters at least once between the 1st and 10th days (inclusive) of the months of July, August, September, and October.
2. The permittee must sample the receiving water at least once during the season of January – April.

VI. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. Under the CWA, EPA has the authority to issue separate sludge-only permits for the purposes of regulating biosolids. EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. Other Permit Conditions

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The City is required to develop and implement a Quality Assurance Plan within 90 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Phosphorus Management Plan

Federal regulations at 40 CFR 122.44(k) require the permittee to use best management practices (BMP) in order to control or abate the discharge of pollutants whenever BMPs are reasonably necessary to carry out the purposes and intent of the CWA. Because the Spokane River and Lake Spokane's assimilative capacity for nutrient discharges is very small, and because it will be several years before the permittee will be able to fund, design, build, and optimize capital improvements to the treatment plant, EPA believes it is reasonably necessary in this case for the permittee to use best management practices to control or abate the discharge of phosphorus from the wastewater treatment plant. The draft permit requires the permittee to develop and implement a phosphorus management plan within 1 year of the effective date of the final permit, and implement the plan within 18 months of the effective date of the final permit. The draft permit contains certain conditions which must be included in the phosphorus management plan.

C. Pretreatment

The proposed permit contains requirements that the City control industrial dischargers, pursuant to 40 CFR 403. Indirect dischargers to the treatment plant must comply with the applicable requirements of 40 CFR 403, any categorical pretreatment standards promulgated by EPA, and any additional or more stringent requirements imposed by the City of Coeur d'Alene as part of its approved pretreatment program or sewer use ordinance (e.g. local limits).

D. Additional Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has prepared a biological evaluation and determined that the discharge from the City of Coeur d'Alene may affect, but is not likely to adversely affect bull trout and will have no effect on bald eagles (EPA, 2007).

EPA will seek concurrence from USFWS on the not likely to adversely affect determination. For a more complete discussion of the discharges' effects on endangered or threatened species, see Appendix H. The biological evaluation is part of the administrative record of this permit and can be obtained from EPA Region 10 upon request.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. EPA has determined that the discharge from the City of Coeur d'Alene WWTP will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action.

C. State/Tribal Certification

Section 401 of the CWA requires EPA to seek State or Tribal certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with water quality standards.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

Cusimano, Bob. *Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment for Protecting Dissolved Oxygen*. Washington State Department of Ecology, Environmental Assessment Program. Publication No. 04-03-006. February 2004.

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.

EPA. 2007. *Biological Evaluation for Reissuance of NPDES Permits to the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board.* EPA Region 10. Office of Water and Watersheds.

Idaho Department of Environmental Quality. 2000. *Sub-basin Assessment and Total Maximum Daily Loads of Lakes and Streams Located on or Draining to the Rathdrum Prairie.* November 22, 2000. Coeur d'Alene, ID.

Merrill, Ken and Bob Cusimano. *Draft Total Maximum Daily Load To Restore and Maintain Dissolved Oxygen in the Spokane River and Lake Spokane (Long Lake):*

Submittal Report. Washington State Department of Ecology, Water Quality Program. October 2004.

Nickel, Brian. 2007. *Reasonable Potential Analysis for Zinc at the Washington State Line.* February 5, 2007. US EPA Region 10. Office of Water and Watersheds.

Nickel, Brian. 2007. *Temperature Reasonable Potential Analysis for Dischargers to the Spokane River in Idaho.* February 5, 2007. US EPA Region 10. Office of Water and Watersheds.

Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

Appendix A: Facility Information

General Information

NPDES ID Number: ID-002285-3

Facility Information

Type of Facility: Publicly Owned Treatment Works (POTW)

Treatment Train

Preliminary Treatment
- Flow measurement and recording
- Solids removal (bar screen)
- Dewatering and landfilling removed solids
- Preaeration/grit removal

Primary Treatment
- Primary Clarification

Secondary Treatment
- Trickling filter solids contact
- Alum addition for phosphorus removal (seasonal)
- Secondary clarification
- Chlorination
- Dechlorination with sulfur dioxide
- Flow measurement

Sludge (biosolids) Handling
- Anaerobic digestion
- Belt filter press
- Aerated static pile composting

Flow: Design flow is 6 mgd. Long term average flow from 2000 through 2005 was 3.19 mgd. Maximum daily flow was 4.62 mgd.

Outfall Location: Outfall 001: latitude 47° 40' 56" N; longitude 116° 47' 47" W

Receiving Water Information

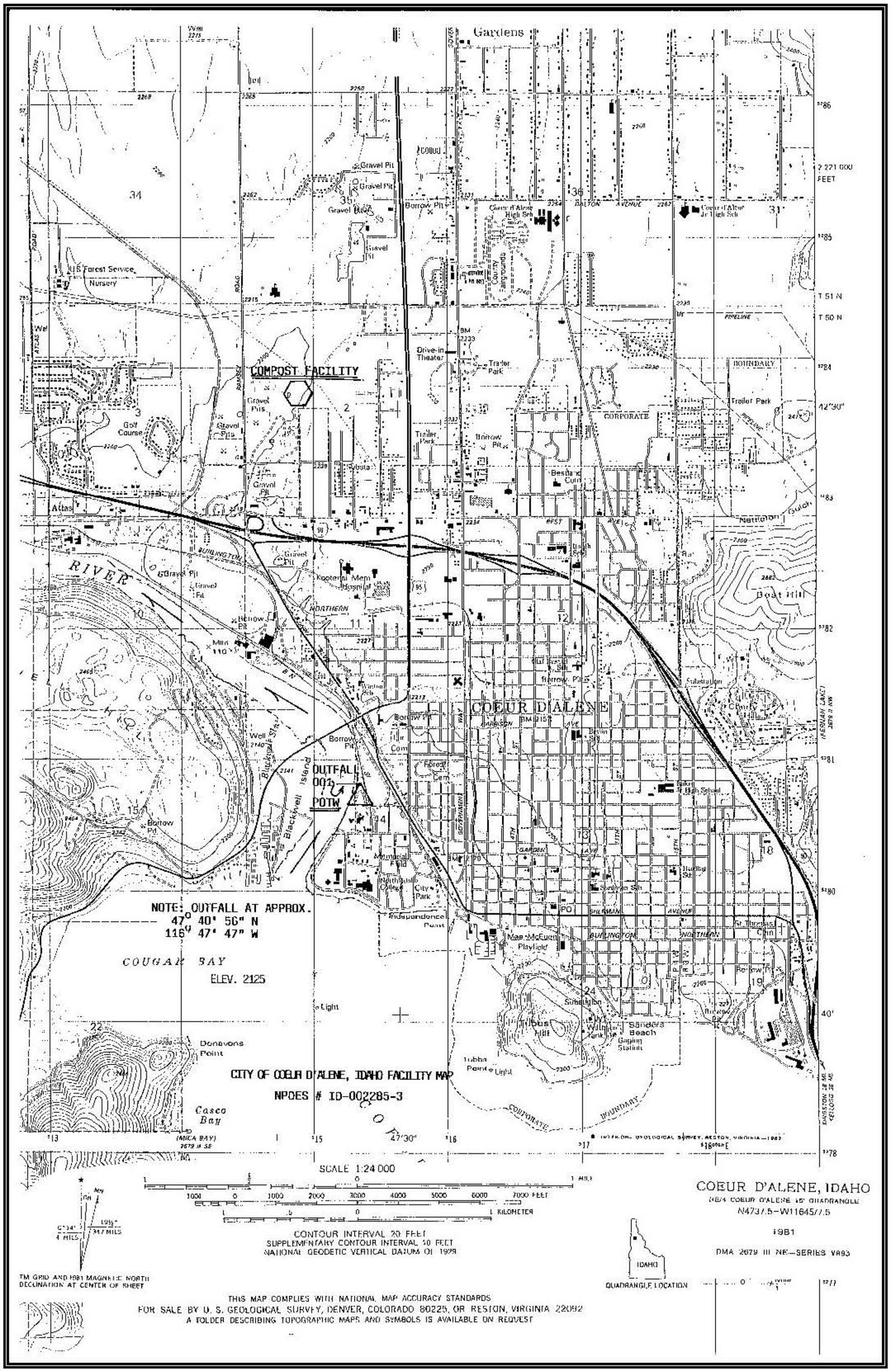
Receiving Water: Spokane River

Watershed: Upper Spokane (HUC 17010305)

Beneficial Uses:

Cold water aquatic life
Salmonid Spawning
Primary contact recreation
Water supply for:
- Agricultural
- Industrial

Appendix B: Facility Map



Appendix C: Basis for Water Quality-based Effluent Limits to Protect Dissolved Oxygen and pH in Waters of the State of Washington

A. Overview

EPA has evaluated the impact of discharges of nutrients (specifically total ammonia and total phosphorus) and carbonaceous biochemical oxygen demand (CBOD) from point source discharges to the Spokane River in the State of Idaho on downstream waters of the State of Washington. EPA has determined that the discharges of these pollutants from publicly owned wastewater treatment plants (WWTPs) operated by the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board (HARSB) have the reasonable potential to cause or contribute to water quality standards nonattainment for dissolved oxygen (DO) and pH in the State of Washington. EPA has therefore established water quality-based effluent limits for total phosphorus, total ammonia, and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) for these three dischargers.

B. Applicable Water Quality Standards and Status of Waters

Lake Spokane (also called "Long Lake"), a reservoir located in the State of Washington, and the segments of the Spokane River between the Idaho-Washington border and Lake Spokane are listed as impaired for DO in Washington's 2002/2004 303(d)/305(b) integrated report. The Spokane River is also listed as a "water of concern" (category 2) for pH in Washington. The Spokane River is not impaired for dissolved oxygen or pH in the State of Idaho, in part because the water quality criteria for DO and pH are less stringent in Idaho than in Washington. See Table C-1, below, for a comparison of DO and pH criteria for the Spokane River and Lake Spokane in the States of Idaho and Washington.

Table C-1: Dissolved Oxygen and pH Criteria for the Spokane River and Lake Spokane		
Spokane River		
Parameter	**Idaho Criterion**	**Washington Criterion**
Dissolved Oxygen	Concentrations exceeding 6.0 mg/L at all times[1]	Dissolved oxygen shall exceed 8 mg/L. If natural conditions are less than the criteria, the natural conditions shall constitute the water quality criteria.[2]
pH	Within the range of six point five (6.5) to nine point zero (9.0).	The pH shall be within the range of 6.5 to 8.5…with a human-caused variation within the above range of less than 0.5 units.
Lake Spokane (Washington Water Quality Standards)		
Dissolved Oxygen	No measurable decrease from natural conditions.[2,3]	

Notes: 1. The Idaho water quality standards, like the Washington standards, include a "Natural Background Conditions" provision (IDAPA 58.01.02.200.09), but this provision is not invoked for DO or pH, since the natural condition of the Spokane River is of higher quality than the numeric criteria for DO and pH. 2. The *Water Quality Standards for Surface Waters of the State of Washington* (Chapter 173-201A of the Washington Administrative Code or WAC) define "natural conditions" as the surface water quality that was present before any human-caused pollution. 3. For dissolved oxygen, Ecology has interpreted a "measurable decrease" from natural conditions to be a 0.2 mg/L decrease from natural conditions (Cusimano, 2004).

The State of Washington has prepared a draft *Total Maximum Daily Load To Restore and Maintain Dissolved Oxygen In the Spokane River and Lake Spokane (Long Lake)* (Merrill and Cusimano, 2004) to address the dissolved oxygen and eutrophication problems in the Spokane River and Lake Spokane in the State of Washington. This draft TMDL has not yet been finalized by the State of Washington, and therefore Washington has not sought approval of this TMDL from EPA. The draft TMDL contains load and wasteload allocations for sources located in the State of Washington for CBOD, ammonia, and total phosphorus. These three pollutants can influence dissolved oxygen concentrations in the Spokane River and Lake Spokane. In the technical analysis conducted in support of the draft TMDL, the State of Washington determined that the most critical location in the watershed for dissolved oxygen is at the lower end of Lake Spokane, near Long Lake Dam (Cusimano, 2004).

The draft TMDL's inventory of pollution sources contributing to the impairment indicates that the discharges from the Cities of Coeur d'Alene and Post Falls represented approximately 5% of the total anthropogenic phosphorus loading to Lake Spokane in 2003. The Hayden Area Regional Sewer Board wastewater treatment plant (WWTP) was not included in this calculation because it did not discharge to the Spokane River during the summer of 2003. Non-point source contributions of the three pollutants of concern are insignificant in the Idaho reach of the Spokane River. The largest tributary to the Spokane River in Idaho (Skalan Creek) has a flow rate that is insignificant compared to the groundwater loss and gain in the Idaho reach of the river (Annear, Wells and Berger 2005). The proposed permits require surface water monitoring at the mouth of Skalan Creek for flow rate, total ammonia, nitrate-nitrite, total phosphorus, and orthophosphate, in order to determine the effect, if any, of Skalan Creek on nutrient and dissolved oxygen levels in the Spokane River.

C. Basis for Water Quality-Based Effluent Limits

Section 301(b)(1)(C) of the Clean Water Act requires that NPDES permits contain effluent limits more stringent than technology-based limits when those limits are necessary to meet water quality standards in the receiving water. The federal regulation 40 CFR 122.4(d) prohibits the issuance of an NPDES permit when the imposition of conditions in that permit cannot ensure compliance with the water quality standards of all affected States. This means that the water quality standards of the States of Idaho and Washington are relevant when establishing water quality-based effluent limits for the Idaho dischargers under Section 301(b)(1)(C) of the Act.

Reasonable Potential Analysis

The federal regulation 40 CFR 122.44(d)(1)(i), which implements Section 301(b)(1)(C) of the Clean Water Act, requires that NPDES permits contain water quality-based effluent limitations for all pollutants or pollutant parameters that EPA determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including narrative criteria for water quality. When determining whether a discharge has the reasonable potential to cause or contribute to water quality standards nonattainment, the federal regulation 40 CFR 122.44(d)(1)(ii) requires EPA to account for existing controls on point and non-point sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, and, where appropriate, the dilution of the effluent in the receiving water. Consideration of Washington's water quality criteria for dissolved oxygen necessitates a far-field analysis that estimates the fate and transport of multiple pollutants from multiple point sources. This type of analysis is impossible without considering the dilution of the effluent in the receiving water.

To determine if the discharges from the HARSB, Post Falls, and Coeur d'Alene WWTPs have the reasonable potential to cause or contribute to water quality standards nonattainment for dissolved oxygen and pH in the State of Washington, EPA used a CE-QUAL-W2 dynamic, 2-dimensional water quality model (the same model Ecology used to prepare its draft TMDL) to evaluate the impacts of the discharges on the waters of the State of Washington. The model is "split" into two reaches of the river; one for the outlet of Lake Coeur d'Alene downstream to the State line, and another for the State line downstream to the end of Lake Spokane. The output of the Idaho reach model comprises the upstream boundary condition for the Washington reach model. Model documentation can be obtained from Portland State University's website[1].

In the reasonable potential analysis, for the "critical period" of March 1 through October 31, the $CBOD_5$ effluent concentrations for all three WWTPs were set equal to the technology-based average monthly limit of 25 mg/L from the "secondary treatment" regulations in 40 CFR 133.102(a)(4)(i). The total phosphorus effluent concentrations for Coeur d'Alene and Post Falls were set equal to that which would result from 80% removal of influent total phosphorus. Ammonia effluent concentrations for Coeur d'Alene and Post Falls were set equal to the 1999 permits' average monthly limits. HARSB's total phosphorus and ammonia effluent concentrations were set equal to the 90^{th} percentile of historic concentrations[2]. Flow rates for all three WWTPs were set equal to each WWTP's design flow as reported on the applications for renewal of the permits. These high concentrations and flows were used in order to account for the variability of these pollutants in the effluent, as required by the regulations. The river flow rate and meteorological parameters were set equal to actual conditions in the year 2001, which was chosen as the "design year" for the draft Washington TMDL to protect dissolved oxygen in Lake Spokane. Flow rates in the Spokane River were near 10-year lows in 2001[3].

Under this scenario, the model predicted that the discharges would cause a decrease in dissolved oxygen concentrations in Lake Spokane of as much as 1.1 mg/L and at the State line of as much as 0.28 mg/L, and would increase pH at the State line by as much as 1.77 standard units. These impacts would cause nonattainment of Washington's water quality standards in Lake Spokane for DO and at the State line for both DO and pH. Therefore, the discharges of total phosphorus, total ammonia, and CBOD from the three WWTPs have the reasonable potential to cause or

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[1] http://www.cee.pdx.edu/w2/

[2] HARSB's 1999 permit had no TP limits, and its 1999 ammonia limits were not representative of its historic discharges.

[3] The lowest 7-day average flow rate observed at the Post Falls gauge during calendar year 2001 was 250 CFS, observed between August 31^{st} and September 6^{th}, 2001. The 7Q10 flow rate calculated by DFLOW for the period of record of 1974-2004 is 295 CFS.

contribute to water quality standards nonattainment for dissolved oxygen and pH in the State of Washington, and the permits must contain water quality-based effluent limits for these three pollutants. EPA has therefore established water quality-based effluent limits for the Idaho dischargers to the Spokane River that are derived from and comply with Washington's water quality standards.

Calculating Effluent Limits

The federal regulation 40 CFR 122.44(d)(1)(vii)(A) requires the permitting authority to ensure that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards.

Because Ecology determined in its TMDL analysis that the downstream end of Lake Spokane was the most critical location in the watershed, EPA evaluated the impacts of the Idaho discharges at this location, as well as two "check" locations; one of these was a second location in Lake Spokane, and the other was the State line. EPA confirmed that the most critical location in the watershed, with respect to dissolved oxygen impacts from the Idaho dischargers, is the downstream end of Lake Spokane. This means that if discharges from the Idaho point sources are limited to the extent necessary to meet the DO standard in Lake Spokane, pH and DO conditions at the State border will meet the Washington standards. Therefore, the remainder of this discussion will focus on dissolved oxygen impacts in Lake Spokane rather than DO and pH effects at the State border.

The Washington TMDL for the Spokane River and Lake Spokane has not yet been finalized and approved, and therefore the final wasteload allocations are uncertain, as are the final effluent limitations for point sources that will be based on those wasteload allocations. Point source dischargers in both States have raised questions as to the attainability of the DO standard in Lake Spokane. Once finalized and approved, the Lake Spokane/Spokane River DO TMDL will only assign load and wasteload allocations to sources discharging to the Spokane River in Washington State. In the draft TMDL, Ecology proposed a compliance schedule that would defer imposition of final effluent limitations for point sources under its jurisdiction for ten years to allow the dischargers time to make necessary capital improvements to their treatment facilities and to evaluate the efficacy of various treatment technologies.

For these reasons, the cumulative impact of all sources in both States on Lake Spokane dissolved oxygen concentrations cannot be determined at this time. Therefore, EPA believes it is appropriate at this time to analyze the effects of the Idaho discharges as distinct from Washington sources when deriving limits for the Idaho permits that are derived from and comply with Washington's water quality standards. Therefore, EPA proposes to limit the Idaho dischargers such that the cumulative loading from the three Idaho discharges will not cause a measurable decrease in dissolved oxygen concentrations in the Lake Spokane relative to the natural condition of the watershed. Pursuant to 40 CFR 122.44(d)(1)(vii)(A), this analysis "derives from and complies with" the Washington DO standard based on the impact of the Idaho point sources.

As stated in the *Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment for Protecting Dissolved Oxygen* (Cusimano, 2004), Ecology has generally allowed a 0.2 mg/L decrease in dissolved oxygen concentrations in TMDLs for oxygen-demanding substances, pursuant to its dissolved oxygen criterion of "no measurable decrease from natural conditions."

This is how the loading capacity was calculated in the draft Spokane River/Lake Spokane DO TMDL. In other words, Ecology has interpreted its narrative criterion of "no measurable decrease from natural conditions" to mean "less than a 0.2 mg/L decrease from natural conditions."

Consistent with this interpretation of a "measurable decrease" in dissolved oxygen concentrations, EPA has considered any decrease in dissolved oxygen of less than 0.2 mg/L to be "less than measurable" for the purposes of permitting the Idaho dischargers. Therefore, EPA has established effluent limits for the Idaho dischargers such that those discharges do not cause more than a 0.2 mg/L decrease in dissolved oxygen concentrations in the State of Washington at the most critical location in the watershed, on the most critical day, under critical low-flow conditions, thereby ensuring compliance with Washington's water quality standard of "no measurable decrease from natural conditions" in Lake Spokane under all foreseeable receiving water and discharge conditions.

To calculate these effluent limits, EPA used the CE-QUAL-W2 model to run a series of trial-and-error simulations, adjusting the simulated phosphorus, CBOD, and ammonia loadings until the model predicted that the Idaho dischargers would cause a less-than-measurable decrease in dissolved oxygen concentrations in Lake Spokane. Once a discharge scenario was found such that the dissolved oxygen impact upon Lake Spokane was less than measurable, EPA then verified that the model predicted that Washington water quality standards would be met at the State line. The modeling is documented in more detail in the *Assessment of the Water Quality Impact of Idaho Wastewater Treatment Plants on the Spokane River and Lake Spokane* (Cope, 2006).

Proposed Effluent Limits

EPA's modeling efforts have shown that the effluent limits that are derived from and comply with the applicable water quality standards of Idaho and Washington are as follows:

Table C-2: Proposed Final Effluent Limits for Total Phosphorus, CBOD and Ammonia

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Proposed Final Effluent Limits for the City of Coeur d'Alene				
Total Phosphorus as P (March)	μg/L	1000	1500	—
	lb/day	50.0	75.1	—
Total Phosphorus as P (April – May)	lb/day	12.5	18.8	—
Total Phosphorus as P (June – Sept.)	μg/L	50	75	—
	lb/day	2.50	3.75	—
Total Phosphorus as P (October)	μg/L	1000	1500	—
	lb/day	50.0	75.1	—
Total Phosphorus as P (Nov. – Feb.)	lb/day	Report	Report	—
Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) (November – February)	mg/L	25	40	—
	lb/day	1251	2002	—
	% removal	85% (min.)	—	—
Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	mg/L	15	24	—
	lb/day	500	800	—

Table C-2: Proposed Final Effluent Limits for Total Phosphorus, CBOD and Ammonia				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
(November – February)	% removal	85% (min.)	—	—
Total Ammonia as N (March – October, Effluent Flow > 4.2 mgd)	mg/L	7.4	—	21
	lb/day	370	—	1100
Total Ammonia as N (March – October, Effluent Flow ≤ 4.2 mgd)	mg/L	10	—	29
	lb/day	350	—	1000
Proposed Final Effluent Limits for the City of Post Falls				
Total Phosphorus as P (March)	lb/day	29.0	43.5	—
Total Phosphorus as P (April – May)	lb/day	7.26	10.9	—
Total Phosphorus as P (June – Sept.)	μg/L	50	75	—
	lb/day	1.45	2.18	—
Total Phosphorus as P (October)	μg/L	1000	1500	—
	lb/day	29.0	43.5	—
Total Phosphorus as P (Nov. – Feb.)	lb/day	Report	Report	—
$CBOD_5$ (November – February)	mg/L	25	40	—
	lb/day	726	1161	—
	% removal	85% (min.)	—	—
$CBOD_5$ (March – October)	mg/L	12	19	—
	lb/day	290	464	—
	% removal	85% (min.)	—	—
Total Ammonia as N (March – October)	mg/L	8.2	—	29.5
	lb/day	238	—	856
Total Ammonia as N (November – February)	mg/L	25.4	—	91.7
	lb/day	737	—	2661
Hayden Area Regional Sewer Board				
Total Phosphorus as P (March)	lb/day	13.8	20.6	—
Total Phosphorus as P (April – May)	lb/day	6.88	10.3	—
Total Phosphorus as P (June – Sept.)	lb/day	0.14	0.21	—
Total Phosphorus as P (October)	lb/day	13.8	20.6	—
Total Phosphorus as P (Nov. – Feb.)	lb/day	Report	Report	—
$CBOD_5$ (November – February)	mg/L	25	40	—
	lb/day	344	550	—
	% removal	85% (min.)	—	—
$CBOD_5$ (March – October)	mg/L	15	24	—
	lb/day	138	220	—
	% removal	85% (min.)	—	—
Total Ammonia as N (March – October)	mg/L	10	—	22.9
	lb/day	138	—	315
Total Ammonia as N (November – February)	mg/L	78.7	—	250
	lb/day	1083	—	3440

Comparison to 1999 Effluent Limits

All three facilities will be required to significantly reduce discharges of total phosphorus, CBOD, and ammonia compared to currently permitted levels. The mass effluent limits for CBOD for all three dischargers have been reduced by 60 percent relative to the technology-based limits (which were used in the 1999 permits) between March and October.

For total phosphorus, for Coeur d'Alene and Post Falls, these water quality-based effluent limits represent a 95 to 98 percent reduction in permitted discharges between June and September, and a 75 to 89 percent reduction during April and May. In March and October, the proposed effluent limits represent a 52% reduction in permitted discharges of total phosphorus for Post Falls. Average monthly total phosphorus effluent limits for the City of Coeur d'Alene during March and October are as stringent as those in the 1999 permit. In addition, the proposed permit for the City of Coeur d'Alene deletes the 1999 permit's provision to replace the concentration limits with a less stringent percent removal requirement when influent phosphorus concentrations are high, and it now includes average weekly limits, which it did not previously.

At design flow, the proposed effluent limits will require the Cities of Coeur d'Alene and Post Falls to remove approximately 85% of influent total phosphorus in March and October, 96% in April and May, and 99% from June through September. Ammonia limits which had previously been effective only from July through September will now be effective from March through October. For Post Falls, this represents a 68% reduction in monthly average ammonia limits from March through June and during October.

The Hayden Area Regional Sewer Board will have water quality-based effluent limits for total phosphorus for the first time, and will be permitted to discharge total phosphorus from June through September (when it has the option of land applying its effluent) only at levels comparable to natural background. Equivalent percent removal of total phosphorus is similar to the Coeur d'Alene and Post Falls facilities in March and October. At design flow, the proposed effluent limits will require the HARSB facility to remove approximately 93% of influent total phosphorus in April and May, and 99.9% from June through September. From March through October, the draft permit proposes an 87% reduction in monthly average ammonia limits.

EPA acknowledges that the effluent limits proposed are not the only combination of limits that would prevent the Idaho dischargers from causing nonattainment of Washington's water quality standards. If EPA is presented with information during the public comment period demonstrating that a different combination of effluent limits could be imposed such that are derived from and comply with the water quality standards of both States, EPA will consider this information in its decision on final effluent limits, and may revise the final effluent limits accordingly.

Basis for Expressing Limits Using Mass, Concentration, and Removal Rate

The federal regulation 40 CFR 122.45(f)(1) requires that effluent limits be expressed in terms of mass, except for pollutants that cannot be properly expressed as mass (e.g. pH and temperature) and when applicable standards and limitations are expressed in terms of other units of measurement. The regulation 40 CFR 122.45(f)(2) allows pollutants which are limited in terms of mass to be additionally limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.

The secondary treatment effluent limits for POTWs are expressed in terms of BOD_5 or $CBOD_5$ concentration and removal rate. Therefore, the permits must contain $CBOD_5$ or BOD_5 concentration and removal rate effluent limits. The permits also contain mass effluent limits for $CBOD_5$, because it is practicable to calculate mass effluent limits for $CBOD_5$ based on the technology-based concentration limit and the design flow of the treatment plant (see Appendix D). The $CBOD_5$ effluent limits (mass, concentration and removal rate) are technology-based from November through February. The technology-based percent removal limit (85%) is in effect at all times. From November through March, the concentration and mass $CBOD_5$ limits are water quality-based.

The average monthly $CBOD_5$ loading limit (expressed in pounds per day) for March through October is equal to the mass of $CBOD_5$ simulated in the CE-QUAL-W2 model scenario that forms the basis for the effluent limits. The average monthly $CBOD_5$ loading limits are equivalent to the loading of $CBOD_5$ that would be discharged if the effluent $CBOD_5$ concentrations were 10 mg/L and the flow rates were equal to the design flow rates of each discharger. These mass limits are equal to 40% of the technology-based mass limits (which is the mass of $CBOD_5$ that would be discharged at a concentration of 25 mg/L at the design flow rate).

The $CBOD_5$ concentration limits from March through October are equal to the interim concentration limits from the compliance schedules authorized by IDEQ's draft certifications for each discharger. EPA is required by 40 CFR 122.44(d)(3) to include conditions in permits necessary to conform to the conditions of a State certification. While the concentrations in the draft certifications are interim, not final, effluent limitations, EPA believes it is reasonable for the final concentration limits to be at least as stringent as the interim concentration limits. Note that the final $CBOD_5$ mass limits are more stringent than the interim $CBOD_5$ mass limits.

The phosphorus effluent limits are water quality-based. The average monthly phosphorus loading limits are equal to the mass of phosphorus simulated in the CE-QUAL-W2 model scenario that forms the basis for the effluent limits. The average monthly phosphorus mass limits for Coeur d'Alene and Post Falls are equal to the mass of phosphorus that would be discharged if the concentrations of phosphorus were equal to 1000 µg/L in March and October, 250 µg/L in April and May, and 50 µg/L from June through September. The average monthly phosphorus mass limits for the Hayden Area Regional Sewer Board are equal to the mass of phosphorus that would be discharged if the concentrations of phosphorus were equal to 1000 µg/L in March and October, 500 µg/L in April and May, and 10 µg/L from June through September.

From June through October, the Cities of Post Falls and Coeur d'Alene also have concentration limits for phosphorus. The average monthly concentration limits are equal to concentrations of phosphorus simulated in the model. This is because the minimum dilution ratio for this season, after the effluents mixed with 100% of the river flow, is less than 100:1. The *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) recommends establishing concentration limits in addition to mass limits when there is less than 100-fold dilution in the receiving water, in order to assure attainment of water quality standards. The minimum dilution ratio for the Hayden Area Regional Sewer Board is greater than 100:1, therefore it is not necessary to impose concentration limits for phosphorus for the Hayden except those necessary to conform to the State's certification (interim limits). The City of Coeur d'Alene also has concentration limits for phosphorus in March, which are imposed for compliance with the anti-backsliding provisions of the Act.

Basis for Average Monthly, Average Weekly, and Maximum Daily Limits

The federal regulation 40 CFR 122.45(d)(2) requires that effluent limits for continuous discharges from POTWs be expressed as average monthly and average weekly discharge limitations, unless impracticable. When evaluating the effects of the Idaho dischargers using the CE-QUAL-W2 model, EPA simulated constant discharges during each of the following seasons: March, April through May, June through September, and October. The average monthly limits have been set equal to the levels of discharge simulated in the model, as explained above.

When average monthly limits are calculated in this manner, EPA would normally calculate average weekly limits based on historical effluent variability. In this case, because capital improvements will be necessary to meet the proposed effluent limits, the historical effluent data may not be representative of the variability of these pollutants in the effluent, once new treatment processes are operational. Therefore, EPA has calculated average weekly limits as follows. For $CBOD_5$, EPA has maintained a ratio of the average weekly limit to the average monthly limit consistent with the technology-based “secondary treatment” $CBOD_5$ limits (1.6:1). For total phosphorus, EPA has used a ratio of 1.5:1, consistent with the “secondary treatment” BOD_5 and TSS effluent limits, and 40 CFR 133.101(f). EPA believes these ratios are representative of typical effluent variability for POTWs.

Ammonia is both a nutrient and a toxin. In order to prevent acute toxicity to aquatic life, the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) recommends that effluent limits for pollutants which may be toxic to aquatic life be expressed as average monthly and maximum daily limits rather than average monthly and average weekly limits. This is because it is impossible to prevent acute toxicity using an average weekly limit. Therefore, it is “impracticable” to express effluent limits for pollutants which may cause acute toxicity to aquatic life as average monthly and average weekly limits. Effluent limits for ammonia (and water quality-based effluent limits for metals and chlorine) are expressed as average monthly and maximum daily limits in order to prevent acute toxicity to aquatic life. For Coeur d’Alene and Post Falls, the applicability of the 1999 permits’ “summer” ammonia limits, which were intended to prevent toxicity, has simply been extended from March through October. The numerical values of the limits have not been changed.

For the Hayden Area Regional Sewer Board, the historical effluent data may not be representative of the variability of ammonia in the effluent in the future. Therefore, EPA has calculated a maximum daily limit based on a “default” coefficient of variation (CV) of 0.6. This is the value of the CV that the TSD recommends permitting authorities use when limited effluent data are available.

Check of Proposed Ammonia Limits for Compliance with Idaho WQS

The March through October ammonia limits are not based the pollutant’s toxic effects to aquatic life, but on preventing the discharge from causing nonattainment of dissolved oxygen water quality standards in the State of Washington. EPA has determined that a discharge in compliance with the proposed effluent limits will also prevent the discharges from causing or contributing to excursions above Idaho’s water quality standards for ammonia toxicity, as explained below.

Table C-3: Check of Proposed Ammonia Limits for Compliance with Idaho WQS				
Discharger	**Proposed Ammonia Limits**		**Hypothetical Ammonia Limits Based Solely on Idaho WQS (July – October)**	
	Average Monthly Limit (mg/L)	**Max. Daily Limit (mg/L)**	**Average Monthly Limit (mg/L)**	**Max. Daily Limit (mg/L)**
City of Coeur d'Alene (March – October, Effluent Flow > 4.2 mgd)	7.4	21	25.7	46.1
City of Coeur d'Alene (March – October, Effluent Flow ≤ 4.2 mgd)	10.0	29	35.7	64.0
City of Post Falls	8.2	29.5	25.6	81.0
Hayden Area Regional Sewer Board	10.0	22.9	53.3	122

Because the proposed ammonia limits are more stringent than those calculated solely on the basis of Idaho's water quality standards, the proposed ammonia limits are stringent enough to ensure compliance with Idaho's water quality standards at the edge of each facility's mixing zone. The July through October season chosen for this comparison is the season during which ammonia limits calculated based on Idaho's numeric criteria would be most stringent, due to low receiving water flows (and therefore limited dilution available in the receiving water) and high receiving water temperatures[4].

D. Effect on the Downstream State

Lake Spokane Effects

In compliance with 40 CFR 122.4(d), the proposed effluent limits will ensure that the Idaho dischargers will not cause nonattainment of Washington's dissolved oxygen water quality standards in Lake Spokane, which is the point of maximum impact for the permitted discharges. Dissolved oxygen concentrations in Lake Spokane will not be measurably decreased from natural conditions (i.e. <0.2 mg/L) due to the Idaho point sources.

State Line Effects

In compliance with 40 CFR 122.4(d), the proposed effluent limits for the Idaho point sources will ensure that Washington's water quality standards are met at the State line. The Idaho point sources' impacts on dissolved oxygen, pH, total phosphorus and CBOD in the Spokane River at the State border during the "TMDL period" of April 1 through October 31 will be negligible once the Idaho dischargers achieve compliance with the effluent limits in the proposed permits. Increases in monthly average total phosphorus concentrations at the State line will be less than 0.6 µg/L (0.0006 mg/L) under year 2001 river flow conditions (which were close to 1-in-10 year low flows), except during the month of October, when the TP increase will be approximately 7.9 µg/L. Total phosphorus concentrations at the State line are predicted to be lower with the discharges than without during the months of June, July and August. While the increase in October may seem large, the CE-QUAL-W2 model predicts that the discharge of phosphorus in October will not cause dissolved oxygen depletion in Lake Spokane, nor will it cause

[4] Water quality criteria for ammonia become more stringent with increasing temperature.

nonattainment of Washington's pH or DO standards at the State line, therefore it is not significant. Increases in monthly average ultimate CBOD ($CBOD_u$) concentrations at the State line are predicted to be less than 0.9 mg/L at all times. This is approximately equivalent to an increase in five-day CBOD ($CBOD_5$) of less than 0.3 mg/L. These increases are not significant and the CE-QUAL-W2 model predicts that they will not result in nonattainment of Washington's water quality standards at any location in the watershed under critical conditions. Once the Idaho dischargers achieve compliance with the final effluent limits in the proposed permits, the in-stream pH and DO, as well as the in-stream nutrient and CBOD concentrations will be, for all practical purposes, unchanged from natural conditions in the Spokane River at the State line from March through October.

Conservative Assumptions

EPA employed several conservative assumptions to ensure that the final effluent limits would be protective of water quality in both States. The use of conservative assumptions allows EPA to ensure that the effluent limits are derived from and comply with water quality standards even though the modeling of the dischargers' impacts has some degree of uncertainty. These conservative assumptions are described below.

The dissolved oxygen decrease in Lake Spokane was measured as a 95^{th} percentile decrease over the entire depth of the lake on the most critical model output day (the output day that the model predicted would exhibit the greatest dissolved oxygen decrease) at the most critical location in Lake Spokane (the location where the model predicted would exhibit the greatest dissolved oxygen decrease). The river flows used in the model simulation were those measured in 2001, which are comparable to 1-in-10 year low flows. Also, as described above, the final monthly average effluent limitations were set equal to the levels of discharge simulated in the model. In order to consistently achieve the effluent limitations, the dischargers will need to discharge loadings and concentrations lower than the monthly average effluent limits most of the time.

This means that, even at the most critical location, on the most critical day of a low-flow year, with all three Idaho point sources discharging the maximum amounts of phosphorus, ammonia and CBOD allowed by their permits' final effluent limits, the model predicts that 95 percent of the Lake Spokane water column will exhibit less than a 0.2 mg/L decrease in dissolved oxygen concentrations and that none of the water column will exhibit more than a 0.2 mg/L decrease resulting from discharges from the Idaho point sources.

E. Conclusion

The effluent limits that EPA is proposing for total phosphorus, ammonia and CBOD are derived from and comply with the applicable water quality standards of the States of Idaho and Washington. Discharges in compliance with the effluent limits proposed in the draft permits will prevent these discharges from causing water quality standards nonattainment at all times and at all locations in the watershed.

F. References

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Merrill, Ken and Bob Cusimano. *Draft Total Maximum Daily Load To Restore and Maintain Dissolved Oxygen in the Spokane River and Lake Spokane (Long Lake): Submittal Report. Washington State Department of Ecology, Water Quality Program.* October 2004.

Appendix D: Basis for Effluent Limits

The following discussion explains in more detail the statutory and regulatory basis for the technology and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, and Part C discusses facility specific effluent limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

In sections 301(b)(1)(B) and 304(d)(1), the CWA established a performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. EPA developed and promulgated "secondary treatment" regulations that are found in 40 CFR 133.102. These technology-based effluent limits apply to all municipal wastewater treatment plants, and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD_5 or $CBOD_5$, TSS, and pH. The regulations allow effluent limits for oxygen demanding material to be expressed as either BOD_5 or $CBOD_5$, at the option of the permitting authority. EPA has elected to express the effluent limits in terms of $CBOD_5$ in this case. The federally promulgated secondary treatment effluent limits are listed in Table D-1.

Table D-1: Secondary Treatment Effluent Limits
(40 CFR 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	30 mg/L	45 mg/L	---
$CBOD_5$	**25 mg/L**	**40 mg/L**	
TSS	**30 mg/L**	**45 mg/L**	**---**
Removal Rates for BOD_5, $CBOD_5$ and TSS	**85% (minimum)**	**---**	**---**
pH	**---**	**---**	**6.0 - 9.0 s.u.**

EPA has determined that the "secondary treatment" TSS effluent limitations are stringent enough to protect water quality in the Spokane River at all times. See the discussion under "Total Suspended Solids," below. EPA has determined that the "secondary treatment" $CBOD_5$ effluent limits are stringent enough to protect water quality in the States of Idaho and Washington from November through February. From March through October, more stringent water quality-based $CBOD_5$ effluent limits apply (see Appendix C). EPA has determined that the "secondary treatment" pH effluent limits are not stringent enough to protect water quality in the Spokane River, therefore, more stringent water quality-based pH effluent limits apply.

Chlorine

The City of Coeur d'Alene Wastewater Treatment Plant uses chlorine to disinfect its wastewater. A 0.5 mg/L average monthly limit for chlorine is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/L. EPA believes these limits represent the "best practicable waste treatment technology" for chlorine, which POTWs were required to achieve by July 1st, 1983 (40 CFR 125.3(a)(1)(ii)).

The 1999 permit had water quality-based effluent limits for chlorine. EPA has determined that the 1999 permit's effluent limits are stringent enough to protect water quality standards except during the month of October. The proposed permit includes more stringent effluent limits for chlorine during the month of October than did the 1999 permit.

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[1]

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit when the imposition of conditions in that permit cannot ensure compliance with the water quality standards of all affected States. The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for 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 or Tribal water quality standard, including narrative criteria for water quality.

The regulations require the permitting authority to make this evaluation 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.

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on numeric criteria, EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from

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[1] 8.34 is a conversion factor with units (lb × L)/(mg × gallon × 10^6)

the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Mixing Zones

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body, and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones must be authorized by the Idaho Department of Environmental Quality (IDEQ). Based on IDEQ's draft Clean Water Act Section 401 certification, some of the water quality-based effluent limits in this permit have been calculated using a mixing zone. If IDEQ does not grant a mixing zone in the final Clean Water Act Section 401 certification, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an excursion above water quality standards in the receiving water.

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an excursion above the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

Once a WLA is developed, EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix G.

C. Facility-Specific Limits

pH

The most stringent water quality criteria for pH are for the protection of aquatic life uses. The "aquatic life" pH criteria state that the pH must be no less than 6.5 and no greater than 9.0 standard units.

The permittee has collected pH and alkalinity data for the effluent. EPA obtained pH and alkalinity data for the receiving water from the USGS monitoring station at the outlet from Lake Coeur d'Alene into the Spokane River. EPA has used these data to determine the discharge's effects on the pH of the receiving water. EPA believes that a mixing zone for pH is appropriate. The proposed pH limits are 6.4 to 9.0 from November through March, 6.2 to 9.0 from April through June, and 6.5 to 9.0 from July through October. If IDEQ does not grant a mixing zone for pH in its final CWA Section 401 certification, EPA will change the pH limits to a range of 6.5 to 9.0 standard units, thus requiring that the pH criteria be met before the effluent is discharged to the receiving water. See Appendix E for effluent limit calculations for pH.

Total Residual Chlorine

EPA has retained the water quality-based chlorine effluent limits in the 1999 permit under the anti-backsliding provisions of Sections 402(o) and 303(d)(4) of the Clean Water Act, except during the month of October. EPA determined that the October through June chlorine effluent limits in the 1999 permit are not protective of water quality standards during the month of October. However, the July through September chlorine effluent limits in the 1999 permit are protective of water quality standards during the month of October. Therefore, the 1999 permit's July through September chlorine effluent limits have been extended to apply from July through October.

Total Phosphorus

EPA has determined that the phosphorus in the permitted discharge, together with the discharges from the City of Post Falls and the Hayden Area Regional Sewer Board, has the reasonable potential to cause or contribute to water quality standards nonattainment for dissolved oxygen in the State of Washington, downstream of the discharge. EPA has calculated water quality-based effluent limits for total phosphorus which are protective of dissolved oxygen criteria in Washington. See Appendix C for a complete discussion on the calculation of water quality-based effluent limits for total phosphorus.

Ammonia

EPA has determined that a discharge in compliance with the ammonia effluent limits in the 1999 permit will not cause or contribute to excursions above water quality standards for ammonia in the near field during the season which they were effective (July – September). EPA has also determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for ammonia in the near or far fields from November through February.

However, EPA has determined that, from March through October, the ammonia in the City of Coeur d'Alene's effluent, together with that from the City of Post Falls and the Hayden Area Regional Sewer board, does have the reasonable potential to cause or contribute to water quality standards nonattainment for dissolved oxygen and pH at the State Line and dissolved oxygen in Lake Spokane. EPA has determined that, if the ammonia effluent limits that had been effective from July through September were made to be effective from March through October, a discharge in compliance with those effluent limits will not cause or contribute to water quality standards nonattainment for ammonia, pH, or dissolved oxygen in the near or far fields. Therefore, the 1999 permit's ammonia effluent limits that had been effective only between July and September are now effective between March and October. See Appendix C for a complete discussion on the calculation of water quality-based effluent limits for total ammonia as N.

Five-Day Carbonaceous Biochemical Oxygen Demand

As stated above, EPA has promulgated technology-based effluent limits for $CBOD_5$. The technology-based limits apply from November through February.

However, EPA has determined that, from March through October, more stringent effluent limits are necessary to prevent the discharge from causing water quality standards nonattainment for dissolved oxygen the State of Washington. See Appendix C for a complete discussion on the calculation of water quality-based effluent limits for $CBOD_5$.

Metals

EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for zinc and, at times, silver. The effluent limits for these metals were recalculated based on current water quality criteria and effluent variability, and are more stringent than those in the 1999 permit. See Appendix G for details of the calculation of water quality-based effluent limits for metals.

E. Coli

The water quality criteria for E. Coli that are currently in effect for Clean Water Act purposes in Idaho include a geometric mean and a single sample maximum criterion. The State of Idaho has adopted revised water quality standards that do not include a single sample maximum criterion for E. Coli. However, EPA is required by Section 301(b)(1)(C) of the Act to include effluent limitations necessary to meet approved water quality standards. Therefore, the permit contains effluent limits for E. coli that apply approved water quality criteria (both the geometric mean and single sample maximum) at the end-of-pipe.

Total Suspended Solids

The total suspended solids effluent limits in the permit are technology-based effluent limits based on the requirements of 40 CFR 133.102(b). The State of Idaho has a narrative water quality criterion for sediment (IDAPA 58.01.02.200.08). Other sources provide appropriate numeric limits and targets for suspended sediment. Suggested limits for suspended sediment have been developed by the European Inland Fisheries Advisory Commission and the National Academy of Sciences, and have been adopted by the State of Idaho in previous TMDLs. A limit of 25 mg/L of suspended sediment provides a high level of protection of aquatic organisms; 80 mg/L moderate protection; 400 mg/L low protection; and over 400 mg/L very low protection (USDA FS 1990, Thurston et al. 1979).

The maximum projected receiving water concentration of total suspended solids under critical discharge conditions is 10.4 mg/L. In this case, critical conditions means using 25% of the summer 7Q10 river flow for mixing, effluent concentration set equal to the technology-based average weekly limit (45 mg/L), effluent flow set equal to the design flow, and upstream sediment concentration set equal to the 95^{th} percentile measured in the Spokane River at the lake outlet (USGS Station #12417598). The maximum projected receiving water concentration is much less than 25 mg/L, a concentration that provides a high level of protection of aquatic organisms. Therefore, the technology-based TSS limit is adequate to protect water quality.

D. References

U.S. Department of Agriculture Forest Service (USDA FS). 1990. *Salmonid-habitat Relationships in the Western United States: A Review and Indexed Bibliography*. USDA Forest Service. General Technical Report RM-188. Fort Collins, CO. Rocky Mountain Forest and Range Experiment Station, USDA FS.

Thurston R.V., R.C. Russo, C.M. Fetterolf, T.A. Edsall, Y.M. Barber Jr., editors. 1979. *Review of the EPA Red Book: Quality Criteria for Water*. Bethesda, MD. Water Quality Section, American Fisheries.

Appendix E: Reasonable Potential Calculations

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to an excursion above Idaho's federally approved water quality standards for certain pollutants. EPA uses the process described in Section 3.3 of the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential.

To determine if there is reasonable potential for the discharge to cause or contribute to an excursion above water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This section discusses how the maximum projected receiving water concentration is determined.

A. Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_dQ_d = C_eQ_e + C_uQ_u \quad \text{(Equation E-1)}$$

where,

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e = Maximum projected effluent concentration
C_u = 95th percentile measured receiving water upstream concentration
Q_d = Receiving water flow rate downstream of the effluent discharge = $Q_e + Q_u$
Q_e = Effluent flow rate[1]
Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_eQ_e + C_uQ_u}{Q_e + Q_u} \quad \text{(Equation E-2)}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream and that 100% of the stream flow is available for mixing. However, the Idaho water quality standards restrict the percentage of the stream flow that may be allowed for dilution of the effluent. When the mixing zone uses less than 100% of the stream flow, the equation becomes:

$$C_d = \frac{C_eQ_e + C_u(Q_u \times MZ)}{Q_e + (Q_u \times MZ)} \quad \text{(Equation E-3)}$$

[1] The 1999 permit contained effluent limitations which were tiered based on effluent flow. EPA has retained these flow tiers in the draft permit. Therefore, when calculating the maximum projected receiving water concentration for pollutants which had had effluent limits tiered based on the effluent flow rate, the effluent flow has been set equal to both 6.0 mgd (the design flow of the treatment plant) or 4.2 mgd.

where MZ is the fraction of the receiving water flow available for dilution. In this case, pursuant to Section 060.01.e.iv of the Idaho WQS, the mixing zone is not to exceed 25% of the volume of the stream flow and MZ is equal to 25% (.25).

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \text{(Equation E-4)}$$

Because the concentrations of cadmium, lead and zinc, in the Spokane River exceed the water quality criteria for these metals at times, dilution cannot be considered when determining reasonable potential and calculating effluent limits for these pollutants. The criteria for the metals of concern are expressed as dissolved metal. However, effluent limits for metals in NPDES permits must be expressed as total recoverable metal. The dissolved criterion must be converted to an equivalent total recoverable concentration by using a conversion factor, as shown in Equation E-5:

$$C_d = CF \times C_e \qquad \text{(Equation E-5)}$$

Equation E-3 can be simplified by introducing a “dilution factor,”

$$D = \frac{Q_e + 0.25 \times Q_u}{Q_e} \qquad \text{(Equation E-6)}$$

For each season of the year, there are six values for the dilution factor: two based on the 1Q10 flow rate in the receiving stream and used to determine reasonable potential and wasteload allocations for acute aquatic life criteria, two based on the 7Q10 flow rate to determine reasonable potential and wasteload allocations chronic aquatic life criteria (except for ammonia) and conventional pollutants, and two more based on the 30B3 flow rate to determine reasonable potential and wasteload allocations for the chronic ammonia criterion. Dilution factors were calculated with the effluent flow rate set equal either to the design flow of 6.0 mgd or to 4.2 mgd. The two effluent flow rates result in two dilution factors for each receiving water flow rate under consideration. This results in a total of 24 different dilution factors under consideration. The dilution factors are listed in Table E-1, below.

Table E-1: Dilution Factors

Season	**Effluent Flow (mgd)**	**Acute Dilution Factor** (1Q10)	**Chronic Dilution Factor** (7Q10)	**Chronic Ammonia Criterion Dilution Factor** (30B3)
November – March	6.0	24.7	27.8	41.1
April – June	6.0	55.9	68.3	120
July – October	6.0	6.28	8.94	11.2
November – March	4.2	34.8	39.3	58.3
April – June	4.2	79.5	97.2	171
July – October	4.2	8.54	12.3	15.5

After the dilution factor simplification, Equation E-2 becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{(Equation E-7)}$$

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as shown in Equation E-8, which applies when a mixing zone may be granted for a metal with criteria expressed as dissolved metal.

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \qquad \text{(Equation E-8)}$$

In equation E-8, Ce is expressed as total recoverable metal and Cd and Cu are expressed as dissolved metal. Equations E-5, E-7, and E-8 are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

For zinc, chlorine, ammonia, and silver, EPA has used the maximum daily effluent limits in the 1999 permit as the maximum projected effluent concentrations. This allows EPA to determine if the effluent limits in the 1999 permit are stringent enough to prevent the discharge from causing or contributing to excursions above water quality standards for these pollutants. If a discharge at the maximum daily limits in the 1999 permit did not have the reasonable potential to cause or contribute to excursions above water quality standards, EPA retained the 1999 effluent limits under the anti-backsliding provisions of the Act. In some cases, the reasonable potential analysis showed that a discharge at the 1999 permit's maximum daily limits would have the reasonable potential to cause or contribute to excursions above water quality standards, but when EPA re-calculated effluent limits based on current water quality criteria and effluent variability, the resulting effluent limits were less stringent than those in the 1999 permit. EPA has retained the effluent limits in the 1999 permit in that case as well.

To calculate the maximum projected effluent concentration for pollutants not subject to effluent limitations in the 1999 permit, EPA has used the procedure described in section 3.3 of the TSD, "Determining the Need for Permit Limits with Effluent Monitoring Data." In this procedure, the 99^{th} percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation. For pollutants that were subject to effluent limits in the 1999 permit, EPA has used the 1999 permit's maximum daily limit as the maximum projected effluent concentration.

Since there are a limited number of data points available in most case, the 99^{th} percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99^{th} percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6.

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for cadmium as an example. Reasonable potential calculations for all pollutants can be found in Table E-2.

The data set contains 136 cadmium samples collected from the effluent, therefore:

$p_n = (1-0.99)^{1/136}$
$p_n = 0.967$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 96th percentile.

The reasonable potential multiplier (RPM) is the ratio of the 99th percentile concentration (at the 99% confidence level) to the maximum reported effluent concentration. This is calculated as follows:

$RPM = C_{99}/C_p$ (Equation E-9)

Where,
$C = \exp(z\sigma - 0.5\sigma^2)$ (Equation E-10)

Where,
$\sigma^2 = \ln(CV^2 + 1)$ (Equation E-11)
$\sigma = \sqrt{\sigma^2}$
CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of cadmium:

CV = coefficient of variation = 0.408
$\sigma^2 = \ln(CV^2 + 1) = 0.154$
$\sigma = \sqrt{\sigma^2} = 0.392$
z = 2.326 for the 99th percentile = 1.1.834 for the 90th percentile

$C_{99} = \exp(2.326 \times 0.392 - 0.5 \times 0.154) = 2.31$
$C_{96} = \exp(1.285 \times 0.392 - 0.5 \times 0.154) = 1.90$

$RPM = C_{99} \div C_{96} = 2.31 \div 1.82$
RPM = 1.21

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$C_e = (RPM)(MRC)$ (Equation E-12)

where MRC = Maximum Reported Concentration

In the case of cadmium,

$C_e = (1.21)(0.23\ \mu g/L) = 0.28\ \mu g/L$

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to excursion above water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant. The maximum projected receiving water concentration is calculated from Equation E-7:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{(Equation E-7)}$$

Or, if a mixing zone is allowed and the criterion is expressed as dissolve metal, the maximum projected receiving water concentration is calculated from Equation E-8:

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \qquad \text{(Equation E-8)}$$

Or, if no mixing zone is allowed and the criterion is expressed as dissolved metal, the maximum projected receiving water concentration is calculated from Equation E-5:

$$C_d = CF \times C_e \qquad \text{(Equation E-5)}$$

Where C_e is expressed total recoverable metal, C_d is expressed as dissolved metal, and CF is the conversion factor.

For cadmium, the maximum projected receiving water concentration is, for the acute condition:

$$C_d = 0.932 \times 0.28 = 0.26$$

And for the chronic condition:

$$C_d = 0.897 \times 0.28 = 0.25$$

The acute and chronic water quality criteria for cadmium are 2.64 and 1.27 µg/L, respectively. The projected receiving water concentrations are less than the criteria, therefore, water quality-based effluent limits are not necessary for cadmium.

Tables E-2 and E-3, on the following pages, summarize the reasonable potential calculations for cadmium, lead, zinc, chlorine and ammonia. Note that the ammonia reasonable potential analysis shown in Table E-3 is only relevant to the question of whether the discharge has the reasonable potential to cause or contribute to excursions above Idaho's water quality criteria for ammonia at the edge of the mixing zone. For a discussion of the reasonable potential analysis and effluent limit calculation for ammonia to protect water quality standards for dissolved oxygen and pH in waters of the State of Washington, see Appendix C.

Table E-2: Reasonable Potential Calculations for Metals for Which no Mixing Zone is Authorized			
Values Common to All Parameters			
Confidence Level	0.99		
Z-Score of Confidence Level	2.33		
	Parameters		
	Cadmium	**Zinc**	**Lead**
Data Source	Effluent	Prev. Lim	Effluent
Maximum Reported Effluent Conc. (metals as TR)	0.23	N/A	6.53
Average Effluent Conc. (Metals as TR)	0.092		0.81
Standard Deviation of Effluent Conc. (Metals as TR)	0.037		0.64
Number of samples (n)	136		146
Coefficient of Variation (CV, assume 0.6 if n<10)	0.408		0.790
Sigma	0.392		0.70
Sigma^2	0.154		0.485
Percentile of Largest Value	0.967		0.969
Z-Score of Percentile of Largest Value	1.834		1.866
C99	2.31		3.97
Cn	1.902		2.878
Reasonable Potential Multiplier (RPM)	1.213		1.379
Maximum Projected Effluent Conc. (Metals as TR)	**0.279**	**200.8**	**9.00**
Acute Translator	0.932	0.881	0.147
Chronic Translator	0.897	0.881	0.147
Maximum Acute RWC (Metals as Dis)	0.260	177	1.32
Maximum Chronic/Single Value RWC (Metals as Dis)	0.250	177	1.32
Acute Aquatic Life Criterion (Metals as Dis)	2.64	148	87.3
Chronic Aquatic Life Criterion (Metals as Dis)	1.27	149	3.40
Most Stringent Single-Value Criterion (Metals as TR)	N/A	N/A	N/A
Reasonable Potential?	**NO**	**YES**	**NO**

Table E-3: Reasonable Potential Calculations for Pollutants for which a Mixing Zone May Be Authorized							
Values Common to All Parameters							
Confidence Level	0.99						
Z-Score of Confidence Level	2.33						
	Parameters						
	Chlorine	**Chlorine**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Sliver**	**Silver**
Data Source	Prev. Lim. July – Sep	Prev. Lim. Oct – June	Effluent	Prev. Lim. July – Sep > 4.2 mgd	Prev. Lim. July – Sep < 4.2 mgd	Prev. Lim Oct – June < 4.2 mgd	Effluent
Maximum Reported Effluent Conc. (metals as TR)			25.05				8.68
Average Effluent Conc. (Metals as TR)			8.92				1.39
Standard Deviation of Effluent Conc. (Metals as TR)			4.18				1.51
Number of samples (n)			377				146
Coefficient of Variation (CV, assume 0.6 if n<10)	N/A	N/A	0.468	N/A	N/A	N/A	1.087
Sigma			0.45				0.88
Sigma^2			0.198				0.780
Percentile of Largest Value			0.988				0.969
Z-Score of Percentile of Largest Value			2.253				1.866
C99			2.55				5.28
Cn			2.470				3.518
Reasonable Potential Multiplier (RPM)			1.033				1.502
Maximum Projected Effluent Conc. (Metals as TR)	**102**	**390**	**25.9**	**21.0**	**29.0**	**31.9**	**13.0**
Nov – March (>4.2 mgd)							
Ambient Concentration (Metals as Dis)		0	0.05	0.05		0	0
Acute Conversion Factor		1	1	1		0.518	0.518
Chronic Conversion Factor		1	1	1		N/A	
Maximum Acute RWC (Metals as Dis)		15.808	1.097	0.899		0.670	0.274
Maximum Chronic/Single Value RWC (Metals as Dis)	N/A	14.018	0.678	0.559	N/A	N/A	
Acute Aquatic Life Criterion (Metals as Dis)		19	9.32	9.32		0.32	0.32
Chronic Aquatic Life Criterion (Metals as Dis)		11	3.50	3.50		N/A	
Most Stringent Single-Value Criterion (Metals as		N/A	N/A	N/A		N/A	N/A

Table E-3: Reasonable Potential Calculations for Pollutants for which a Mixing Zone May Be Authorized							
Values Common to All Parameters							
Confidence Level	0.99						
Z-Score of Confidence Level	2.33						
	Parameters						
	Chlorine	**Chlorine**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Sliver**	**Silver**
Data Source	Prev. Lim. July – Sep	Prev. Lim. Oct – June	Effluent	Prev. Lim. July – Sep > 4.2 mgd	Prev. Lim. July – Sep < 4.2 mgd	Prev. Lim Oct – June < 4.2 mgd	Effluent
TR)							
Reasonable Potential?	**N/A**	**YES**	**NO**	**NO**	**N/A**	**YES**	**NO**
April - June (>4.2 mgd)							
Ambient Concentration (Metals as Dis)		0.00	0.05	0.05		0	0
Acute Conversion Factor		1	1	1		0.518	0.518
Chronic Conversion Factor		1	1	1		N/A	N/A
Maximum Acute RWC (Metals as Dis)		6.972	0.512	0.425		0.295	0.121
Maximum Chronic/Single Value RWC (Metals as Dis)	N/A	5.708	0.265	0.225	N/A	N/A	N/A
Acute Aquatic Life Criterion (Metals as Dis)		19	9.32	9.32		0.32	0.32
Chronic Aquatic Life Criterion (Metals as Dis)		11	3.33	3.33		N/A	N/A
Most Stringent Single-Value Criterion (Metals as TR)		N/A	N/A	N/A		N/A	N/A
Reasonable Potential?	**N/A**	**NO**	**NO**	**NO**	**N/A**	**NO**	**NO**
July - Oct (>4.2 mgd)							
Ambient Concentration (Metals as Dis)	0	0	0.05	0.05		0	0
Acute Conversion Factor	1	1	1	1		0.353	0.353
Chronic Conversion Factor	1	1	1	1			
Maximum Acute RWC (Metals as Dis)	11.404	43.603	4.165	3.387		1.794	0.733
Maximum Chronic/Single Value RWC (Metals as Dis)	9.146	34.970	2.367	1.928	N/A		
Acute Aquatic Life Criterion (Metals as Dis)	19	19	9.32	9.32		0.62	0.62
Chronic Aquatic Life Criterion (Metals as Dis)	11	11	2.01	2.01			
Most Stringent Single-Value Criterion (Metals as TR)	N/A	N/A	N/A	N/A		N/A	N/A
Reasonable Potential?	**NO**	**YES**	**YES**	**NO**	**N/A**	**YES**	**YES**
Nov - March (<4.2 mgd)							

Table E-3: Reasonable Potential Calculations for Pollutants for which a Mixing Zone May Be Authorized							
Values Common to All Parameters							
Confidence Level	0.99						
Z-Score of Confidence Level	2.33						
	Parameters						
	Chlorine	**Chlorine**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Sliver**	**Silver**
Data Source	Prev. Lim. July – Sep	Prev. Lim. Oct – June	Effluent	Prev. Lim. July – Sep > 4.2 mgd	Prev. Lim. July – Sep < 4.2 mgd	Prev. Lim Oct – June < 4.2 mgd	Effluent
Ambient Concentration (Metals as Dis)			0.05		0.05		0
Acute Conversion Factor			1		1		0.518
Chronic Conversion Factor			1		1		
Maximum Acute RWC (Metals as Dis)			0.792		0.833		0.194
Maximum Chronic/Single Value RWC (Metals as Dis)	N/A	N/A	0.493	N/A	0.497	N/A	
Acute Aquatic Life Criterion (Metals as Dis)			9.32		9.32		0.32
Chronic Aquatic Life Criterion (Metals as Dis)			3.50		3.50		
Most Stringent Single-Value Criterion (Metals as TR)			N/A		N/A		N/A
Reasonable Potential?	**N/A**	**N/A**	**NO**	**N/A**	**NO**	**N/A**	**NO**
April – June (<4.2 mgd)							
Ambient Concentration (Metals as Dis)			0.05		0.05		0
Acute Conversion Factor			1		1		0.518
Chronic Conversion Factor			1		1		
Maximum Acute RWC (Metals as Dis)			0.375		0.365		0.085
Maximum Chronic/Single Value RWC (Metals as Dis)	N/A	N/A	0.201	N/A	0.170	N/A	
Acute Aquatic Life Criterion (Metals as Dis)			9.32		9.32		0.32
Chronic Aquatic Life Criterion (Metals as Dis)			3.33		3.33		
Most Stringent Single-Value Criterion (Metals as TR)			N/A		N/A		N/A
Reasonable Potential?	**N/A**	**N/A**	**NO**	**N/A**	**NO**	**N/A**	**NO**
July - Oct (<4.2 mgd)							
Ambient Concentration (Metals as Dis)	N/A	N/A	0.05	N/A	0.05	N/A	0
Acute Conversion Factor			1		1		0.353

Table E-3: Reasonable Potential Calculations for Pollutants for which a Mixing Zone May Be Authorized

Values Common to All Parameters							
Confidence Level	0.99						
Z-Score of Confidence Level	2.33						
	Parameters						
	Chlorine	**Chlorine**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Ammonia (mg/L)**	**Sliver**	**Silver**
Data Source	Prev. Lim. July – Sep	Prev. Lim. Oct – June	Effluent	Prev. Lim. July – Sep > 4.2 mgd	Prev. Lim. July – Sep < 4.2 mgd	Prev. Lim Oct – June < 4.2 mgd	Effluent
Chronic Conversion Factor			1		1		
Maximum Acute RWC (Metals as Dis)			3.075		3.396		0.539
Maximum Chronic/Single Value RWC (Metals as Dis)			1.716		1.871		
Acute Aquatic Life Criterion (Metals as Dis)			9.32		9.32		0.49
Chronic Aquatic Life Criterion (Metals as Dis)			2.01		2.01		
Most Stringent Single-Value Criterion (Metals as TR)			N/A		N/A		N/A
Reasonable Potential?	**N/A**	**N/A**	**NO**	**N/A**	**NO**	**N/A**	**YES**

D. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.

EPA. 2004. Fact Sheet for Modification of NPDES Permit Number ID-002285-3.

Appendix F: Effluent Limit Calculations for pH

The following table demonstrates how appropriate effluent limitations were determined for pH.

The pH at the edge of the mixing zone is a function of effluent and ambient pH, temperature, and alkalinity. The critical alkalinity is the minimum for the ambient water and the maximum for the effluent. The critical pHs for the lower pH limit are the minimum effluent pH limit and the 5th percentile ambient pH. The critical temperatures are the maximum ambient temperature and the 5th percentile effluent temperature for the low pH critical conditions. Once the ambient pH, temperature and alkalinity and effluent temperature and alkalinity were input into the spreadsheet, EPA adjusted the effluent pH in 0.1 standard unit intervals until the pH at the edge of the mixing zone was between 6.5 and 9.0 standard units, as required by the water quality standards. EPA did not evaluate effluent pHs above 9.0 standard units or below 6.0 standard units, because this is the range of the technology-based effluent limits for pH. EPA did not evaluate a "high pH" critical condition because the upper bound water quality criterion is the same as the upper bound of the technology-based effluent limits for pH (9.0 standard units).

Table F-1: Effluent Limit Calculations for pH, Low pH Critical Condition			
INPUT	Nov - Mar	April - June	July - Oct
DILUTION FACTOR AT MIXING ZONE BOUNDARY	27.8	68.3	8.94
UPSTREAM/BACKGROUND CHARACTERISTICS			
Temperature (deg C):	11.00	15.30	23.10
pH:	6.600	6.600	6.600
Alkalinity (mg CaCO3/L):	16.00	16.00	16.00
EFFLUENT CHARACTERISTICS			
Temperature (deg C):	11.3	10.1	10.1
pH:	**6.40**	**6.20**	**6.50**
Alkalinity (mg CaCO3/L):	168	168	168
OUTPUT			
1. IONIZATION CONSTANTS			
Upstream/Background pKa:	6.45	6.42	6.36
Effluent pKa:	6.46	6.46	6.46
2. IONIZATION FRACTIONS			
Upstream/Background Ionization Fraction:	0.58	0.60	0.63
Effluent Ionization Fraction:	0.46	0.35	0.52
3. TOTAL INORGANIC CARBON			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	27.45	26.51	25.24
Effluent Total Inorganic Carbon (mg CaCO3/L):	362.25	475.87	322.30
CONDITIONS AT MIXING ZONE BOUNDARY			
Temperature (deg C):	10.97	15.22	21.65
Alkalinity (mg CaCO3/L):	21.47	18.23	33.00
Total Inorganic Carbon (mg CaCO3/L):	39.49	33.09	58.47
pKa:	6.46	6.42	6.37
pH at Mixing Zone Boundary:	**6.5**	**6.5**	**6.5**

Appendix G: WQBEL Calculations – Two-Value Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs for silver, zinc, and chlorine are intended to protect two-value (acute and chronic) aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits then works through the calculations for the zinc WQBEL as an example. The calculations for all WQBELs based on aquatic life criteria are summarized in Table G-1.

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis (Equations E-6 and E-7). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation E-6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{(Equation G-1)}$$

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation F-2. In this case, the criteria translator (CT) is site specific. See the fact sheet for the 2004 modification of this NPDES permit for more information on the site-specific translators

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \text{(Equation G-2)}$$

Or, if no mixing zone is allowed, for metals with criteria expressed as the dissolved fraction:

$$C_e = WLA = C_d \div CT \qquad \text{(Equation G-3)}$$

In the case of zinc, for the acute criterion,

WLA_a = 148 µg/L ÷ 0.881
WLA_a = 168 µg/L

For the chronic criterion,

WLA_c = 149.5 µg/L ÷ 0.881
WLA_c = 170 µg/l

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\sigma) \qquad \text{(Equation G-4)}$$

$LTA_c = WLA_c \times \exp(0.5\sigma_4^2 - z\sigma_4)$ (Equation G-5)

where,

$\sigma^2 = \ln(CV^2 + 1)$
$\sigma = \sqrt{\sigma^2}$
$\sigma_4^2 = \ln(CV^2/4 + 1)$
$\sigma = \sqrt{\sigma_4^2}$
$z = 2.326$ for 99th percentile probability basis

In the case of zinc:

$\sigma^2 = \ln(0.244^2 + 1) = 0.056$
$\sigma = \sqrt{\sigma^2} = 0.237$
$\sigma_4^2 = \ln(0.244^2/4 + 1) = 0.014$
$\sigma = \sqrt{\sigma_4^2} = 0.120$
$z = 2.326$ for 99th percentile probability basis

Therefore,

$LTA_a = 168\ \mu g/L \times \exp(0.5 \times 0.056 - 2.326 \times 0.237)$
$LTA_a = 99.0\ \mu g/L$

$LTA_c = 170\ \mu g/L \times \exp(0.5 \times 0.014 - 2.326 \times 0.120)$
$LTA_c = 129\ \mu g/L$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below. For zinc, the acute LTA is more stringent.

B. Derive the maximum daily and average monthly effluent limits

Using the TSD equations, the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m\sigma - 0.5\sigma^2)$ (Equation G-6)
$AML = LTA \times \exp(z_a\sigma_n - 0.5\sigma_n^2)$ (Equation G-7)

where σ, and σ² are defined as they are for the LTA equations (G-2 and G-3) and,

$\sigma_n^2 = \ln(CV^2/n + 1)$
$\sigma = \sqrt{\sigma_n^2}$
$z_a = 1.645$ for 95th percentile probability basis
$z_m = 2.326$ for 99th percentile probability basis
n = number of sampling events required per month (minimum of 4)

In the case of zinc,

MDL = 99.0 µg/L × exp(2.326 × 0.237 - 0.5 × 0.056)
MDL = 168 µg/L

AML = 99.0 µg/L × exp(1.645 × 0.120 - 0.5 × 0.014)
AML = 120 µg/L

Table G-1, below, details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

Table G-1: Limits Based on 2-Value Aquatic Life Criteria – City of Coeur d'Alene

Statistical variables for permit limit calculation

		AML Prob'y Basis	MDL Prob'y Basis	LTA Prob'y Basis	# of Samples per Month	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	**Season**	*decimal*	*decimal*	*decimal*	*n*	*dimensionless*	*dimensionless*
Zinc	EOP	0.95	0.99	0.99	4	N/A	N/A
Silver	Nov.-Mar.	0.95	0.99	0.99	4	24.67	27.82
	July-Oct. (>4.2 mgd)	0.95	0.99	0.99	4	6.28	8.94
	July-October (<4.2 mgd)	0.95	0.99	0.99	4	8.54	12.35

Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations

		WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	Limiting LTA
Parameter	**Season**	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*decimal*	*µg/L*
Zinc	EOP	168	170	99.0	129	0.244	99.0
Silver	Nov.-Mar.	15.14	N/A	2.87	N/A	1.087	2.87
	July-Oct. (>4.2 mgd)	11.10	N/A	2.10	N/A	1.087	2.10
	July-Oct. (<4.2 mgd)	11.76	N/A	2.23	N/A	1.087	2.23

Effluent Limit Calculation Summary

		Metal Criteria Translator		Amb. Conc	Water Quality Criterion Acute	Water Quality Criterion Chronic	**Avg. Monthly Limit (AML)**	**Max. Daily Limit (MDL)**	**Avg. Monthly Limit (AML)**	**Max. Daily Limit (MDL)**
Parameter	**Season**	Acute	Chronic	*µg/L*	*µg/L*	*µg/L*	***µg/L***	***µg/L***	***lb/day***	***lb/day***
Zinc	EOP	0.881	0.881	N/A	148.3	149.5	**120**	**168**	**6.01**	**8.42**
Silver	Nov.-Mar.	0.518	N/A	0.00	0.32	N/A	**5.82**	**15.1**	**0.291**	**0.758**
	July-Oct. (>4.2 mgd)	0.353	N/A	0.00	0.62	N/A	**4.26**	**11.1**	**0.213**	**0.555**
	July-Oct. (<4.2 mgd)	0.353	N/A	0.00	0.49	N/A	**4.52**	**11.8**	**0.23**	**0.59**

Notes:
1. EOP means end-of-pipe. Limits are not influenced by dilution in the receiving water ant are therefore the same year-round.

Appendix H: Endangered Species Act

A. Introduction

The U.S. Environmental Protection Agency (EPA) has evaluated the potential impacts to federally listed endangered or threatened species that could result from the reissuance of National Pollutant Discharge Elimination System (NPDES) permits to the City of Coeur d'Alene Wastewater Facility in Coeur d'Alene, Idaho, the City of Post Falls Wastewater Treatment Plant in Post Falls, Idaho, and the Hayden Area Regional Sewer Board (HARSB) Wastewater Treatment Plant in Rathdrum, Idaho. The receiving water for all three dischargers is the Spokane River, a tributary of the Columbia River. The designated uses of the receiving water are cold water aquatic life, salmonid spawning, and primary contact recreation.

Under the consultation process in Section 7 of the Endangered Species Act, federal agencies are required to prepare a biological evaluation (BE) to identify any potential impacts on endangered or threatened species resulting from federal permitting activities, and to consult with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries if the federal action may affect endangered or threatened species or critical habitat. In this case, EPA has determined that the discharges that the proposed permits for the City of Coeur d'Alene and the Hayden Area Regional Sewer Board would authorize may affect, but are not likely to adversely affect bull trout and will have no effect on bald eagle. EPA has determined that the reissuance of the City of Post Falls NPDES permit will have no effect on any threatened or endangered species.

B. Status of Species and Critical Habitat

According to USFWS, the following ESA-listed species are present in the vicinity of the discharges. See species list reference numbers 1-9-05-SP-0040, 1-9-05-SP-0041 and 1-9-05-SP-0042.

Listed Threatened:

- Bull trout
- Bald Eagle

Critical Habitat

- Designated critical habitat for Bull Trout (Coeur d'Alene Lake)[1]

C. Description of how the Environmental Baseline Would Be Affected

In general, the effluent limits in the proposed permits are as stringent as or more stringent than those in the 1999 permits, with the exception of the maximum daily limits for zinc and mass effluent limits for TSS, ammonia (winter) and zinc in the Hayden permit. EPA has removed the prohibition on discharges from the Hayden Area Regional Sewer Board between June 1 and September 30th when river flows are less than 2,000 CFS, allowing HARSB to discharge year-round regardless of the river flow rate. However, the HARSB permit proposes stringent effluent limits between June and September that are derived from and comply with the water quality

[1] This critical habitat designation is listed for information purposes only. All of the discharges are located downstream from Lake Coeur d'Alene, in the Spokane River, which is not designated critical habitat for bull trout.

standards of both affected States. Idaho DEQ has not authorized a schedule of compliance for any effluent limits in the HARSB permit in effect between June 1st and September 30th when river flows are less than 2,000 CFS (the circumstances under which HARSB's 1999 permit prohibited discharge to the Spokane River). Since HARSB cannot comply with the more stringent effluent limits without making capital improvements to the wastewater treatment plant, the proposed permit would effectively prohibit discharge from the HARSB treatment plant during low river flows in the summer until these improvements can be completed.

Since reissuance of the permits will, in general, either not change the currently permitted discharges, or will require reductions in those discharges, these actions are generally unlikely to cause degradation of water quality and associated impacts on listed species.

D. Summary of Determinations

Reissuance of NPDES permits to the City of Coeur d'Alene the Hayden Area Regional Sewer Board may affect but is not likely to adversely affect bull trout and will have no effect on bald eagles. Reissuance of an NPDES permit to the City of Post Falls will have no effect on any threatened or endangered species. Table H-1, below, summarizes the effects determinations for the specific species and pollutants considered by this BE for the City of Coeur d'Alene and the Hayden Area Regional Sewer Board.

Table H-1: Effects Determination Summary for the City of Coeur d'Alene and the Hayden Area Regional Sewer Board

Pollutant	Bald Eagle	Bull Trout
TSS, Sediment and Turbidity	No effect	Not likely to adversely affect
Chlorine	No effect	Not likely to adversely affect
Ammonia	No effect	Not likely to adversely affect
pH	No effect	Not likely to adversely affect
Carbonaceous Biochemical Oxygen Demand and Phosphorus	No effect	Not likely to adversely affect
Temperature	No effect	Not likely to adversely affect
Metals	No effect	Not likely to adversely affect
Bacteria	No effect	No effect
Overall effects determination	**No Effect**	**Not likely to adversely affect**

Table H-2, below, summarizes the effects determinations for the City of Post Falls:

Table H-2: Effects Determination Summary for the City of Post Falls

Pollutant	Bald Eagle	Bull Trout
TSS, Sediment and Turbidity	No effect	No Effect
Chlorine	No effect	No effect
Ammonia	No effect	No effect
pH	No effect	No effect
Carbonaceous Biochemical Oxygen Demand and Phosphorus	No effect	No effect
Temperature	No effect	No effect
Metals	No effect	No effect
Bacteria	No effect	No effect
Overall effects determination	**No Effect**	**No Effect**

E. Effects of State, Tribal, Local and Private Actions

The State of Washington, Department of Ecology has prepared two draft total maximum daily loads (TMDLs) for the Spokane River. One TMDL will address dissolved oxygen depletion in

Lake Spokane through load and wasteload allocations on phosphorus, ammonia, and carbonaceous biochemical oxygen demand, and the other will address PCBs.

The wasteload allocations for these pollutants for point sources are likely to result in stringent water quality-based effluent limits for these pollutants. The wasteload allocations for point sources in the draft DO TMDL range between 8 and 9 µg/L total phosphorus, between 1.2 and 2 mg/L $CBOD_5$, and between 14 and 30 µg/L ammonia (Merrill and Cusimano, 2004). The final TMDL may have slightly different wasteload allocations, but it is reasonable to assume that the final TMDL will require significant reductions in discharges of all of these pollutants from both point and nonpoint sources. The draft PCB TMDL proposes a 95% load reduction in PCBs at the Idaho border, a 97% load reduction in the Little Spokane River, and 99% reductions in municipal, industrial, and stormwater discharges in the State of Washington (Ecology, 2006). EPA expects that Ecology will grant the dischargers a schedule of compliance to meet effluent limits consistent with the wasteload allocations in the TMDLs, thus they will not be imposed for several years.

EPA expects that, over time, the environmental baseline in the action area will improve significantly in terms of nutrient enrichment, dissolved oxygen, and PCBs as a result of Ecology's TMDLs and EPA's NPDES permitting actions in the State of Idaho. Point source dischargers in both States are currently piloting treatment technologies in an effort to meet more stringent effluent limits, and are considering wastewater re-use in an effort to reduce the volume of wastewater discharged to the Spokane River.

F. Conclusions

The BE process concludes that the action of NPDES permit reissuance for the City of Coeur d'Alene and the Hayden Area Regional Sewer Board for point source discharges of pollutants to the Spokane River may effect, but are not likely to adversely affect bull trout and will not affect bald eagle. Reissuance of an NPDES permit to the City of Post Falls will not affect any threatened or endangered species.

For a complete discussion on the effects of the permitted discharges on threatened species, see the *Biological Evaluation for Reissuance of NPDES Permits to the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board* (EPA, 2007), which is part of the administrative record for this draft NPDES permit and is available from EPA Region 10 upon request.

G. References

EPA. 2007. *Biological Evaluation for Reissuance of NPDES Permits to the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board*. EPA Region 10. Office of Water and Watersheds.

Merrill, K. and B. Cusimano. 2004. *Draft Total Maximum Daily Load to Restore and Maintain Dissolved Oxygen in the Spokane River and Lake Spokane (Long Lake)*. Washington State Department of Ecology Water Quality Program. October 2004. Olympia, WA

Washington State Department of Ecology. 2006. Abstract for *Spokane River PCBs Total Maximum Daily Load Study (DRAFT Report)*. http://www.ecy.wa.gov/biblio/060324.html. Accessed 11/7/06.