United States
Environmental Protection
Agency
1200 6th Avenue
Suite 900 M/S OWW-130
Seattle, WA 98101

Fact Sheet

The U.S. Environmental Protection Agency (EPA)
Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

Kootenai-Ponderay Sewer District
Wastewater Treatment Plant

Public Comment Start Date: June 9, 2017
Public Comment Expiration Date: July 10, 2017

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

The EPA Proposes to Reissue NPDES Permit
The EPA proposes to reissue the NPDES permit for 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

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

Idaho Department of Environmental Quality
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422

Public Comment
Persons wishing to comment on, or request a Public Hearing for the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to the EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting the 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, OWW-130
Seattle, Washington 98101
(206) 553-0523 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
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422

EPA Idaho Operations Office
950 W Bannock, Suite 900
Boise, ID 83702
(208) 378-5746

Table of Contents

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.
30Q5	30 day, 5 year low flow
AML	Average Monthly Limit
AWL	Average Weekly Limit
BA	Biological Assessment
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
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
FR	Federal Register
HUC	Hydrologic Unit Code
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
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 or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
P	Phosphorus
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
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
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

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

Kootenai-Ponderay Sewer District (KPSD)
Wastewater Treatment Plant (WWTP)
NPDES Permit # ID0021229

Physical Address:
511 Whiskey Jack Road
Sandpoint, ID 83864

Mailing Address:
P.O. Box 562
Kootenai, ID 83840

Contact:
Tanner Weisgram, Operations Manager

B. Permit History

The most recent NPDES permit for the KPSD WWTP was issued on November 30, 2001, became effective on January 5, 2002, and expired on January 5, 2007. An NPDES application for permit reissuance was submitted by the permittee on June 30, 2006. The EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

II. Facility Information

A. Treatment Plant Description

The KPSD owns, operates, and maintains a WWTP located near Kootenai, Idaho. The secondary treatment plant discharges treated municipal wastewater to an unnamed tributary to Boyer Slough. The collection system has no combined sewers. The facility serves a resident population of 2,880. The design flow of the facility is 0.4 mgd. Treatment facilities consist of a bar rack, primary, secondary and polishing/storage lagoons, chlorination, and dechlorination.

The KPSD also holds a wastewater reuse permit (Permit # M-182-03) issued by the Idaho Department of Environmental Quality (IDEQ). The reuse permit became effective on June 25, 2013 and expires on June 25, 2023. The KPSD's land application site and storage lagoon are located about 0.75 mile north of State Highway 200 and the City of Kootenai at 48° 19' 32" north latitude and 116° 30' 25" west longitude. The proposed NPDES permit only authorizes the surface water discharge to the unnamed tributary to Boyer Slough.

A map showing the location of the treatment facility and discharge is included in Appendix A.

B. Compliance History

From 2011 – 2016, the KPSD has generally been in compliance with the effluent limits in the 2002 permit, with the following exceptions shown in Table 1, below.

Table 1: Effluent Limit Violations January 2011 – June 2016

Parameter	Statistic	Units	Number of Instances
E. coli	Instantaneous maximum	#/100 ml	2

III. Receiving Water

This facility discharges to an unnamed tributary to Boyer Slough near Sandpoint, Idaho. The outfall is located about 0.6 mile upstream (north) of Lake Pend Oreille.

A. Low Flow Conditions

The low flow conditions of a water body are used to assess the need for and develop water quality based effluent limits (see Appendix C of this fact sheet for additional information on flows).

The EPA used ambient flow data measured by the permittee, as a condition of the prior permit (see the 2002 permit at Page 5), to estimate the critical low flow conditions for the unnamed tributary to Boyer Slough, upstream from the point of discharge. The estimated 1Q10, 7Q10, 30Q5, and harmonic mean flows of the unnamed tributary to Boyer Slough, upstream from the point of discharge, are 0.12, 0.16, 0.17, and 0.34 CFS, respectively.

Between 1988 and 1993, the USGS operated a stream gauge (station # 12392660) on Sand Creek, which is another tributary to Lake Pend Oreille, located to the west of Boyer Slough. Since flow data are not available for the main stem of Boyer Slough, the EPA estimated the 30B3 flow rate of Boyer Slough (as opposed to the unnamed tributary that receives the discharge) based on the measured 30B3 flow rate of Sand Creek and the drainage areas of Sand Creek (at the stream gauge location) and Boyer Slough. The estimated 30B3 flow rate of Boyer Slough is 0.76 CFS.

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet water quality standards. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. 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 that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and 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.

Designated Beneficial Uses

This facility discharges to an unnamed tributary of Boyer Slough in the Pend Oreille Lake Subbasin, HUC (17010214). The unnamed tributary of Boyer Slough is designated for cold water aquatic life, salmonid spawning, primary contact recreation and domestic water supply. Boyer Slough and its tributaries have these designated uses because they are part of the Pend Oreille Lake waterbody unit P-18 (IDAPA 58.01.02.010.110 and 58.01.02.110.05).

In addition, the Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply, wildlife habitats and aesthetics (IDAPA 58.01.02.100.03.b and c, 100.04 and 100.05).

Surface Water Quality Criteria

The criteria are found in the following sections of the Idaho Water Quality Standards:

- The narrative criteria applicable to all surface waters of the State are found at IDAPA 58.01.02.200 (General Surface Water Quality Criteria).
- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at IDAPA 58.01.02.210 (Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use).
- Additional numeric criteria necessary for the protection of aquatic life can be found at IDAPA 58.01.02.250 (Surface Water Quality Criteria for Aquatic Life Use Designations).
- Numeric criteria necessary for the protection of recreation uses can be found at IDAPA 58.01.02.251 (Surface Water Quality Criteria for Recreation Use Designations).
- Water quality criteria for agricultural water supply can be found in the EPA's *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA R3-73-033) (See IDAPA 58.01.02.252.02)

The numeric and narrative water quality criteria applicable to Boyer Slough and the unnamed tributary that receives the discharge are provided in Appendix B of this fact sheet.

Antidegradation

The IDEQ has completed an antidegradation review which is included in the draft 401 certification for this permit. See Appendix F for the State's draft 401 water quality certification. The EPA has reviewed this antidegradation review and finds that it is consistent with the State's 401 certification requirements and the State's antidegradation implementation procedures. Comments on the 401 certification including the antidegradation review can be submitted to the IDEQ as set forth above (see State Certification).

C. Water Quality Limited Waters

Any waterbody for which the water quality does not, and/or is not expected to meet, applicable water quality standards is defined as a "water quality limited segment."

Section 303(d) of the Clean Water Act (CWA) requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited segments. A TMDL is a detailed analysis of the water body to determine its assimilative capacity. The assimilative capacity is the loading of a pollutant that a water body can assimilate without causing or contributing to a violation of water quality standards. Once the assimilative capacity of the water body has been determined, the TMDL will allocate that capacity among point and non-point pollutant sources, taking into account natural background levels and a margin of safety. Allocations for non-point sources are known as "load allocations" (LAs). The allocations for point sources, known as "waste load allocations" (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

The State of Idaho's 2012 Integrated Report ("Integrated Report") Section 5 (i.e. the "303(d) list") lists the aquatic life uses of Boyer Slough as impaired due to unknown causes, based on a benthic macroinvertebrate bioassessment.

The Integrated Report also lists the aquatic life and recreation uses of Lake Pend Oreille, downstream from the discharge, as impaired due to concentrations of methylmercury in fish tissue that exceed Idaho's fish tissue criterion of 0.3 mg/kg.

No TMDLs have been completed by the State of Idaho to address these impairments, and none of the effluent limitations proposed in the draft permit are based on TMDL wasteload allocations.

In 2002, IDEQ prepared and EPA approved a nutrient TMDL for the nearshore waters of Lake Pend Oreille, downstream from the discharge. The nearshore TMDL does not address impairments in Boyer Slough, and it does not assign a load allocation to nor account for nutrient loading from Boyer Slough or other tributaries to Lake Pend Oreille (IDEQ 2015).

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA 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 applicable to a waterbody are being met and may be more stringent than technology-based effluent limits. The basis for the effluent limits proposed in the draft permit is provided in Appendices D and E.

B. Proposed Effluent Limitations

The following summarizes the proposed effluent limits that are in the draft permit.

1. 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.
2. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of BOD_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.

Table 2 below presents the proposed effluent limits for BOD_5, TSS, *E. coli*, chlorine, ammonia, nitrate + nitrite, and total phosphorus.

Table 2: Proposed Final Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	—
	lb/day	86	129	—
	% removal	85% (min.)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	100	150	—
	% removal	85% (min.)	—	—
E. coli	#/100 ml	126 (geometric mean)	—	406 (instantaneous maximum)
Total Residual Chlorine	µg/L	9.6	—	19
	lb/day	0.032	—	0.063
Nitrate + Nitrite (as N)	mg/L	21.5	64.0	—
	lb/day	71.7	214	—
Total Ammonia (as N) (October – May)	mg/L	1.71	—	4.85
	lb/day	5.70	—	16.2
Total Ammonia (as N) (June – September)	mg/L	1.64	—	4.66
	lb/day	5.47	—	15.5
Total Phosphorus (as P) (June – September)	µg/L	9.0	18.0	—
	lb/day	0.030	0.060	—

C. Schedules of Compliance and Interim Limits

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 Idaho water quality standards allow for compliance schedules "when new limitations are in the permit for the first time." The proposed effluent limits for ammonia, nitrate + nitrite, and total phosphorus are new limits that are in the permit for the first time.

The federal regulation allows schedules of compliance "when appropriate," and requires that such schedules require compliance as soon as possible. When the compliance schedule is longer than 1 year, federal regulations require that 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. Federal regulations also require that interim effluent limits be at least as stringent as the final limits in the previous permit (40 CFR 122.44(l)(1)).

EPA policy states that, in order to grant a compliance schedule, a permitting authority must make a reasonable finding that the permittee cannot comply with the effluent limit immediately upon the effective date of the final permit (see the *US EPA NPDES Permit Writers' Manual* at Section 9.1.3). The EPA has determined that the KPSD cannot comply with the new water quality-based effluent limits for ammonia and phosphorus immediately upon the effective date of the final permit. Therefore, the draft permit proposes a schedule of compliance for the new ammonia and phosphorus effluent limits.

The proposed interim limits for June – September are specified in the State of Idaho's draft Clean Water Act Section 401 certification. The interim limits are expressed as monthly totals and are equal to the loading of ammonia and phosphorus that the facility would discharge in 10 days, if the effluent flow rate were equal to the design flow rate of 0.4 mgd and the concentrations of phosphorus and ammonia were equal to the maximum concentrations reported on the district's DMRs from February 2002 through July 2013. The interim limits will encourage KPSD to fully utilize its storage and reuse capacity, while still allowing KPSD to comply with the permit. Interim limits for June – September may be expressed as monthly totals instead of the average monthly and average weekly limits generally required for continuous discharges from POTWs (40 CFR 122.45(d)(1)), because the KPSD may not discharge continuously during June – September. Federal regulations at 40 CFR 122.45(e) address the expression of effluent limits for non-continuous discharges. Proposed June – September interim limits are 1,168 lb for ammonia and 282 lb for TP.

The proposed new water quality-based effluent limits for phosphorus only apply from June – September. Other than storage and re-use, the KPSD facility does not have any treatment processes that remove significant amounts of phosphorus or ammonia. Therefore, interim effluent limits are proposed only during June – September, when re-use is viable.

The EPA has determined that the KPSD can comply with the new water quality-based effluent limits for nitrate + nitrite immediately upon the effective date of the final permit. Therefore no compliance schedule may be authorized for the new water quality-based effluent limits for nitrate + nitrite.

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 DMRs or on the application for renewal, as appropriate, to the 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 must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

The permit also requires the permittee to perform effluent monitoring required by part B.6 of the NPDES Form 2A application[1], so that these data will be available when the permittee applies for a renewal of its NPDES permit. The required monitoring frequency for those pollutants listed in part B.6 of the application form, which are not subject to effluent limits (total Kjeldahl nitrogen, total dissolved solids, and oil and grease), is twice per year. This monitoring frequency will ensure that there are at least 10 results for these pollutants at the end of the permit cycle. If there are less than 10 data points available, the uncertainty is too large to calculate an average or a standard deviation with sufficient confidence (see the TSD at Page 53).

Table 3, below, presents the proposed effluent monitoring requirements for the KPSD WWTP. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 3: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	recording
Temperature	°C	Effluent	Continuous	recording
BOD_5	mg/L	Influent & Effluent	2/month	24-hour composite
	lb/day			calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	2/month	24-hour composite
	lb/day			calculation[1]
	% Removal	% Removal	1/month	calculation[2]
pH	standard units	Effluent	5/week	grab
E. Coli	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine	µg/L	Effluent	5/week	grab
	lb/day	Effluent		calculation[1]
Total Ammonia as N (October – May until 10 years after the effective date of the final permit)	mg/L	Effluent	1/month	24-hour composite
Total Ammonia as N (June – September until 10 years after the effective date of the final permit)	mg/L	Effluent	1/week	24-hour composite
	lb/month	Effluent		calculation[1]
Total Ammonia as N (Year-Round beginning 10 years after the effective date of the final permit)	mg/L	Effluent	1/week	24-hour composite
	lb/day	Effluent		calculation[1]
Nitrate + Nitrite as N	mg/L	Effluent	1/week	24-hour composite
	lb/day	Effluent		calculation[1]
Total Phosphorus as P (October – May)	mg/L	Effluent	1/month	24-hour composite
Total Phosphorus as P (June – September until 10 years after the effective date of the final permit)	mg/L	Effluent	1/week	24-hour composite
	lb/month	Effluent		calculation[1]

[1] See also Appendix J to 40 CFR 122.

Table 3: Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Phosphorus as P	mg/L	Effluent	1/week	24-hour composite
(June – September beginning 10 years after the effective date of the final permit)	lb/day	Effluent		calculation[1]
Dissolved Oxygen	mg/L	Effluent	1/month	grab
Total Kjeldahl Nitrogen	mg/L	Effluent	2/year	24-hour composite
Oil and Grease	mg/L	Effluent	2/year	24-hour composite
Total Dissolved Solids	mg/L	Effluent	2/year	24-hour composite
Total Mercury	µg/L	Effluent	1/quarter[3]	24-hour composite

Notes:
1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834.
2. Percent removal is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent.
3. Effluent monitoring for mercury is required for the final three full calendar years of the permit cycle.

Monitoring Changes from the Previous Permit

Monitoring frequencies for certain parameters have been reduced, relative to the previous permit. The reductions in monitoring frequency are based on the EPA's *Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies* (April 19, 1996). Table 4, below, summarizes the reductions in monitoring frequency that were made based on the guidance.

Table 4: Reductions in Monitoring Frequency			
Parameter	**Ratio of Long Term Average Discharge to Avg. Monthly Limit**	**2002 Permit Monitoring Frequency**	**Reduced Monitoring Frequency**
BOD_5	38%	1/week	2/month
TSS	32%	1/week	2/month

Monitoring frequencies for ammonia, nitrate + nitrite, and total phosphorus have been increased relative to the 2002 permit, in order to determine compliance with the new water quality-based effluent limits for those parameters. Since a compliance schedule has been authorized for ammonia and total phosphorus, the monitoring frequencies have not been increased relative to the prior permit unless and until there is an effluent limit (either final or interim) in effect.

The prior permit did not require monitoring for dissolved oxygen. Monthly effluent monitoring of dissolved oxygen is proposed in the draft permit to determine if the discharge has the reasonable potential to cause or contribute to nonattainment of Idaho's water quality criteria for dissolved oxygen. Since the receiving water provides little physical dilution of the effluent, the effluent dissolved oxygen concentration is relevant, in addition to the BOD concentration and load. In addition, effluent data for dissolved oxygen are required in order to prepare a complete application.

Effluent monitoring for total mercury is proposed in order to determine if the discharge has the reasonable potential to cause or contribute to the excursions above Idaho's methylmercury fish tissue criterion of 0.3 mg/kg, which have been measured in Lake Pend

Oreille, downstream from the discharge. The required monitoring frequency for mercury is quarterly, for the final three full calendar years of the permit cycle. This monitoring frequency will ensure that there are at least 12 results for mercury at the end of the permit cycle. This will ensure that there will be enough mercury results to calculate an average and a standard deviation with sufficient confidence (see the TSD at Page 53).

The EPA proposes to increase the effluent temperature monitoring frequency from once per month in the prior permit to continuous in the reissued permit. Continuous effluent monitoring for temperature is required in order to determine if the discharge of heat has the reasonable potential to cause or contribute to excursions above water quality standards for temperature. The applicable water quality criteria for temperature are stated as maximum allowable daily average and daily maximum temperatures. Continuous monitoring for temperature will allow for accurate calculation of these statistics for the discharge.

C. Surface Water Monitoring

Table 5 presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted with the DMRs.

The primary purpose of the proposed surface water monitoring is to determine if additional or more-stringent effluent limits are necessary for dissolved oxygen, biochemical oxygen demand, or temperature, and to determine if phosphorus and/or total nitrogen limits are necessary outside of the June – September season. Surface water monitoring must occur during the final full calendar year of the permit term.

Table 5: Receiving Water Monitoring Requirements

Parameter and Units	Locations	Frequency	Sample Type
Flow (Unnamed arm of Boyer Slough, CFS)	Upstream	1/month	Measure
Flow (Boyer Slough, CFS)	Downstream	1/month	Measure
Dissolved Oxygen (mg/L)	Upstream	1/month	Grab
Dissolved Oxygen (mg/L)	Downstream	Continuous	Recording
Dissolved Oxygen (% saturation)	Downstream	Continuous	Recording
Temperature (°C)	Upstream & Downstream	Continuous	Recording
BOD_5 (mg/L)	Upstream & Downstream	1/month	Grab
Total Phosphorus (µg/L)	Downstream	1/month	Grab
Total Nitrogen (µg/L)	Downstream	1/month	Grab
Water column chlorophyll a (µg/L)	Downstream	1/month	Grab
Periphyton chlorophyll a (mg/m^2)	Downstream	1/month	See note 1
Secchi depth (m)	Downstream	1/month	Measure

Notes:
1. Field sampling procedures for periphyton chlorophyll a must be consistent with Section 6.1.1 of *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers* (EPA 841-B-99-002).

VI. Sludge (Biosolids) Requirements

The EPA Region 10 separates wastewater and sludge permitting. The EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. The 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 KPSD is required to update the Quality Assurance Plan for the KPSD WWTP within 90 days of the effective date of the final permit. The Quality Assurance Plan must include standard operating procedures the permittee will follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The Quality Assurance Plan requirements in the permit state that mercury samples must be collected using guidance provided in EPA Method 1669, *Sampling Ambient Water for Determination of Metals at EPA Ambient Criteria Levels* (EPA 1996) in order to avoid contamination of samples to be analyzed for mercury. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

B. Operation and Maintenance Plan

The permit requires the KPSD to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the final permit. The plan must be retained on site and made available to the EPA and the IDEQ upon request.

C. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet the EPA-approved state water quality standards.

The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system. The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6))

Written Reports – The permittee is required to provide the EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by the EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

E. Standard Permit Provisions

Sections III, IV and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. 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 requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA) and the U.S. Fish and Wildlife Service (FWS) if their actions could adversely affect any threatened or endangered species.

The EPA has determined that there are no listed species under the jurisdiction of NOAA in the vicinity of the discharge; therefore, the issuance of this proposed permit will have no effect on listed species under NOAA's jurisdiction.

FWS listed bull trout as threatened in the vicinity of the outfall. The EPA has prepared a biological evaluation and has determined that discharges from the facility will have no effect on listed bull trout. Therefore, consultation is not required. The biological evaluation is available from the EPA 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 the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The EPA has determined that issuance of this permit will not adversely affect EFH in the vicinity of the discharge. Neither Boyer Slough, Lake Pend Oreille, nor the Pend Oreille River are designated as EFH. The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of this permit.

C. State Certification

Section 401 of the CWA requires the EPA to seek State 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, or treatment standards established pursuant to any State law or regulation.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. https://www3.epa.gov/npdes/pubs/owm0264.pdf

EPA. 1996. *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. US Environmental Protection Agency, Office of Water, Engineering and Analysis Division, Washington, DC. July 1996. https://www3.epa.gov/caddis/pdf/Metals_Sampling_EPA_method_1669.pdf

EPA. 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. US Environmental Protection Agency, Office of Water, EPA-841-B-99-002. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20004OQK.txt

EPA. 2010. *NPDES Permit Writers' Manual*. Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001. https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

IDEQ. 2015. *Nutrient TMDL for the Nearshore Waters of Lake Pend Oreille, Idaho: TMDL Five-Year Review*. June 2015. Coeur d'Alene, Idaho. http://www.deq.idaho.gov/media/60176823/nutrient-tmdl-nearshore-waters-lake-pend-oreille-tmdl-five-year-review.pdf

Appendix A: Map

Appendix B: Water Quality Criteria Summary

This appendix provides a summary of water quality criteria applicable to Boyer Slough and its unnamed tributary that receives the discharge.

Idaho water quality standards include criteria necessary to protect designated beneficial uses. The standards are divided into three sections: General Water Quality Criteria, Surface Water Quality Criteria for Use Classifications, and Site-Specific Surface Water Quality Criteria. The EPA has determined that the criteria listed below are applicable to Boyer Slough and its unnamed tributary. This determination was based on (1) the applicable beneficial uses (i.e., cold water aquatic life, salmonid spawning, primary contact recreation, domestic water supply, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics), (2) the type of facility, (3) a review of the application materials submitted by the permittee, and (4) the quality of the water in Boyer Slough and its unnamed tributary.

A. General Criteria (IDAPA 58.01.02.200)

Surface waters of the state shall be free from:

- hazardous materials,
- toxic substances in concentrations that impair designated beneficial uses,
- deleterious materials,
- radioactive materials,
- floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses,
- excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses,
- oxygen demanding materials in concentrations that would result in an anaerobic water condition

B. Numeric Criteria for Toxics (IDAPA 58.01.02.210)

This section of the Idaho Water Quality Standards provides the numeric criteria for toxic substances for waters designated for aquatic life, recreation, or domestic water supply use. Monitoring of the effluent has shown that the following toxic pollutants have been present at quantifiable levels in the effluent.

- Ammonia
- Chlorine (Total Residual)
- Nitrate[1]

C. Surface Water Criteria To Protect Aquatic Life Uses (IDAPA 58.01.02.250)

- pH: Within the range of 6.5 to 9.0

[1] The State of Idaho does not have numeric water quality criteria for nitrate, however, this pollutant has been measured in the discharge and has the reasonable potential to cause or contribute to excursions above Idaho's narrative water quality criteria for toxic pollutants.

- Total Dissolved Gas: <110% saturation at atm. pressure.
- Dissolved Oxygen:
  - During the time spawning and incubation occurs: One (1) day minimum of not less than six point zero (6.0) mg/l or ninety percent (90%) of saturation, whichever is greater.
  - When spawning and incubation is not occurring: Concentrations exceeding six (6) mg/l at all times.
- Temperature:
  - During the time spawning and incubation occurs: Water temperatures of thirteen (13) degrees C or less with a maximum daily average no greater than nine (9) degrees C.
  - When spawning and incubation is not occurring: Water temperatures of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C.
- Turbidity: Turbidity below any applicable mixing zone set by the Department shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than ten (10) consecutive days.

Ammonia

Ammonia criteria are based on a formula which relies on the pH and temperature of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. The table below details the equations used to determine water quality criteria for ammonia.

The KPSD collected pH and temperature data in Boyer Slough upstream and downstream of the facility from March 2002 – February 2003. These data were used to determine the appropriate pH and temperature values to calculate the ammonia criteria.

As with any natural water body, the pH and temperature of the water will vary over time. Therefore, to protect water quality criteria it is important to develop the criteria based on pH and temperature values that will be protective of aquatic life at all times.

The EPA used the maximum downstream pH of 8.1 standard units for the ammonia criteria calculations. No seasonal variation was assumed for pH. The maximum temperature for June – September is 18 °C and the maximum temperature for October – May is 9 °C. The values of the ammonia criteria calculated from these values are shown in Table B-1, below.

Table B-1: Water Quality Criteria for Ammonia

	Acute Criterion[1]	Chronic Criterion[2]
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times 10^{0.028\times(25-T)}\right)$
Oct. – May	4.63	2.10
June – Sep.	4.63	1.68

D. Surface Water Quality Criteria For Recreational Use Designations (IDAPA 58.01.02.251)

- Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain *E. coli* in concentrations exceeding a geometric mean of 126

E. coli organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30 day period.

- Use of Single Sample Values: A water sample exceeding the *E. coli* single sample maximums below indicates likely exceedance of the geometric mean criterion but is not alone a violation of water quality standards. If a single sample exceeds the maximums set forth…
- For waters designated as primary contact recreation, a single sample maximum of 406 *E. coli* organisms per100 ml. at any time.

Appendix C: Low Flow Conditions and Dilution

A. Low Flow Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits. In general, Idaho's water quality standards require criteria be evaluated at the following low flow receiving water conditions (See IDAPA 58.01.02.210.03) as defined below:

Table C-1: Critical Low Flow Rates	
Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3, 30Q10 or 30Q5

1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 1B3 is biologically based and indicates an allowable exceedance of once every 3 years.
3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years.
5. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
7. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Idaho's water quality standards do not specify a low flow to use for acute and chronic ammonia criteria, however, the EPA's *Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia; Notice* (64 FR 71976, December 22, 1999) identifies the appropriate flows to be used. For the 30-day average chronic aquatic life criterion for ammonia in fresh water, the 30B3 biologically-based low flow rate is recommended, but the 30Q5 or 30Q10 hydrologically-based flow rates are at least as protective as the 30B3 and may be used instead of the 30B3 (see 64 FR 71976). The EPA has used the 30Q5 flow rate in this case.

The EPA estimated the critical low flows upstream from the point of discharge from flow data measured by the KPSD, as a condition of the 2002 permit (see the 2002 permit at Page 5). The estimated low flows for the station are presented in Table C-2 below.

Table C-2: Critical Flows of Unnamed Tributary to Boyer Slough Upstream from the KPSD Discharge	
Flows	**CFS**
1Q10	0.12
7Q10	0.16
30Q5	0.17
Harmonic Mean	0.34

Because IDEQ authorized a mixing zone encompassing 100% of the flow of the main stem of Boyer Slough for nitrate + nitrite, the EPA also estimated the 30B3 flow rate of Boyer Slough. Between 1988 and 1993, the USGS operated a stream gauge (station # 12392660) on Sand Creek, which is another tributary to Lake Pend Oreille, located to the west of Boyer Slough. Since flow data are not available for the main stem of Boyer Slough, the EPA estimated the 30B3 flow rate of Boyer Slough (as opposed to its unnamed tributary that receives the discharge)

by first calculating the 30B3 flow rate of Sand Creek, then scaling the 30B3 of Sand Creek by the ratio of the drainage areas of Sand Creek and Boyer Slough. Normally, the EPA would use the 30Q5 flow rate to determine dilution for nitrate + nitrite. There are not enough data available to calculate the 30Q5 flow rate of Sand Creek; however, there are enough data to calculate the 30B3. The 30B3 and 30Q5 flow rates are considered equally protective (64 FR 71976). The 30B3 flow rate of Sand Creek is 3.48 CFS.[1] The drainage area of Boyer Slough, estimated using the USGS StreamStats tool, is 8.04 square miles. The drainage area of Sand Creek at the USGS gauging station (#12392660) is 36.6 square miles. Therefore, the 30B3 flow rate of Boyer Slough is estimated as follows:

$$3.48 \text{ CFS} \times (8.04 \text{ mi}^2 \div 36.6 \text{ mi}^2) = 0.76 \text{ CFS}$$

B. Mixing Zones and Dilution

In some cases a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and where certain numeric water quality criteria may be exceeded (EPA 2014). The federal regulations at 40 CFR 131.13 states that "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances."

The Idaho Water Quality Standards at IDAPA 58.01.02.060 provides Idaho's mixing zone policy for point source discharges. The policy allows the IDEQ to authorize a mixing zone for a point source discharge after a biological, chemical, and physical appraisal of the receiving water and the proposed discharge.

The following formula is used to calculate a dilution factor based on the allowed mixing.

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e}$$

Where:

D	=	Dilution Factor
Q_e	=	Effluent flow rate (set equal to the design flow of the WWTP)
Q_u	=	Receiving water low flow rate upstream of the discharge (1Q10, 7Q10, 30B3, etc.)
%MZ	=	Percent Mixing Zone

The IDEQ proposes to authorize 25% mixing zone for ammonia and chlorine. The EPA calculated dilution factors for year round critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.4 mgd. The dilution factors are listed in Table C-2.

Consistent with IDEQ's mixing zone authorization, 100% of Boyer Slough's estimated 30B3 flow rate was used to determine dilution for nitrate + nitrite.

[1] There were also enough data to calculate the 30Q4 (30-day, 4-year) low flow rate of Sand Creek. The 30Q4 flow rate is 3.67 CFS. Other factors being equal, the 30Q5 flow rate of a given stream will be less than the 30Q4 flow rate. Thus, the fact that the 30B3 flow rate (3.48 CFS) is less than the 30Q4 flow rate (3.67 CFS) shows that the 30B3 flow rate is a reasonable substitute for the 30Q5 flow rate in this case.

Table C-3: Dilution Factors		
Flows	**Associated Criteria**	**Dilution Factor**
1Q10	Acute aquatic life	1.05
7Q10	Chronic aquatic life (except ammonia)	1.06
30Q5 (unnamed tributary to Boyer Slough, 25% mixing zone)	Chronic ammonia	1.07
30B3 (Boyer Slough, 100% mixing zone)	Nitrate + nitrite (human health, non-carcinogen)	2.23

C. References

EPA. 2014. *Water Quality Standards Handbook Chapter 5: General Policies*. Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014. https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

Appendix D: Basis for Effluent Limits

The following discussion explains the derivation of technology and water quality based effluent limits proposed in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, Part C discusses anti-backsliding provisions, Part D discusses the effluent limits imposed due to the State's anti-degradation policy, and Part E presents a summary of the facility specific limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated "secondary treatment" effluent limitations, which 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 application of secondary treatment in terms of BOD_5, TSS, and pH. 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	—
TSS	30 mg/L	45 mg/L	—
Removal Rates for BOD_5 and TSS	85% (minimum)	—	—
pH	—	—	6.0 - 9.0 s.u.

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]

Since the design flow for this facility is 0.4 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 0.4 mgd × 8.34 = 100 lbs/day

Average Weekly Limit = 45 mg/L × 0.4 mgd × 8.34 = 150 lbs/day

The TSS effluent limits proposed in the draft permit are the technology-based effluent limits described above. The concentration and removal rate effluent limits for BOD_5 are the

[1] 8.34 is a conversion factor equal to the density of water in pounds per gallon.

technology-based effluent limits described above. However, as explained below, the mass loading (lb/day) limits for BOD_5 are more stringent than the technology-based limits.

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44(l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provide limited exceptions.

The 2002 permit continued forward the BOD_5 loading limits that were in the 1984 permit. It does not appear from the 1983 fact sheet and the 1981 State of Idaho staff evaluation that the BOD_5 effluent loading limits in the 1984 permit were based on state standards.

According to section 7.2.2 of the EPA permit writers' manual, the anti-backsliding regulations at 40 CFR 122.44(l) are applicable to effluent limits other than those based on state standards. This regulation states that effluent limits in a reissued permit must be at least as stringent as the final effluent limitations in the previous permit unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under 40 CFR 122.62. Furthermore, any revised effluent limits would need to ensure compliance with water quality standards for dissolved oxygen (40 CFR 122.4(d), 122.44(d)(1), CWA Section 301(b)(1)(C)).

The circumstances on which the previous permit was based have not materially or substantially changed since the time the permit was issued. Furthermore, there are no dissolved oxygen (DO) data available for the effluent or the receiving water, and no BOD data for the receiving water. Therefore, there are insufficient data to determine if the BOD_5 effluent loading (lb/day) limits could be revised to be consistent with the technology-based limits described above, while still ensuring compliance with water quality standards. Therefore, the BOD_5 loading (lb/day) limits from the 1984 and 2002 permits have been retained in the draft permit. These are an average monthly limit of 86 lb/day and an average weekly limit of 129 lb/day. The permittee has generally been in compliance with these effluent limits since 2002, except for one violation of the average weekly limit in May 2004.

The draft permit proposes effluent and receiving water monitoring requirements for DO, BOD_5, and temperature. These data will be used to determine if revisions to the BOD_5 effluent limits are appropriate when the permit is reissued.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The KPSD WWTP uses chlorine disinfection.

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. For technology-based effluent limits, 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.

Since the federal regulations at 40 CFR 122.45 (b) and (f) require limitations for POTWs to be expressed as mass based limits using the design flow of the facility, mass based limits for chlorine are calculated as follows:

Monthly average Limit= 0.5 mg/L x 0.4 mgd x 8.34 = 1.67 lbs/day

Weekly average Limit = 0.75 mg/L x 0.4 mgd x 8.34 = 2.50 lbs/day

The 2002 permit included more stringent water quality-based effluent limits for chlorine. Water quality based effluent limits are proposed for chlorine in the draft permit as well.

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 that does not 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, and 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.

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 the pollutant parameters in the effluent 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/Tribal water quality criterion, the EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from 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 pollutant, 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.

Sometimes it may be 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 will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body.

Mixing zones must be authorized by the State. The IDEQ's draft certification proposes to authorize a mixing zone of 25 percent of the receiving water flow volume for the following parameters:

- Total residual chlorine
- Total ammonia as N

In addition, 100% of the flow of Boyer Slough is used to calculate dilution for nitrate + nitrite.

If IDEQ does not grant the mixing zones in its final certification of this permit, the water quality-based effluent limits will be re-calculated 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 exceedance of water quality standards in the receiving water. Wasteload allocations are determined in one of the following ways:

1. TMDL-Based Wasteload Allocation

   Where the receiving water quality does not meet water quality standards, the wasteload allocation is generally based on a TMDL developed by the State. A TMDL is a determination of the amount of a pollutant from point, non-point, and natural background sources that may be discharged to a water body without causing the water body to exceed the criterion for that pollutant. Any loading above this capacity risks violating water quality standards.

   There are no TMDLs that include wasteload allocations for the KPSD WWTP. Thus, no effluent limits in the draft permit are calculated from TMDL-based wasteload allocations. However, there is an approved TMDL for nutrients in the nearshore waters of Lake Pend Oreille, downstream from the discharge.

2. Mixing zone based WLA

   When the State authorizes a mixing zone for the discharge, the WLA is calculated by using a simple mass balance equation. The equation takes into account the available dilution provided by the mixing zone, and the background concentrations of the pollutant. The WLAs for ammonia, chlorine, and nitrate + nitrite were derived using a mixing zone.

3. Criterion as the Wasteload Allocation

   In some cases a mixing zone cannot be authorized, either because the receiving water is already at, or exceeds, the criterion, the receiving water flow is too low to provide

dilution, or the facility can achieve the effluent limit without a mixing zone. In such cases, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the effluent discharge will not contribute to an exceedance of the criteria. The WLAs for E. coli, pH and phosphorus were derived using this method.

Once the wasteload allocation has been developed, the EPA applies the statistical permit limit derivation approach described in Chapter 5 of the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001, March 1991, hereafter referred to as the TSD) to obtain monthly average, and weekly average or daily maximum permit limits. This approach takes into account effluent variability, sampling frequency, and water quality standards.

Summary - Water Quality-based Effluent Limits

The water quality based effluent limits in the draft permit are summarized below.

Phosphorus

As explained below, EPA has determined that the TP in the discharge has the reasonable potential to cause or contribute to excursions above Idaho's narrative water quality criterion for nutrients from June – September.

Limiting Nutrient

Both nitrogen and phosphorus can contribute to violations of WQS that result from excess nutrients (i.e., nuisance algae or aesthetics, DO, and pH). Liebig's Law of the Minimum states that the nutrient that is less abundant relative to the biological requirements of algae is the limiting nutrient (i.e., the nutrient that controls primary productivity) (EPA 1972). Phosphorus is generally the limiting nutrient in freshwaters. This is because blue-green algae can "fix" elemental nitrogen from the air as a nutrient source or utilize nitrogen in the water column at very low concentrations and thereby grow in a low-nitrogen environment (EPA 1999). Several studies have concluded that phosphorus is the nutrient most likely limiting algae growth in Lake Pend Oreille, downstream from the discharge (Tetra Tech 2002).

To determine the limiting nutrient in Boyer Slough, the EPA considered the nitrogen-to-phosphorus (N:P) mass ratio. If the ratio is less than 7.2:1, total nitrogen is the most likely limiting nutrient; otherwise, total phosphorus is the most likely limiting nutrient (EPA 1999). The estimated N:P mass ratios, based on receiving water data submitted by the permittee, were 78:1 upstream of the discharge and 8.5:1 downstream of the discharge. Therefore, TP is the most likely limiting nutrient in both Boyer Slough and Lake Pend Oreille.

Interpretation of the Narrative Criterion for Nutrients

The State of Idaho has a narrative water quality criterion for nutrients which reads, "surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses." Where a State or Tribe has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State or Tribal water quality standard, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi).

EPA is establishing water quality-based effluent limits for TP based on 40 CFR 122.44(d)(1)(vi)(A), which allows the permitting authority to establish effluent limits using a calculated numeric water quality criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use.

The EPA has determined that the average TP concentration target of 9 µg/L from the Total Maximum Daily Load for Nutrients for the Nearshore Waters of Pend Oreille Lake, Idaho ("Nearshore TMDL") is the appropriate value to interpret Idaho's narrative criterion for nutrients for the purposes of determining reasonable potential and, if necessary, for calculating effluent limits for TP. This interpretation of the narrative nutrient criterion is valid from June – September, which is the period of time during which the Nearshore TMDL establishes concentration targets and load allocations for TP.

The 9 µg/L average target is from an Idaho document: the Nearshore TMDL. The EPA believes this concentration is reasonable because it is less than EPA's effects based criteria from *Quality Criteria for Water 1986*, which are 50 µg/L for streams flowing into lakes or impoundments and 25 µg/L within the lake or reservoir. It is also very close to the EPA's more recent recommendation of 8.8 µg/L for lakes and reservoirs in aggregate nutrient ecoregion II (EPA 2000). As discussed below, phosphorus concentrations upstream of the discharge are relatively high (maximum 60 µg/L), so Boyer Slough does not have the capacity to dilute discharges of phosphorus before such discharges reach Lake Pend Oreille, where the TMDL target applies. Therefore, the EPA believes 9 µg/L of TP will be protective of both Boyer Slough and Lake Pend Oreille.

The 9 µg/L target from the Nearshore TMDL applies from June – September. The Nearshore TMDL does not establish nutrient targets or allocations for the October – May time frame.

The EPA has required year-round monitoring of the effluent for total phosphorus and total nitrogen, and receiving water monitoring for total phosphorus, total nitrogen, dissolved oxygen, pH, as well as chlorophyll a in both the water column and in periphyton.

There is no EPA-approved analytical method for chlorophyll-a in 40 CFR Part 136. Therefore, monitoring must be conducted using a test procedure specified in the permit (40 CFR 122.44(i)(1)(iv)(B)). The permit specifies the use of EPA Methods 445.0, 446.0 or 447.0 for chlorophyll-a.

These data will allow the EPA to determine if effluent limits for nutrients are necessary from October – May, when this permit is reissued.

Ambient Concentration

The KPSD sampled the receiving water for TP upstream and downstream from the discharge. Upstream from the discharge, all but one of the 12 results were less than the practical quantification limit (PQL) of 50 µg/L. The single result that was greater than the 50 µg/L PQL was 60 µg/L. The EPA has used maximum likelihood estimation to estimate the average upstream concentration based on the available data. The estimated average upstream TP concentration is 33 µg/L. This is higher than the 9 µg/L interpretation of Idaho's narrative criterion for nutrients. Therefore, the receiving water cannot provide dilution of KPSD's discharge of TP. The 9 µg/L interpretation of Idaho's narrative nutrient criterion must be applied at the end-of-pipe, without allowing for dilution (i.e., a mixing zone).

Downstream from the discharge, all but one of the 12 samples for TP were greater than the PQL. The average TP concentration measured downstream from the discharge was 1,730 µg/L, and the maximum TP concentration was 2,800 µg/L. In the *Nutrient TMDL for the Nearshore Waters of Lake Pend Oreille, Idaho: TMDL Five-Year Review*, IDEQ concluded that the TMDL's target for total phosphorus has not been met in the northern region of the lake, where Boyer Slough is located (IDEQ 2015).

Reasonable Potential

Federal regulations require that effluent limitations in NPDES permits "must control all pollutants or pollutant parameters…which…are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality (40 CFR 122.44(d)(1)(i))."

Reasonable potential analyses may account for the dilution of the effluent in the receiving water, where appropriate (40 CFR 122.44(d)(1)(ii)). However, as explained above, the concentration of phosphorus upstream from the discharge is higher than the interpreted narrative criterion. Therefore, the receiving water cannot provide dilution of the phosphorus in the effluent and dilution may not be considered in the reasonable potential analysis.

The prior permit required effluent monitoring for TP once per month. The average effluent concentration of TP measured between January 2012 and March 2017 is 5,146 µg/L, and the maximum concentration is 7,620 µg/L. Because dilution may not be considered in this reasonable potential analysis and the discharge concentration is greater than the interpreted narrative criterion, the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for nutrients. Therefore, EPA must establish effluent limits for total phosphorus in the permit (40 CFR 122.44(d)(1)(i – iii)).

Furthermore, the maximum measured concentration of TP in the unnamed tributary to Boyer Slough, downstream from the discharge, is 2,800 µg/L, even though the maximum measured upstream concentration is 60 µg/L. Thus, the ambient water quality data demonstrates that the WWTP contributes to high phosphorus concentrations in the receiving water.

Wasteload Allocation

According to Section 6.2.1.2 of the 2010 *U.S. EPA Permit Writers' Manual* and Section 5.4 of the TSD, wasteload allocations need not be established by a total maximum daily load (TMDL), but may instead be calculated for an individual point source as part of the permitting process. The wasteload allocation is the amount of phosphorus that the permittee may discharge, while ensuring a level of water quality that is derived from and complies with all applicable water quality standards (40 CFR 122.44(d)(1)(vii)(A)).

Because dilution may not be considered in this case due to concentrations of TP upstream from the discharge that exceed the interpreted narrative criterion, the WLA is equal to the interpreted narrative criterion.

$$C_e = WLA = C_d = 9\ \mu g/L$$

Translating the Wasteload Allocation to Effluent Limits

NPDES regulations at 40 CFR 122.45(f) require effluent limits in NPDES permits to be expressed in terms of mass, and states that "pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to

comply with both limitations." Section 5.7.1 of the TSD states that the EPA "recommends that permit limits on both mass and concentration be specified for effluents discharging into waters with less than 100 fold dilution." Because there is less than 100-fold dilution in this case, the permit proposes both mass and concentration limits for TP.

NPDES regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits unless impracticable.

In this case, the interpretation of the narrative criterion, and, in turn, the wasteload allocation, is a seasonal average concentration. However, the season lasts only four months. The EPA has set the average monthly limit equal to the 9 µg/L TP WLA. This is somewhat conservative, because it is possible that the average discharge over a four-month period could be 9 µg/L or less, even if the average discharge within a particular month is greater than 9 µg/L.

Consistent with 40 CFR 122.45(d)(2), EPA has also established an average weekly discharge limitation for TP, in addition to the average monthly discharge limitation. To calculate the average weekly limit, the EPA used Table 5-3 of the *Technical Support Document for Water Quality-based Toxics Control*. This table provides ratios between the average monthly and the maximum daily limit, however, when the required sampling frequency is once per week or less frequent, there is no practical difference between an average weekly limit and a maximum daily limit. The draft permit proposes a sampling frequency of once per week for TP. Attainment of the proposed average monthly effluent limits for TP will require upgrades to the POTW. Therefore, the historic effluent variability for TP may not be representative of future effluent variability. Therefore, the EPA has assumed that the CV is equal to 0.6, consistent with the recommendation of the TSD when effluent data are not available (see TSD at Page E-3). The EPA has used the 95th percentile probability basis for the average monthly limit and the 99th percentile probability basis for the average weekly limit. This results in a ratio between the average monthly and average weekly limit of 2.01:1. Therefore, the average weekly limit is 18 µg/L (9 µg/L × 2.01 = 18 µg/L).

Nitrate + Nitrite

The Idaho WQS do not include numeric criteria for nitrate + nitrite. However, the State of Idaho does have a narrative water quality criterion for toxic substances, which reads "surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses" (IDAPA 58.01.02.200.2). Where a State or Tribe has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State or Tribal water quality standard, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi). The EPA is establishing water quality-based effluent limits for nitrate + nitrite based on 40 CFR 122.44(d)(1)(vi)(B), which allows the permitting authority to establish effluent limits using EPA's water quality criteria, published under Section 304(a) of the CWA.

The EPA-recommended water quality criterion for nitrate for the consumption of water and organisms is 10 mg/L (EPA 1986). EPA has used this recommended criterion to interpret the State of Idaho's narrative water quality criterion for toxic substances.

The EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above the 10 mg/L criterion. The reasonable potential analysis specifically considered the effluent concentration of nitrate. However, in oxygenated natural water systems, nitrite is rapidly oxidized to nitrate (EPA 1986). Therefore, the permit contains a water quality-based effluent limit for nitrate + nitrite.

Consistent with the recommendations of section 5.4.4 of the TSD for establishing effluent limits based on human health criteria, the average monthly limit has been set equal to the wasteload allocation of 21.5 mg/L.

NPDES regulations require that effluent limitations for POTWs that discharge continuously be expressed as average monthly and average weekly discharge limitations, unless impracticable (40 CFR 122.45(d)(2)). Therefore, in addition to the average monthly limit, the permit proposes an average weekly limit for nitrate + nitrite. To calculate the average weekly limit, EPA used the equation printed Table 5-3 of the TSD. This table provides ratios between the average monthly and the maximum daily limit, however, when the required sampling frequency is once per week or less frequent, there is no practical difference between an average weekly limit and a maximum daily limit. The draft permit proposes a sampling frequency of once per week for nitrate + nitrite. The CV for the effluent nitrate + nitrite concentration is 1.69. The EPA has used the 95th percentile probability basis for the average monthly limit and the 99th percentile probability basis for the average weekly limit. This results in a ratio between the average monthly and average weekly limit of 2.97:1. Therefore, the average weekly limit is 21.5 mg/L × 2.97 = 64.0 mg/L.

Ammonia

As shown in Appendix E, a reasonable potential calculation showed that the KPSD WWTP discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia. In addition, ammonia concentrations as high as 19 mg/L have been measured in the unnamed tributary to Boyer Slough, downstream from the discharge. This concentration exceeds Idaho's water quality criteria for ammonia. Therefore, the draft permit contains a water quality-based effluent limit for ammonia.

See Appendix E for reasonable potential and effluent limit calculations for ammonia.

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values of the receiving water to be within the range of 6.5 to 9.0.

The facility was required to monitor the effluent pH as a condition of the prior permit. From January 2012 – March 2017, the minimum effluent pH measured was 6.7 standard units and the maximum pH measured was 8.5 standard units. The effluent data indicate that the facility can comply with Idaho's water quality criteria for pH at point of discharge. Therefore, no mixing zone is proposed for pH, and the pH effluent limits require a range of 6.5 – 9.0 standard units at all times.

E. coli

The Idaho water quality standards state that waters of the State of Idaho, that are designated for recreation, are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100

ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho water quality standards also state that a water sample that exceeds certain "single sample maximum" values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. For waters designated for primary contact recreation, the "single sample maximum" value is 406 organisms per 100 ml (IDAPA 58.01.02.251.01.b.ii.).

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent. Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, the EPA has imposed an instantaneous (single grab sample) maximum effluent limit for *E. coli* of 406 organisms per 100 ml, in addition to a monthly geometric mean limit of 126 organisms per 100 ml, which directly implements the water quality criterion for *E. coli*. This will ensure that the discharge will have a low probability of exceeding water quality standards for *E. coli*.

Regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. Additionally, the terms "average monthly limit" and "average weekly limit" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Chlorine

The prior permit included water quality-based effluent limits for chlorine.

When the EPA recalculated water quality-based effluent limits for chlorine based on the water quality criteria and the dilution available in the unnamed tributary, the EPA determined that the average monthly chlorine effluent limits in the prior permit are not stringent enough to ensure compliance with water quality criteria for chlorine. Therefore, the EPA has calculated more-stringent water quality-based average monthly effluent limits for chlorine. The maximum daily limit for chlorine in the 2002 permit is adequately stringent to ensure compliance with water quality criteria and has been continued forward in the draft permit.

Residues

The Idaho water quality standards require that surface waters of the State be free from floating, suspended or submerged matter of any kind in concentrations impairing designated beneficial uses. The draft permit contains a narrative limitation prohibiting the discharge of such materials.

Temperature

At this time, the EPA does not have sufficient data to determine whether or not the discharge of heat has the reasonable potential to cause or contribute to excursions above water quality standards for temperature. The permit proposes continuous monitoring of the effluent and the receiving waters, for temperature.

C. Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. An anti-degradation analysis was conducted by the IDEQ. See Appendix F for the antidegradation analysis.

D. References

EPA. 1972. *Glossary of Aquatic Ecological Terms*. Office of Water Programs. EPA-850-B-72-001. Revised February 1972.
https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9100ULPU.txt

EPA. 1986. *Quality Criteria for Water 1986*. Environmental Protection Agency. Office of Water. Regulations and Standards. Washington, DC. May 1, 1986. EPA-440-5-86-001.
https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=00001MGA.txt

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.
https://www3.epa.gov/npdes/pubs/owm0264.pdf

EPA. 1999. *Protocol for Developing Nutrient TMDLs*. EPA 841-B-99-007. November 1999.
http://nepis.epa.gov/Exe/ZyPDF.cgi/20004PB2.PDF?Dockey=20004PB2.PDF

EPA. 2000. *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria: Lakes and Reservoirs in Nutrient Ecoregion II*. Environmental Protection Agency. Office of Water. EPA 822-B-00-007.
https://www.epa.gov/sites/production/files/documents/lakes2.pdf

EPA. 2010. *U.S. Environmental Protection Agency NPDES Permit Writers' Manual*. US Environmental Protection Agency. Office of Water. Office of Wastewater Management. EPA-833-K-10-001.
https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

IDEQ. 2015. *Nutrient TMDL for the Nearshore Waters of Lake Pend Oreille, Idaho: TMDL Five-Year Review*. June 2015. Coeur d'Alene, Idaho.
http://www.deq.idaho.gov/media/60176823/nutrient-tmdl-nearshore-waters-lake-pend-oreille-tmdl-five-year-review.pdf

Tetra Tech, Inc. 2002. *Total Maximum Daily Load (TMDL) for Nutrients for the Nearshore Waters of Pend Oreille Lake, Idaho*. April 2002.
http://www.deq.idaho.gov/media/464368-_water_data_reports_surface_water_tmdls_pend_oreille_lake_ns_pend_oreille_ns_nutrient_entire.pdf

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

Appendix E: Reasonable Potential and Water Quality-Based Effluent Limit Calculations

Part A of this appendix explains the process the EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Idaho's federally approved water quality standards. Part B demonstrates how the water quality-based effluent limits (WQBELs) in the draft permit were calculated.

A. Reasonable Potential Analysis

The EPA uses the process described in 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 exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality 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 following section discusses how the maximum projected receiving water concentration is determined.

Mass Balance

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

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{Equation 1}$$

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 (set equal to the design flow of the WWTP)
- 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:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \text{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)} \qquad \text{Equation 3}$$

Where:

% MZ = the percentage of the receiving water flow available for mixing.

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

$$C_d = C_e \qquad \text{Equation 4}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} \qquad \text{Equation 5}$$

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{Equation 6}$$

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991) recommends using the maximum projected effluent concentration (C_e) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (C_e) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (C_e) can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \qquad \text{Equation 7}$$

where,

p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}} \qquad \text{Equation 8}$$

Where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile)
Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)
CV = coefficient of variation (standard deviation ÷ mean)

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

$$C_e = (RPM)(MRC) \qquad \text{Equation 9}$$

where MRC = Maximum Reported Concentration

Reasonable Potential

The discharge has reasonable potential to cause or contribute to an exceedance of 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.

Results of Reasonable Potential Calculations

It was determined that the KPSD's discharge of chlorine, ammonia, nitrate + nitrite and total phosphorus have reasonable potential to cause or contribute to an exceedance of water quality criteria at the edge of the mixing zone. The results of the calculations are presented in Table E-1 of this appendix.

B. WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs for ammonia and chlorine are intended to protect aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits. The calculations for all WQBELs based on aquatic life criteria are summarized in Table E-2.

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 4 and 6). 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 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{Equation 10}$$

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 the EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \qquad \text{Equation 11}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \text{Equation 12}$$

where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile probability basis)
CV = coefficient of variation (standard deviation ÷ mean)
σ_4^2 = $\ln(CV^2/4 + 1)$

For ammonia, because the chronic criterion is based on a 30-day averaging period, the Chronic Long Term Average (LTA_c) is calculated as follows:

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \quad \text{Equation 13}$$

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

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

Derive the maximum daily and average monthly effluent limits

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

$$MDL = LTA \times e^{(z_m\sigma - 0.5\sigma^2)} \quad \text{Equation 14}$$

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)} \quad \text{Equation 15}$$

where σ, and σ^2 are defined as they are for the LTA equations above, and,

σ_n^2 = $\ln(CV^2/n + 1$
z_a = 1.645 (z-score for the 95th percentile probability basis)
z_m = 2.326 (z-score for the 99th percentile probability basis)
n = number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should be set at a minimum of 4. In the case of ammonia, the value of ''n'' should be set at a minimum of 30.

Table E-2, below, details the calculations for water quality-based effluent limits.

Table E-1: Reasonable Potential Calculations

Effluent Percentile value	99%																
				State Water Quality Standard		Max concentration at edge of...											
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	
Parameter	Acute	Chronic							*Pn*		*CV*	*s*	*n*				COMMENTS
Ammonia June - September (mg/L)	1.00	1.00	0.0400	4.63	1.68	45.43	44.58	YES	0.920	27.10	0.67	0.61	55	1.76	1.05	1.07	
Ammonia October - May (mg/L)	1.00	1.00	0.0400	4.63	2.10	45.43	44.74	YES	0.920	27.10	0.67	0.61	55	1.76	1.05	1.06	
Nitrate (mg/L)	1.00	1.00	0.6000		10		26.43	YES	0.920	19.90	1.69	1.16	55	2.92		2.23	
Chlorine (µg/L)	1.00	1.00				18.12	17.85	YES	N/A	19.00	N/A	N/A	N/A	1.00	1.05	1.06	Previous MDL
TP (mg/L)	1.00	1.00	0.0310		0.009		7.620	YES	N/A	7.62	N/A	N/A	N/A	1.00		1.00	

Table E-2: Effluent Limit Calculations – Aquatic Life Criteria

Statistical variables for permit limit calculation																		
LTA Probability Basis	99%		Dilution (Dil'n) factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone.															
MDL Probability Basis	99%																	
AML Probability Basis	95%																	
						Permit Limit Calculation Summary						**Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations**						
	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	Limiting LTA	Coeff. Var. (CV)	# of Samples per Month
PARAMETER			Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L		*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*n*
Ammonia June - September (mg/L)	1.05	1.07	1.00	1.00	0.0400	4.63	1.68	**1.64**	**4.66**		4.851	1.788	1.412	1.355	1.355	0.67	30.00
Ammonia October - May (mg/L)	1.05	1.06	1.00	1.00	0.0400	4.63	2.10	**1.71**	**4.85**		4.851	2.230	1.412	1.690	1.412	0.67	30.00
Chlorine	1.05	1.06	1.00	1.00		19.00	11.00	**9.6**	**19.2**		19.9	11.7	6.4	6.2	6.2	0.60	4.00

Table E-3: Effluent Limit Calculations: Nitrate + Nitrite and TP

Revised 3/00	Ambient Concentration	Water Quality Criteria	Max concentration at edge of chronic mixing zone.	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT	MAXIMUM DAILY EFFLUENT LIMIT	Coeff Variation		Dilution Factor
Parameter								*CV*	S	
Nitrate + Nitrite (mg/L)	0.60	10.00	26.43	YES	4	21.5	64.0	1.69	1.2	2.23
TP (µg/L)	33.0	9.0	7620	YES	4	9.0	18	0.60	0.6	1.00

C. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. https://www3.epa.gov/npdes/pubs/owm0264.pdf

Appendix F: Clean Water Act Section 401 Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814 • (208) 769-1422
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
John H. Tippets, Director

July 1, 2016

Mr. Michael Lidgard
US Environmental Protection Agency, Region 10
1200 6th Avenue, OW-130
Seattle, WA 98101

RE: Draft §401 Water Quality Certification for the Revised Draft NPDES Permit No. ID-0021229 for the Kootenai Ponderay Wastewater Treatment Plant

Dear Mr. Lidgard:

The State of Idaho Department of Environmental Quality (DEQ) received a revised preliminary draft NPDES permit in March 2014. Due to the possible regionalization opportunity, DEQ wanted to ensure that the compliance schedules for Kootenai Ponderay Sewer District and City of Sandpoint were compatible. This caused a considerable delay in providing this certification while details of the Sandpoint certification were finalized. Thank you for your patience.

After review of the draft permit and fact sheet, DEQ submits the enclosed draft §401 water quality certification which includes a narrative description of our antidegradation review for this permit and conditions necessary to meet these rules. After the public comment period ends, DEQ will address any comments, review the proposed final permit and issue a final certification decision.

Please direct any questions to June Bergquist at 208.666.4605 or june.bergquist@deq.idaho.gov .

Sincerely,

Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office

Enclosure

C: Nicole Deinarowicz, DEQ State Office
Brian Nickel, EPA Region 10, Seattle
Tanner Weisgram, Operator Kootenai Ponderay Sewer District

Printed on Recycled Paper

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

July 1, 2016

NPDES Permit Number(s): ID-0021229; Kootenai-Ponderay Wastewater Treatment Plant

Receiving Water Body: Unnamed tributary to Boyer Slough

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon its review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The Kootenai-Ponderay Sewer District Wastewater Treatment Plant (KPSD) discharges the following pollutants of concern: *BOD, TSS, E. coli*, chlorine, nitrate + nitrite, ammonia and phosphorus. Effluent limits have been developed for all pollutants of concern. There is no proposed increase in design flow for this facility.

Receiving Water Body Level of Protection

The KPSD discharges to an unnamed tributary of Boyer Slough within the Pend Oreille Lake Subbasin assessment unit (AU) 17010214PN018_02b (Boyer Slough). The unnamed tributary of Boyer Slough is designated for cold water aquatic life, salmonid spawning, primary contact recreation and domestic water supply. Boyer Slough and its tributaries have these designated uses because they are part of the Pend Oreille Lake waterbody unit P-18 (IDAPA 58.01.02.010.110 and 58.01.02.110.05). In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2012 Integrated Report, this AU is not fully supporting one or more of its assessed uses. The cold water aquatic life and salmonid spawning uses are not fully supported. Causes of impairment are not fully understood, but the impairment listing is based on low benthic-macroinvertebrate bioassessment scores. As such, DEQ will provide Tier 1 protection (IDAPA 58.01.02.051.01) for the aquatic life use.

The contact recreation beneficial use is unassessed in the 2012 Integrated Report, however monitoring data collected in 2015 indicates that this use is impaired and is shown as such in the draft 2014 Integrated Report. As a result, DEQ will provide Tier 1 protection only for the aquatic life use and recreation beneficial uses (IDAPA 58.01.02.051.01; 58.01.02.051.02).

Protection and Maintenance of Existing Uses (Tier 1 Protection)

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of designated beneficial uses. The effluent limitations and associated requirements contained in the

KPSD permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL.

A TMDL has not yet been developed for this AU; our estimate is that this watershed might be addressed in 2019 as part of the next five year review. Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04).

In summary, the effluent limitations and associated requirements contained in the KPSD permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS. Therefore, DEQ has determined the permit will protect and maintain existing beneficial uses in the unnamed tributary of Boyer Slough in compliance with the Tier 1 provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

Table 1. Comparison of current and proposed permit limits for pollutants of concern.

Pollutant	Units	Current Permit			Proposed Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Max. Daily Limit	Average Monthly Limit	Average Weekly Limit	Max. Daily Limit	
Pollutants with limits in both the current and proposed permit								
Five-Day BOD_5	mg/L	30	45	—	30	45	—	NC
	lb/day	86	129	—	86	129	—	
	% removal	85%	—	—	85%	—	—	
TSS	mg/L	30	45	—	30	45	—	NC
	lb/day	100	150	—	100	150	—	
	% removal	85%	—	—	85%	—	—	
pH	standard units	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	no./100 mL	126		406	126	—	406	NC
Total Residual Chlorine (final)	µg/L	11	—	19	9.6	—	19	D
	lb/day	—	—	—	0.032	—	0.063	
Pollutants with new limits in the proposed permit								
Nitrate + Nitrite	mg/L	—	—	—	21.5	56.2	—	D
	lb/day	—	—	—	71.7	187	—	D
Total Ammonia (October – May)	mg/L	—	—	—	2.51	—	4.85	D
	lb/day	—	—	—	8.37	—	16.2	D
Total Ammonia (June – Sept)	mg/L	—	—	—	1.67	—	4.14	D
	lb/day	—	—	—	5.57	—	13.8	D
Total Phosphorus (June – Sept)	µg/L	—	—	—	9.0	18.0	—	D
	lb/day	—	—	—	0.030	0.060	—	D

[a] NC = no change, I = increase, D = decrease.

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

Compliance Schedule

Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality-based effluent limits issued in a permit for the first time. The KPSD cannot immediately achieve compliance with the effluent limits for ammonia and phosphorus; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. This compliance schedule provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the permit. At the same time, the schedule ensures that compliance with the final effluent limits is accomplished as soon as possible. At the request of KPSD, this schedule allows time for a master planning effort and to implement the preferred option to achieving their new effluent limits. Options include but are not limited to a 65 acre expansion of their reuse site; construction of a mechanical treatment plant; significant upgrades to the existing lagoon system or regionalization with City of Sandpoint.

Each of these options requires considerable amounts of time to plan, fund and construct (May 20, 2016 email and May 26, 2015 letter from KPSD). Regionalization also requires close coordination with the City of Sandpoint and their new NPDES draft permit compliance schedule. To facilitate a coordinated effort between Sandpoint and KPSD to allow for regionalization to occur, their compliance schedules are closely aligned.

DEQ authorizes interim limits in Table 2 for a period of ten (10) years from the date of the final permit. The permittee must comply with all other effluent limitations beginning on the effective date of the permit. After ten years, final limits for ammonia and phosphorus shall be met.

Interim Requirements for Compliance Schedule

1. By one (1) year after the effective date of the final permit, a progress report shall be submitted to EPA and DEQ indicating that a master planning effort has been initiated.
2. By two (2) years after the effective date of the final permit, a progress report shall be submitted to EPA and DEQ indicating that master planning is underway and is on schedule to comply with these interim requirements.
3. By three (3) years after the effective date of the final permit, a master plan shall be submitted to EPA and DEQ for review and approval. The master plan shall identify a preferred alternative that will meet final effluent limits along with project phasing, financing strategy and implementation timeline.
4. By four (4) years after the effective date of the final permit, the permittee must provide EPA and DEQ with a progress report on funding for the preferred alternative. Copy of notice of bond approval or notice of judicial confirmation is acceptable.
5. By five (5) years after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that design has been completed and approved by DEQ.

6. By six (6) years after the effective date of the final permit, the permittee must provide EPA and DEQ with a notice that bids for construction have been awarded to achieve final effluent limitations.
7. By seven (7) and eight (8) years after the effective date of the final permit, the permittee must provide EPA and DEQ with brief progress reports of construction as they relate to meeting the compliance schedule timeline and final effluent limits.
8. By nine (9) years after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that construction has been substantively completed on the facilities to achieve final effluent limitations.
9. By ten (10) years after the effective date of the final permit, the permittee must provide EPA and DEQ with a written report providing details of a completed start up and optimization phase of the new treatment system (if applicable) and must achieve compliance with the final effluent limitations of Part I.B.

Table 2. Interim Limits

Parameter	Units	Monthly Total
Ammonia (June-September)	lb/month	1,168
Ammonia (October-May)	n/a	no effluent limit (monitor and report per permit)
Phosphorus (June-September)	lb/month	282
Phosphorus (October-May)	n/a	no effluent limit (monitor and report per permit)

Mixing Zones

The KPSD outfall discharges to a small tributary of Boyer Slough. The Boyer Slough watershed encompasses approximately 5,400 acres, the majority of which is sparsely populated farm land. Boyer Slough joins Pend Oreille Lake approximately 0.68 miles from the wastewater treatment plant outfall pipe. During the summer months, Pend Oreille Lake is held at an elevation of 2062' to 2062.5' for recreational use which creates a backwater effect in Boyer Slough that extends upstream almost to the outfall. During the rest of the year, Boyer Slough is a small shallow stream. Pursuant to IDAPA 58.01.02.060, DEQ authorizes the mixing zones summarized in Table 3. A justification for the nitrate + nitrite mixing zone in Boyer Slough has been provided to

DEQ by KPSD (May 20, 2016 email and May 26, 2015 letter from KPSD summarized in Appendix A).

Table 3. Mixing Zones for Final Permit Limits

Pollutant	Mixing Zone (% of critical flow volumes of Tributary Boyer Slough)
ammonia	25
chlorine	25
nitrate + nitrite	100*

*Mixing zone includes flow from the main stem of Boyer Slough.

Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to June Bergquist, Coeur d'Alene Regional Office at 208.666.4605 or via email at june.bergquist@deq.idaho.gov.

DRAFT

Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office

Appendix A
Justifications for the Ten Year Compliance Schedule
and
Nitrate + Nitrite 100% Mixing Zone

Justification for the Ten Year Compliance Schedule

The Idaho Water Quality Standards allow DEQ to authorize compliance schedules for water quality-based effluent limits when the limits are in the permit for the first time (IDAPA 58.01.02.400.03). The Clean Water Act requires compliance with effluent limits as soon as possible. To determine the length of time, DEQ requested information from Kootenai Ponderay Sewer District (KPSD) regarding what must happen at their facility in order to meet the new limits and how long this would take. As a result of discussions and written information, DEQ determined that a ten (10) year compliance schedule for KPSD is necessary to meet their new limits for ammonia and phosphorus. DEQ has summarized their justification information below:

KPSD operates a lagoon treatment plant providing equivalent secondary treatment. The draft permit contains first time effluent limits for ammonia and phosphorus. These effluent limits are substantially lower than that currently discharged. The facility does not have the oxygen transfer capacity necessary to meet ammonia oxidation requirements. To reliably remove ammonia additional facilities would be needed which may include one of the following options:

- Activated solids capture and recycle and increased aeration
- Fixed film unit process to retain biomass and increased aeration
- Chemical oxidation
- Move outfall location
- Eliminate surface water discharge

Any of these options would require a significant amount of capital investment and planning. A ten (10) year compliance schedule will allow sufficient time to master plan future needs and alternatives, coordinate with Sandpoint for a potential regional system, and generate and implement a funding plan.

The draft permit contains first time effluent limits for phosphorus. These phosphorus limits are substantially lower than currently discharged. The existing wastewater treatment plant does not have any unit process specific for the removal of phosphorus; therefore, the facility cannot reliably meet any phosphorus limit without significant upgrades and improvements. To reliably remove phosphorus the plant would need to upgrade to either:

- a biologically enhanced phosphorus removal treatment plant or
- a chemical precipitation/filtration treatment plant.

Both options would require millions of dollars and a significant planning and funding effort requiring ten years to accomplish. Additionally, if the District's planning effort determined that land application is the best way to meet the new phosphorus limit (no discharge in summer months) the district would need time to fully outfit their land application site which could include test plots to see which crops can grow in the available land.

A note of clarification: DEQ did not include interim effluent limits for October – May for either ammonia or phosphorus. The reason for this is that the existing lagoon system cannot reliably treat for either of these pollutants so setting a limit did not make sense. The summertime effluent limits for these pollutants encourage the facility to utilize their existing reuse site but allows for some periods of discharge during this time period for system maintenance, rainy weather, upgrades and other unanticipated conditions.

Justification for the Nitrate + Nitrite 100 % Mixing Zone

The Idaho Water Quality Standards require that DEQ evaluate the discharge to determine if a mixing zone could be considered (IDAPA 58.01.02.060). Mixing zones shall not cause unreasonable interference with, or danger to, beneficial uses. Nitrate and nitrite are pollutants significant to Boyer Slough's designated beneficial use for domestic water supply. This use was designated for Boyer Slough as part of a larger effort to consolidate and link the smaller tributaries with their receiving waters. As a result, Boyer Slough has the same designated beneficial uses as Pend Oreille Lake.

To determine if nitrate and nitrite are pollutants of concern for Boyer Slough, DEQ examined all water rights for Boyer Slough downstream of the wastewater outfall. There were no water rights for domestic water supply, only irrigation. Area drinking water systems of Oden Water Association that includes Whiskey Jack subdivision do not serve water drawn from Boyer Slough for drinking water. Sand-Ida Services draws irrigation water from Boyer Slough for their customers but this use is strictly for irrigation and delivered in purple pipe. Comments to DEQ regarding the Boyer Slough water for irrigation use are that it is good nutrient rich water that enhances landscaping vegetation. On the negative side, comments regarding Boyer Slough water were that it causes the luxuriant growth of rooted aquatic plants and suspended algae that makes it difficult to draw water from Boyer Slough at certain times of the year. This condition was captured in DEQ's 2015 assessment of uses that resulted in the determination that recreational uses are impaired (draft 2014 Integrated Report). Given this examination, DEQ concluded that no domestic water supply use exists downstream of the wastewater effluent outfall to the outlet of Boyer Slough. Domestic water supply use clearly exists in Pend Oreille Lake where nitrates and nitrites would be pollutants of concern. Granting of the 100% mixing zone would not change the existing conditions. There is no proposed increase in design flow for this facility, it remains at 0.4MGD and this is the flow used for calculating effluent limits.

Other uses that might be affected by a 100% nitrate + nitrite mixing zone are cold water aquatic life and specifically, salmonid species. To determine the effect these pollutants have on salmonid species, DEQ consulted the Water Quality Criteria for Water 1986 (EPA, 1986 "Gold Book"). This reference states, "In oxygenated natural water systems nitrite is rapidly oxidized to nitrate." Nitrites do occur in the effluent in concentrations that would be harmful to salmonid species; however as discussed, nitrites are an unstable form of nitrogen and quickly convert to nitrates in the aquatic environment. The concentration of nitrates protective of salmonids is much higher than that discharged by the treatment plant. So there is no unreasonable interference with or danger to cold water aquatic life and specifically salmonids if this mixing zone were authorized.

Recreational uses were also examined to determine if this size of mixing zone would interfere with activities such as swimming or fishing. In northern Idaho lakes, rivers and streams, phosphorus is most often the limiting nutrient that determines the level of aquatic plant

productivity. Reducing the concentration of nitrogen pollutants alone (thereby reducing the size of the mixing zone) is not likely to affect the current luxuriant growth of rooted aquatic plants or algae. Therefore, this mixing zone should have no adverse effect on recreational uses. However, the new final phosphorus limits in the draft permit should result in a significant reduction of macrophyte (submerged, emergent or floating aquatic plants) productivity during summer months.

Given the lack of an existing drinking water use, no adverse effects to cold water aquatic life species or recreational uses, DEQ authorized the 100% nitrate + nitrite mixing zone within Boyer Slough.